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

APPLICATION OF NGL WATER SOLUTIONS PERMIAN, LLC FOR APPROVAL OF SALT WATER DISPOSAL WELL IN LEA COUNTY, NEW MEXICO

Case No. 20575

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# Exhibit 1

## Neel Duncan Exhibits

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

**APPLICATION OF NGL WATER SOLUTIONS PERMIAN, LLC FOR APPROVAL OF SALT WATER DISPOSAL WELL IN LEA COUNTY, NEW MEXICO** **Case No. 20575**

**AFFIDAVIT OF NEEL DUNCAN**

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

I, Neel Duncan, 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 managing director of Integrated Petroleum Technologies, and I oversee drilling and operations of SWDs for NGL Water Solutions Permian, LLC in southeast New Mexico.

3. I have a bachelor's degree in petroleum engineering from Texas Tech University, and I have 35 years of experience working in the oil and gas industry both in the U.S. and internationally.

4. I have previously testified before the Division and have been qualified as an expert in saltwater disposal well drilling, operations and engineering matters.

5. I am familiar with the application that NGL Water Solutions Permian, LLC ("NGL") has filed in this matter.

6. The applicant, NGL (OGRID No. 372338), seeks an order approving a saltwater disposal well known as the Ghost Rider SWD #1 that will inject approximately 50,000 bbls per

day of salt water into the Devonian-Fussleman-Siluran group. The application and the C-108 and backup documentation are attached to this Affidavit.

7. NGL retained Lonquist & Co., LLC to conduct a review of the county records and compile a list of parties entitled to notice. Although the Divisions rules only require notice to parties located within half a mile radius of the proposed well location, NGL provided notice to parties within a one-mile radius. NGL also published notice in the Hobbs News Sun.

8. The C-108 was prepared by Lonquist, with the well design provided by Integrated Petroleum Technologies.

9. There are no existing SWDs within 1.5 miles of the proposed location of the Ghost Rider well. There is one application for a SWD that is located 1.5 miles away, and that is NGL's Thunderbolt well. The next the nearest proposed wells are NGL applications for the Hornet, Galaxy, and Raptor wells, which are all located more than 5 miles away from the Ghost Rider location.

10. As part of its application, NGL is requesting to use a tubing size of 7-inch by 5½-inch tapered string. This larger tubing size has a number of benefits. It significantly reduces friction in the tubing and increases the ability to inject more fluid into the formation. The more water that is injected per well, the fewer number of wells that are needed to meet industry demands in our areas of development. This reduces costs and also results in less surface impact and fewer emissions.

11. The use of larger tubing will not impact the ability to conduct fishing operations in the well in the event parted tubing must be retrieved.

12. The Division has previously approved the use of 7-inch by 5½-inch for other Devonian disposal wells, including applications by NGL, Mesquite, and OWL.

13. I oversaw the work of Scott Wilson, Dr. Kate Zeigler, Dr. Steven Taylor, and Todd Reynolds in connection with this application. These technical experts were retained to ensure that the drilling and operation of the well would not impact groundwater resources, would protect correlative rights, would minimize the risk of induced seismicity, and the injection would be confined to the Devonian injection interval requested in the C-108.

14. Each of these witnesses has previously testified before the Division and their qualifications have been accepted.

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

16. It is my opinion that the granting of these applications is in the interests of conservation and the prevention of waste.

*[Signature page follows]*

Neel Duncan

SUBSCRIBED AND SWORN to before me this 13th day of June, 2019 by Neel Duncan.

Notary Public

My commission expires: 8/11/21

Official Seal
MARSHA E DALTON
Notary Public
State of New Mexico
My Comm. Expires 8/11/21

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

**APPLICATION OF NGL WATER SOLUTIONS PERMIAN, LLC FOR APPROVAL OF SALT WATER DISPOSAL WELL IN LEA COUNTY, NEW MEXICO** **Case No. _____**

## APPLICATION

NGL Water Solutions Permian, LLC ("NGL"), OGRID No. 372338, through its undersigned attorneys, hereby makes this application to the Oil Conservation Division pursuant to the provisions of NMSA 1978, Section 70-2-12, for an order approving drilling of a salt water disposal well in Lea County, New Mexico. In support of this application, NGL states as follows:

1. NGL proposes to drill the Ghost Rider SWD #1 well at a surface location 1,585 feet from the South line and 270 feet from the East line of Section 30, Township 26 South, Range 35 East, NMPM, Lea County, New Mexico for the purpose of operating a salt water disposal well.

2. NGL seeks authority to inject salt water into the Silurian-Devonian formation at a depth of 18,953' to 20,729'.

3. NGL further seeks approval of the use of 7 inch tubing inside the surface and intermediate casings and 5½ 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. NGL anticipates using an average pressure of 2,843 psi for this well, and it requests that a maximum pressure of 3,790 psi be approved for the well.

5. A proposed C-108 for the subject well is attached hereto as Exhibit A.

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

WHEREFORE, NGL requests that this application be set for hearing before an Examiner of the Oil Conservation Division on June 13, 2019; and that after notice and hearing, the Division enter its order approving this application.

Respectfully submitted,

ABADIE & SCHILL, P.C.

By: _____

Lara Katz
Darin C. Savage
214 McKenzie Street
Santa Fe, New Mexico 87501
(970) 385-4401
lara@abadieschill.com
darin@abadieschill.com

*Attorneys for NGL Water Solutions Permian, LLC*

**CASE NO. _____: Application of NGL Water Solutions Permian, LLC for approval of salt water disposal well in Lea County, New Mexico.** Applicant seeks an order approving disposal into the Silurian-Devonian formation through the Ghost Rider SWD #1 well at a surface location 1,585 feet from the South line and 270 feet from the East line of Section 30, Township 26 South, Range 35 East, NMPM, Lea County, New Mexico for the purpose of operating a salt water disposal well. NGL seeks authority to inject salt water into the Silurian-Devonian formation at a depth of 18,953' to 20,729'. NGL further seeks approval of the use of 7 inch tubing inside the surface and intermediate casings and 5½ 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. Said location is 11.7 miles Southwest of Bennett, New Mexico.

Revised March 23, 2017

| RECEIVED: | REVIEWER: | TYPE: | APP NO: |
|---|---|---|---|

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:** NGL WATER SOLUTIONS PERMIAN LLC **OGRID Number:** 372338
**Well Name:** GHOST RIDER SWD #1 **API:** TBD
**Pool:** SWD; DEVONIAN-SILURIAN **Pool Code:** 97869

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

1) **TYPE OF APPLICATION:** Check those which apply for [A]
A. Location – Spacing Unit – Simultaneous Dedication
☐ NSL ☐ NSP (PROJECT AREA) ☐ NSP (PRORATION UNIT) ☐ SD

B. Check one only for [ I ] or [ II ]
[ I ] Commingling – Storage – Measurement
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM
[ II ] Injection – Disposal – Pressure Increase – Enhanced Oil Recovery
☐ WFX ☐ PMX ☒ SWD ☐ IPI ☐ EOR ☐ PPR

**FOR OCD ONLY**
☐ Notice Complete
☐ Application Content Complete

2) **NOTIFICATION REQUIRED TO:** Check those which apply.
A. ☒ Offset operators or lease holders
B. ☒ Royalty, overriding royalty owners, revenue owners
C. ☒ Application requires published notice
D. ☒ Notification and/or concurrent approval by SLO
E. ☒ Notification and/or concurrent approval by BLM
F. ☒ Surface owner
G. ☐ For all of the above, proof of notification or publication is attached, and/or,
H. ☐ No notice required

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

4/23/2019
Date

512-600-1764
Phone Number

CHRIS@LONQUIST.COM
e-mail Address

EXHIBIT
tabbies
1

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: NGL WATER SOLUTIONS PERMIAN, LLC

ADDRESS: 1509 W WALL ST // STE 306 // MIDLAND, TX 79701

CONTACT PARTY: SARAH JORDAN PHONE: (432) 685-0005 x1989

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: 4/23/2019

E-MAIL ADDRESS: chris@lonquist.com

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstances of the earlier submittal: _____

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

Side 2

III. WELL DATA

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

(1) Lease name; Well No.; Location by Section, Township and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

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

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

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

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

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

(1) The name, address, phone number, and contact party for the applicant;

(2) The intended purpose of the injection well; with the exact location of single wells or the Section, Township, and Range location of multiple wells;

(3) The formation name and depth with expected maximum injection rates and pressures; and,

(4) A notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, within 15 days.

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

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

Side 1

# INJECTION WELL DATA SHEET

OPERATOR: NGL WATER SOLUTIONS PERMIAN, LLC

WELL NAME & NUMBER: GHOST RIDER SWD #1

WELL LOCATION: 1,585' FSL & 270' FEL | I | 30 | 26S | 35E

FOOTAGE LOCATION | UNIT LETTER | SECTION | TOWNSHIP | RANGE

***WELLBORE SCHEMATIC***

***WELL CONSTRUCTION DATA***

Surface Casing

Hole Size: 24.000"

Casing Size: 20.000"

Cemented with: 1,993 sx. *or* _____ $ft^3$

Top of Cement: Surface

Method Determined: Circulation

1st Intermediate Casing

Hole Size: 17.500"

Casing Size: 13.375"

Cemented with: 3,285 sx. *or* _____ $ft^3$

Top of Cement: Surface

Method Determined: Circulation

2nd Intermediate Casing

Hole Size: 12.250"

Casing Size: 9.625"

Cemented with: 3,249 sx. *or* _____ $ft^3$

Top of Cement: Surface

Method Determined: Circulation

Production Liner

Hole Size: 8.500"

Casing Size: 7.625"

Cemented with: 356 sx.

*or* _____ $ft^3$

Top of Cement: 12,400'

Method Determined: Calculation

Total Depth: 20,729'

Injection Interval

18,953 feet to 20,729 feet

(Open Hole)

## INJECTION WELL DATA SHEET

Tubing Size: 7", 26 lb/ft, P-110, TCPC from 0'- 12,300' and 5.500", 17 lb/ft, P-110 TCPC from 12,300' - 18,903'
Lining Material: Duoline

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

Packer Setting Depth: 18,903'

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

Additional Data

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

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

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

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

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

5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area:
   Delaware: 5,340'
   Bone Spring: 9,306'
   Wolfcamp: 12,804'
   Strawn: 14,488'
   Atoka: 15,006'
   Morrow: 15,564'

Energy Partners LP

# NGL Ghost Rider SWD #1

**Location** - Sec. 30 R26S T35E
Lea County, NM

**AFE Number**

**TD - 20,729'**

**Directions to Site:** From Jal, NM - Head South on NM-205 S (Frying Pan Road). Travel 6.8 miles and turn right (W) onto Beckham Rd. Continue on Beckham Road for 2.3 miles (past house on right). Location will be on the right (SE) side.

**Vertical Injection - Devonian, Silurian, Fusselman**

**Rig - ??**

**Estimated Drilling Cost**

**GL/KB - 3172'/3192'**

**Lat/Long:** 32.01281/-103.40131

| Geologic Tops (MD ft) | Section | Problems | Bit/BHA | Mud | Casing | Logging | Cement (HOLD) | Injection String |
|---|---|---|---|---|---|---|---|---|
| Triassic - 25'<br>Rustler Anhydrite - 1,034'<br>Base of Silicates 1,581'<br>**Surface TD - 1,750'** | **Surface**<br>Drill 24"<br>0' - 1750'<br>Set and Cement 20" Casing | Loss Circulation<br>Hole Cleaning<br>Wellbore stability in the Red Beds<br>Anhydrite in the Rustler | 24" PDC Bit + 9-5/8" X 8" 7/8 4.0 Combo MM w/17" NBS + 1X8" DC + 17" IBS + 1X8" DC + SS + 4X8" DC's + X/O +5" HWDP | Spud Mud<br>MW< 9.0 | 1750' of 20" 133# J55 BTC<br>Centralizers - bottom 2 joints and every 3rd jt thereafter, Cement basket 5th jt from surface | Mud loggers on site by Drillout of Surf. | **LEAD:** 741 sx of 13.7 ppg EXTANDACEM, 1.694 ft3/sk @ 75% Excess<br>(750' of fill)<br>**TAIL:** 1252 sx of 14.8 ppg HALCEM, 1.342 ft3/sk @ 75% Excess<br>(1000' of fill) | |
| Top of Salt - 1,806'<br>**1st Int. DV Tool - 1,850'**<br>Castile - 2,816'<br>Base Salt - 4,788'<br>**1st Int TD - 5,300'** | **1st Intermediate**<br>Drill 3550' of 17-1/2" Hole<br>1750' - 5300'<br>Set and Cement 13-3/8" Casing in 2 Stages | Seepage Losses<br>Possible H2S<br>Anhydrite<br>Salt Sections | 17-1/2" Varel PDC Bit + 9-5/8"X 8" 7/8 4.0 Combo MM w/ 17" Steel NBS + 17" IBS + 2X8" DC's + Thruster + 4X8" DC's + 18X6" DC's + X/O + HWDP | Brine Water<br>MW 10-10.5 | 5300' of 13-3/8" 68# HCL80 BTC<br>5M A Section Casing Bowl<br>Centralizers - bottom jt, every 3rd joint in open hole and 2 jt inside the surface casing | Gyro Survey | **Stage 2:** 1128 sx of 13.7 ppg HALCEM, 1.747 ft3/sk @ 50% Excess<br>(0' - 1850')<br>**Stage 1:** 2157 sx of 13.7 ppg HALCEM, 1.777 ft3/sk @ 50% Excess<br>(1850' - 5300') | 12300' of 7" P110 26# TCPC |
| Delaware Mtn Group - 5,340'<br>Lamar Limestone - 5,343'<br>Bell Canyon - 5,378'<br>**2nd Int. DV Tool/ACP - 5,400'**<br>Cherry Canyon - 6,588'<br>Brushy Canyon - 7,823'<br>**2nd Int. DV Tool - 9,000'**<br>Bone Spring - 9,306'<br>**3rd Int Liner Top - 12,400'**<br>Wolfcamp - 12,804'<br>**2nd Int TD - 12,900'** | **2nd Intermediate**<br>Drill 7600' of 12-1/4" Hole<br>5300' - 12900'<br>Set 9-5/8" Intermediate Casing and Cement in 3 Stages | Hard Drilling in the Brushy Canyon (watch for stick-slip)<br>Seepage to Complete Losses/ Water Flows in DMG<br>Some Anhydrite and H2S possible<br>Production in the Bone Spring and Wolfcamp<br>Ballooning is possible in Cherry Canyon and Brushy if Broken Down | 12-1/4" Smith XS 716S AxeBlade PDC Bit, sub, 8" 7/8 4.0 0.16 MM w/ 12" NBS, ALS Roller Reamer DeMag , UBHO sub, ALS 12" RR/UBHO/NMDC, 6 jts: 8" DC, X/O sub, 18 jts: 6" DC, X/O sub, 8" Drilling Jars HWDP + 5" DP to Surface | Freshwater<br>MW 8.6 - 9.2<br>High visc. Sweeps and mud up for tight spots (<10 FL, 30-35 visc.) | 10M B Section<br>12,900' of 9-5/8" 53.5# HCP110 BTC<br>**Special Drift to 8.535"**<br>**Externally Coat 3600' Between DV Tools**<br>**DV Tool at at 9000'**<br>**ECP/DV Tool @ top of loss zones (HOLD)**<br>Centralizers - bottom jt, 100' aside of DV tool, every 3rd joint in open hole and 5 within the surface casing | **12.25" Open Hole:**<br>MWD GR<br>Triple combo, Caliper , CBL of 13-3/8" Casing to surface<br>**Cased Hole:** CBL/Pressure pass to 1000 psi **IF** cement is not circulated on 2nd and 3rd Stages | **Stage 3:**<br>1120 sx of 13.7 ppg HALCEM, 1.777 ft3/sk @ 10% Excess<br>(Upper DV Tool to Surface)<br>**Stage 2:**<br>827 sx of 11.9 ppg HALCEM, 1.713 ft3/sk @ 50% Excess<br>(Between Upper and Lower DVT)<br>**Stage 1:**<br>1302 sx of 15.6 ppg HALCEM, 1.232 ft3/sk @ 30% Excess<br>(TD to Lower DVT) | 6603' of 5-1/2" P110 17# TCPC<br>Duoline Internally Coated Injection Tubing |
| Penn - 13,206'<br>Strawn - 14,488'<br>Atoka - 15,006'<br>Morrow - 15,564'<br>Miss Lst - 16,654'<br>Woodford - 18,659'<br>**Perm Packer - 18,903'**<br>**3rd Int TD - 18,953'** | **3rd Intermediate**<br>Drill 6053' of 8-1/2" Hole<br>12900' - 18953'<br>Set 7-5/8" Liner and Cement in Single Stage | High Pressure (up to 15ppg) and wellbore instability (fracturing) expected in the Atoka<br>Production in the Wolfcamp Atoka and Morrow<br>Hard Drilling in the Morrow Clastic | 8-1/2" Smith XS 716S AxeBlade PDC Bit, sub, 6-3/4" 7/8 5.7 MM w/ 8" NBS, UBHO sub, 8" NMIBS/UBHO/NMDC, Thruster, 18 jts: 6" DC 6" Drilling Jars HWDP + 5" DP to Surface | AES-VERT OBM<br>MW 13.0-14.5<br>UBD/MPD using ADA | 6553' of 7-5/8" 39# HCV150 USS Liberty FJM<br>Centralizers on and 1 jt above shoe jt and then every 2nd jt. | **8.5" Open Hole:**<br>MWD GR<br>Triple combo, Caliper of 8.5" Open Hole/CBL of 9-5/8" Casing<br>**Cased Hole:** SCBL/Pressure Pass to 1000 psi of 7-5/8" Liner before drillout | **LEAD:** 209 sx of 11.9 ppg HALCEM, 2.053 ft3/sk @ 20% Excess over caliper volume or 25%<br>(17953' - 12400')<br>**TAIL:** 147 sx of 13.2 ppg HALCEM, 1.439 ft3/sk @ 20% Excess over caliper volume or 25%<br>(2000' of fill) | 7-5/8" x 5-1/2" TCPC Permanent Packer with High Temp Elastomer and full Inconel 925 trim |
| **Devonian - 18,953'**<br>**Silurian - 19,954'**<br>**Fusselman - 20,224'**<br>**Montoya - 20,629'**<br>**TD - 20,729'** | **Injection Interval**<br>Drill 1910' of 6-1/2" hole<br>18953' to 20729' | Chert is possible<br>Loss of Circulation is expected<br>BHT estimated at 280F | 6-1/2" Smith U611S PDC Bit, sub, 5" 7/8 2.6 0.26 1.5FBH MM w/ 6" NBS, 6" NMIBS, UBHO/NMDC, Thruster, X/O sub, 24 jts: 4-3/4" HWDP + 4" DP to Surface | Cut Brine - low grav for possible losses | Openhole completion | MWD GR<br>Triple Combo with FMI + CBL of 7-5/8" | Displace with 3% KCl (or heavier brine if necessary) | |

**NGL Water Solutions Permian, LLC**

**Ghost Rider SWD No. 1**

**FORM C-108 Supplemental Information**

III. Well Data

A. Wellbore Information

1.

| Well information | |
|---|---|
| **Lease Name** | Ghost Rider SWD |
| **Well No.** | 1 |
| **Location** | S-30 T-26S R-35E |
| **Footage Location** | 1,585' FSL & 270' FEL |

2.

a. Wellbore Description

| Casing Information | | | | |
|---|---|---|---|---|
| **Type** | Surface | Intermediate | Production | Liner |
| **OD** | 20" | 13.375" | 9.625" | 7.625" |
| **WT** | 0.635" | 0.480" | 0.545" | 0.500" |
| **ID** | 18.730" | 12.415" | 8.535" | 6.625" |
| **Drift ID** | 18.542" | 12.259" | 8.535" | 6.500" |
| **COD** | 21.00" | 14.375" | 10.625" | 8.500" |
| **Weight** | 133 lb/ft | 68 lb/ft | 53.5 lb/ft | 39 lb/ft |
| **Grade** | J-55 | HCL-80 | HCP-110 | HCV-150 |
| **Hole Size** | 24" | 17.5" | 12.25" | 8.5" |
| **Depth Set** | 1,750' | 5,300' | 12,900' | 18,953' |

b. Cementing Program

| Cement Information | | | | |
|---|---|---|---|---|
| **Casing String** | Surface | Intermediate | Production | Liner |
| **Lead Cement** | Extenda Cem | Halcem | Halcem | Halcem |
| **Lead Cement Volume** | 741 | 3,285 | Stage 1: 1,302 sks<br>Stage 2: 827 sks<br>Stage 3: 1,120 sks | 209 |
| **Tail Cement** | Halcem | | | Halcem |
| **Tail Cement Volume** | 1,252 | | | 147 |
| **Cement Excess** | 75% | 50% | 30%,50%,10% | 25% |
| **TOC** | Surface | Surface | Surface | 12,400' |
| **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'-12,300' | 12,300' -18,903' |

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

B. Completion Information

1. Injection Formation: Devonian, Silurian, Fusselman, Montoya (Top 100')
2. Gross Injection Interval: 18,953' – 20,729'

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 | 5,340' |
| Bone Spring | 9,306' |
| Wolfcamp | 12,804' |
| Strawn | 14,488' |
| Atoka | 15,006' |
| Morrow | 15,564' |

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: 2,843 PSI (surface pressure)
   Maximum Injection Pressure: 3,790 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 Avalon, Bone Spring, Delaware and Wolfcamp formations. Attached are produced water sample analyses taken from the closest wells that feature samples from the Avalon, Bone Spring, Delaware, 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 Anhydrite | 1,034' |
| Castile | 2,816' |
| Delaware | 5,340' |
| Bone Spring | 9,306' |
| Wolfcamp | 12,804' |
| Penn | 13,206' |
| Atoka | 15,006' |
| Morrow | 15,564' |
| Mississippian Lime | 16,654' |
| Woodford | 18,659' |
| Devonian | 18,953' |
| Silurian | 19,954' |
| Fusselman | 20,224' |
| Montoya | 20,629' |

B. Underground Sources of Drinking Water

Within 1-mile of the proposed Ghost Rider SWD #1 location, there are no water wells. Water wells in the surrounding area have an average depth of 400 ft and an average water depth of 240 ft generally producing from the Santa Rosa. The upper Rustler may also be another USDW and will be protected.

IX. Proposed Stimulation Program

Stimulate with up to 50,000 gallons of acid.

X. Logging and Test Data on the Well

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

XI. Chemical Analysis of Fresh Water Wells

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

XII. Affirmative Statement of Examination of Geologic and Engineering Data

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

NAME: John C. Webb

TITLE: Sr. Geologist

SIGNATURE: John C Webb

DATE: Nov. 1 2018

**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 and Natural Resources**
**Oil Conservation Division**
**1220 South St. Francis Dr.**
**Santa Fe, NM 87505**

Form C-101
Revised July 18, 2013

☐ AMENDED REPORT

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

| 1. Operator Name and Address | 2. OGRID Number |
|---|---|
| NGL WATER SOLUTIONS PERMIAN, LLC<br>1509 W WALL ST, STE 306<br>MIDLAND, TX 79701 | 372338 |
| | 3. API Number<br>TBD |

| 4. Property Code | 5. Property Name | 6. Well No. |
|---|---|---|
| | GHOST RIDER SWD | 1 |

## 7. Surface Location

| UL - Lot | Section | Township | Range | Lot Idn | Feet from | N/S Line | Feet From | E/W Line | County |
|---|---|---|---|---|---|---|---|---|---|
| I | 30 | 26S | 35E | N/A | 1585' | SOUTH | 270' | EAST | LEA |

## 8. Proposed Bottom Hole Location

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

## 9. Pool Information

| Pool Name | Pool Code |
|---|---|
| SWD; Devonian-Silurian | 97869 |

## Additional Well Information

| 11. Work Type | 12. Well Type | 13. Cable/Rotary | 14. Lease Type | 15. Ground Level Elevation |
|---|---|---|---|---|
| N | SWD | R | Private | 3,175' |
| **16. Multiple** | **17. Proposed Depth** | **18. Formation** | **19. Contractor** | **20. Spud Date** |
| N | 20,729' | Siluro-Devonian | TBD | ASAP |

| Depth to Ground water | Distance from nearest fresh water well | Distance to nearest surface water |
|---|---|---|
| 240' | > 1 mile | > 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" | 133 lb/ft | 1,750' | 1,993 | Surface |
| Intermediate | 17.5" | 13.375" | 68 lb/ft | 5,300' | 3,285 | Surface |
| Production | 12.25" | 9.625" | 53.5 lb/ft | 12,900' | 3,249 | Surface |
| Prod. Liner | 8.5" | 7.625" | 39 lb/ft | 18,953' | 356 | 12,400' |
| Tubing | N/A | 7" | 26 lb/ft | 0' – 12,300' | N/A | N/A |
| Tubing | N/A | 5.5" | 17 lb/ft | 12,300' – 18,903' | N/A | N/A |

## 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.<br>**I further certify that I have complied with 19.15.14.9 (A) NMAC ☐ and/or 19.15.14.9 (B) NMAC ☒, if applicable.**<br>Signature: | OIL CONSERVATION DIVISION |
|---|---|
| | Approved By: |
| Printed name: Christopher B. Weyand | Title: |
| Title: Consulting Engineer | Approved Date: / Expiration Date: |
| E-mail Address: chris@lonquist.com | |
| Date: 04/22/2019 / Phone: (512) 600-1764 | Conditions of Approval Attached |

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
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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 |
|---|---|---|
| | 97869 | SWD; Devonian-Silurian |

| [4] Property Code | [5] Property Name | [6] Well Number |
|---|---|---|
| | GHOST RIDER SWD | 1 |

| [7] OGRID No. | [8] Operator Name | [9] Elevation |
|---|---|---|
| 372558 | NGL WATER SOLUTIONS PERMIAN, LLC | 3175.00"± |

## [10] Surface Location

| UL or lot no. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| I | 30 | 26 S | 35 E | N/A | 1585' | SOUTH | 270' | EAST | LEA |

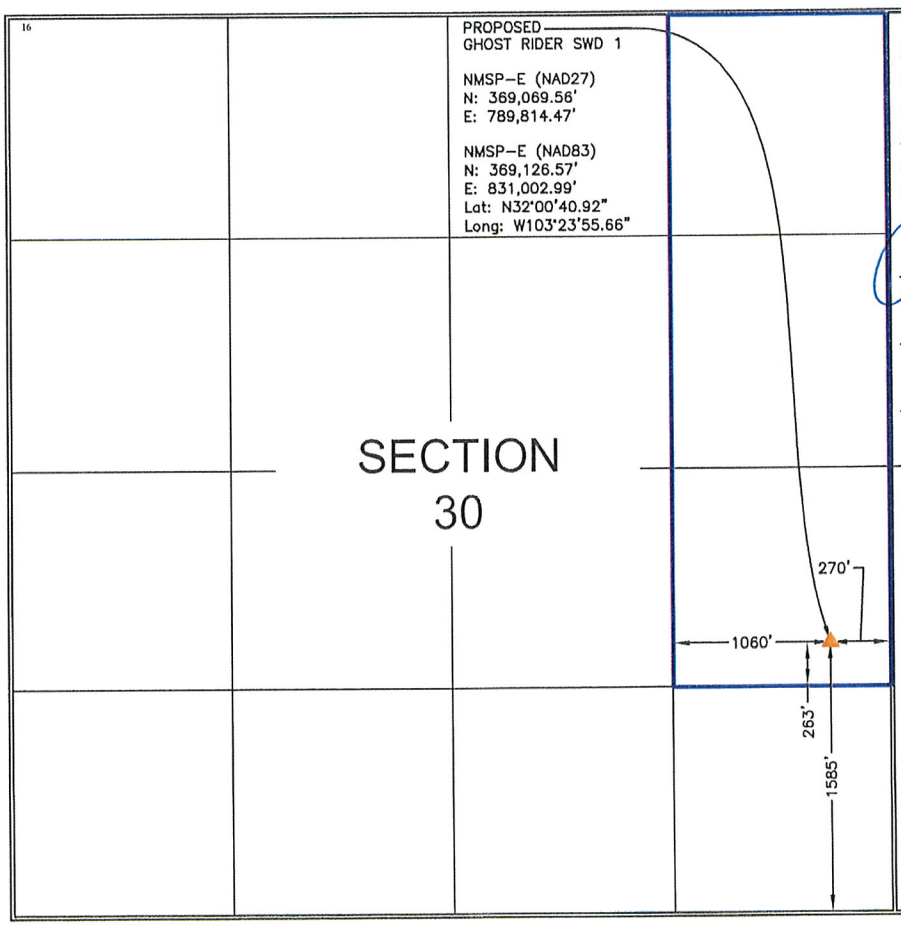
## [11] Bottom Hole Location If Different From Surface

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

| [12] Dedicated Acres | [13] Joint or Infill | [14] Consolidation Code | [15] Order No. |
|---|---|---|---|
| | | | |

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

[16]




## [17] OPERATOR CERTIFICATION

*I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.*

Signature — Date: 4/23/2019

Chris Weyand
Printed Name

chris@lonquist.com
E-mail Address

## [18] SURVEYOR CERTIFICATION

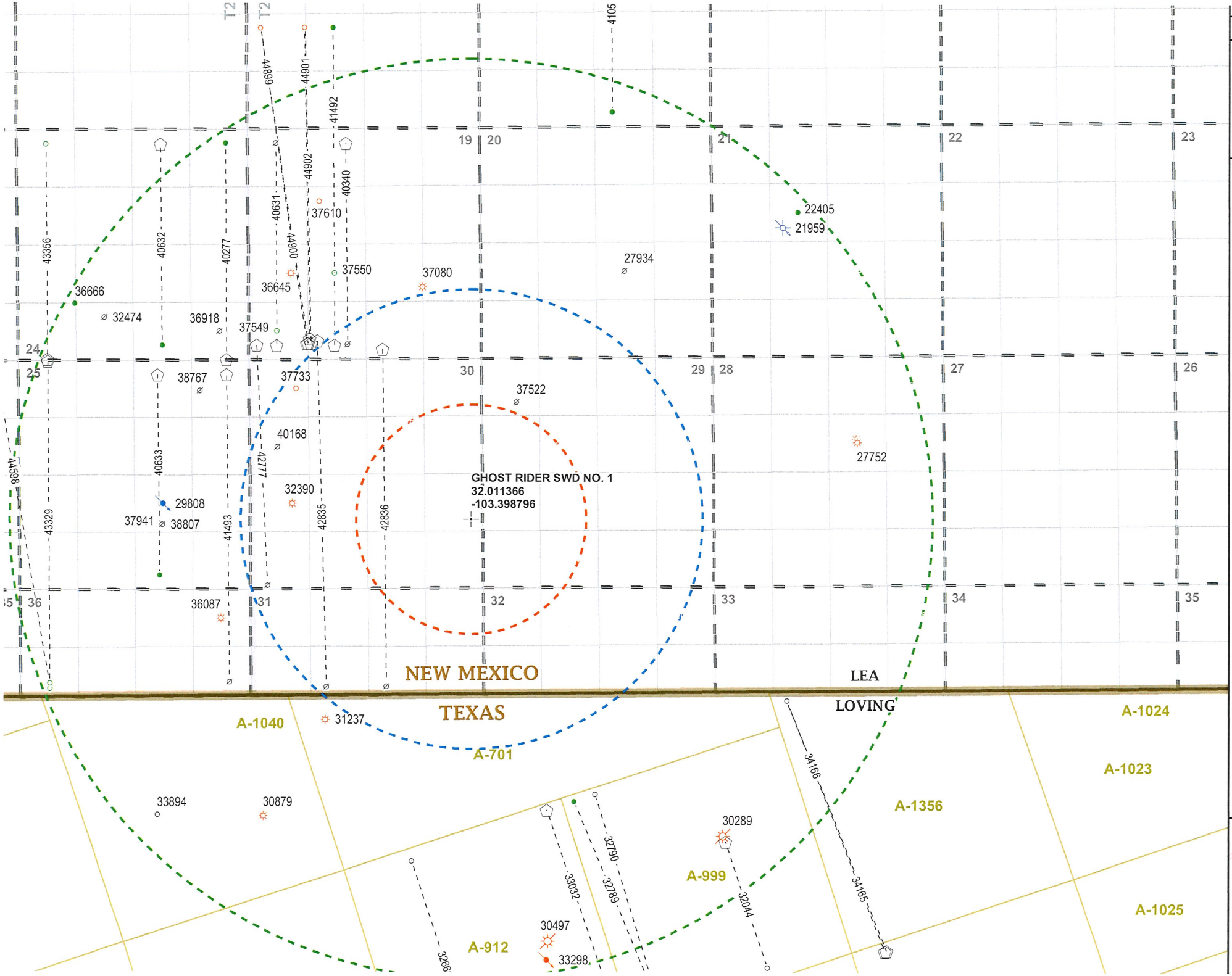
*I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.*

02/07/19
Date of Survey

Signature and Seal of Professional Surveyor

Billy W. Barr Jr. NEW MEXICO 25114 PROFESSIONAL SURVEYOR

25114
Certificate Number


GHOST RIDER SWD NO. 1
32.011366
-103.398796
NEW MEXICO
TEXAS
LEA
LOVING
A-1040
A-701
A-912
A-999
A-1356
A-1023
A-1024
A-1025
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21959
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37733
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27752
40168
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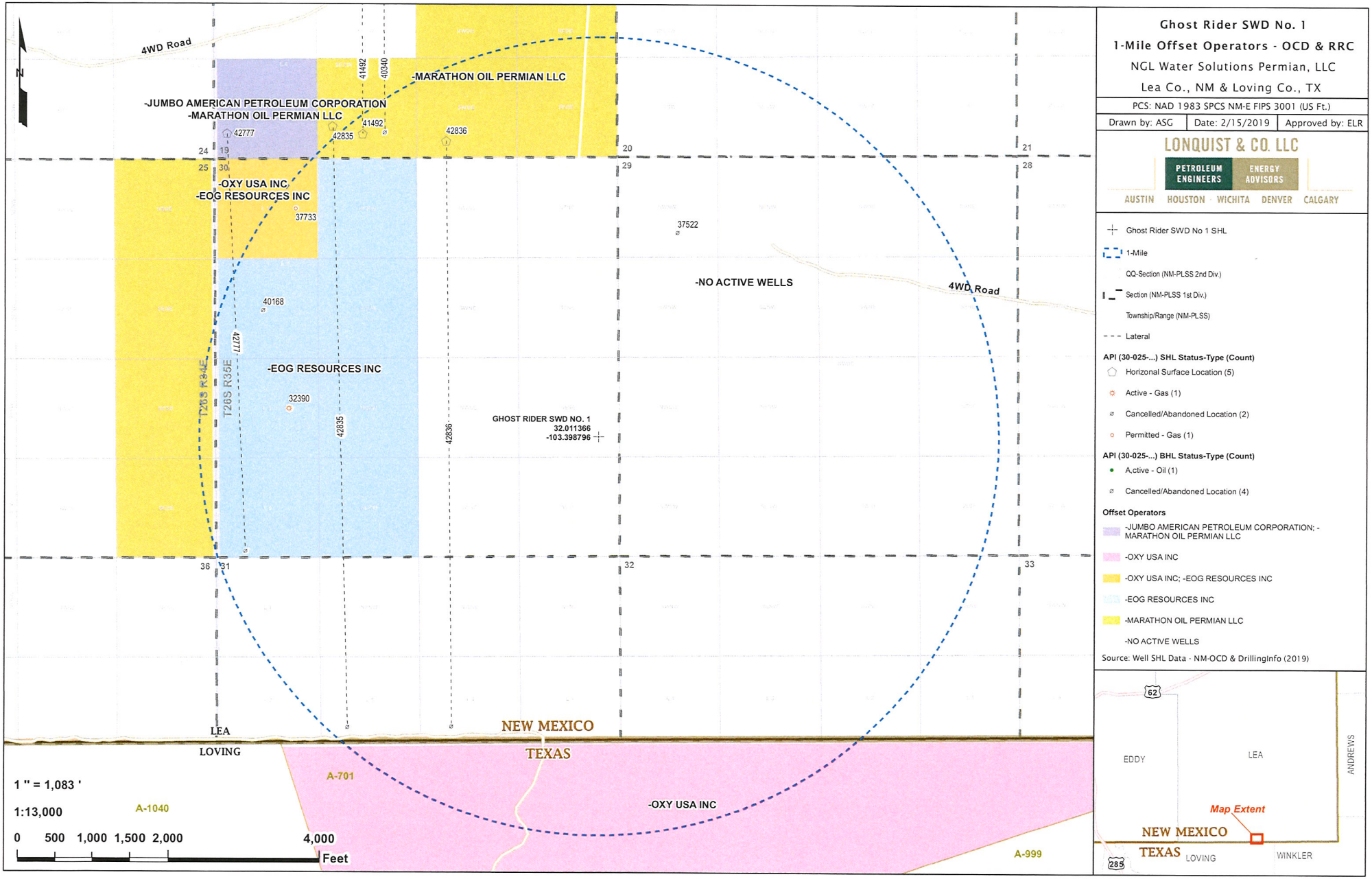
33894
30879
30289
30497
33298
API (30
API (30
Source
Draw




Ghost Rider SWD No. 1

1-Mile Offset Operators - OCD & RRC

NGL Water Solutions Permian, LLC

Lea Co., NM & Loving Co., TX

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

| Drawn by: ASG | Date: 2/15/2019 | Approved by: ELR |
|---|---|---|

LONQUIST & CO. LLC

PETROLEUM ENGINEERS | ENERGY ADVISORS

AUSTIN · HOUSTON · WICHITA · DENVER · CALGARY

- Ghost Rider SWD No 1 SHL
- 1-Mile
- QQ-Section (NM-PLSS 2nd Div.)
- Section (NM-PLSS 1st Div.)
- Township/Range (NM-PLSS)
- Lateral

**API (30-025-...) SHL Status-Type (Count)**

- Horizonal Surface Location (5)
- Active - Gas (1)
- Cancelled/Abandoned Location (2)
- Permitted - Gas (1)

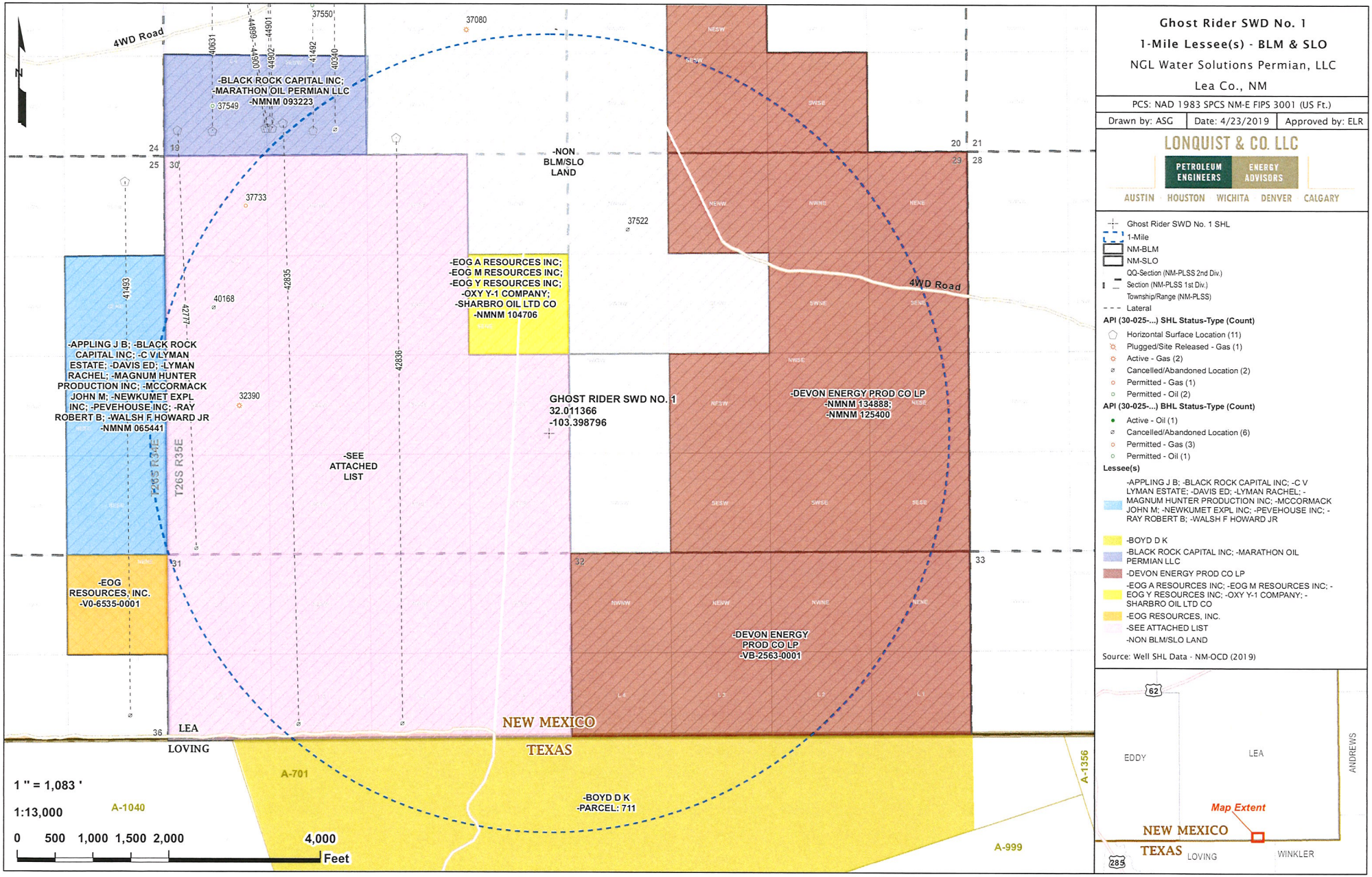
**API (30-025-...) BHL Status-Type (Count)**

- Active - Oil (1)
- Cancelled/Abandoned Location (4)

**Offset Operators**

- -JUMBO AMERICAN PETROLEUM CORPORATION; -MARATHON OIL PERMIAN LLC
- -OXY USA INC
- -OXY USA INC; -EOG RESOURCES INC
- -EOG RESOURCES INC
- -MARATHON OIL PERMIAN LLC
- -NO ACTIVE WELLS

Source: Well SHL Data - NM-OCD & DrillingInfo (2019)


Ghost Rider SWD No. 1
1-Mile Lessee(s) - BLM & SLO
NGL Water Solutions Permian, LLC
Lea Co., NM
PCS: NAD 1983 SPCS NM-E FIPS 3001 (US Ft.)
Drawn by: ASG
Date: 4/23/2019
Approved by: ELR
LONQUIST & CO. LLC
PETROLEUM ENGINEERS
ENERGY ADVISORS
AUSTIN HOUSTON WICHITA DENVER CALGARY
4WD Road
-BLACK ROCK CAPITAL INC; -MARATHON OIL PERMIAN LLC -NMNM 093223
-NON BLM/SLO LAND
-EOG A RESOURCES INC; -EOG M RESOURCES INC; -EOG Y RESOURCES INC; -OXY Y-1 COMPANY; -SHARBRO OIL LTD CO -NMNM 104706
-APPLING J B; -BLACK ROCK CAPITAL INC; -C V LYMAN ESTATE; -DAVIS ED; -LYMAN RACHEL; -MAGNUM HUNTER PRODUCTION INC; -MCCORMACK JOHN M; -NEWKUMET EXPL INC; -PEVEHOUSE INC; -RAY ROBERT B; -WALSH F HOWARD JR -NMNM 065441
GHOST RIDER SWD NO. 1
32.011366
-103.398796
-DEVON ENERGY PROD CO LP -NMNM 134888; -NMNM 125400
-SEE ATTACHED LIST
-EOG RESOURCES, INC. -V0-6535-0001
-DEVON ENERGY PROD CO LP -VB-2563-0001
T26S R34E
T26S R35E
LEA
LOVING
NEW MEXICO
TEXAS
A-701
A-1040
A-999
A-1356
-BOYD D K -PARCEL: 711
1 " = 1,083 '
1:13,000
0 500 1,000 1,500 2,000
4,000
Feet
Ghost Rider SWD No. 1 SHL
1-Mile
NM-BLM
NM-SLO
QQ-Section (NM-PLSS 2nd Div.)
Section (NM-PLSS 1st Div.)
Township/Range (NM-PLSS)
Lateral
API (30-025-...) SHL Status-Type (Count)
Horizontal Surface Location (11)
Plugged/Site Released - Gas (1)
Active - Gas (2)
Cancelled/Abandoned Location (2)
Permitted - Gas (1)
Permitted - Oil (2)
API (30-025-...) BHL Status-Type (Count)
Active - Oil (1)
Cancelled/Abandoned Location (6)
Permitted - Gas (3)
Permitted - Oil (1)
Lessee(s)
-APPLING J B; -BLACK ROCK CAPITAL INC; -C V LYMAN ESTATE; -DAVIS ED; -LYMAN RACHEL; -MAGNUM HUNTER PRODUCTION INC; -MCCORMACK JOHN M; -NEWKUMET EXPL INC; -PEVEHOUSE INC; -RAY ROBERT B; -WALSH F HOWARD JR
-BOYD D K
-BLACK ROCK CAPITAL INC; -MARATHON OIL PERMIAN LLC
-DEVON ENERGY PROD CO LP
-EOG A RESOURCES INC; -EOG M RESOURCES INC; -EOG Y RESOURCES INC; -OXY Y-1 COMPANY; -SHARBRO OIL LTD CO
-EOG RESOURCES, INC.
-SEE ATTACHED LIST
-NON BLM/SLO LAND
Source: Well SHL Data - NM-OCD (2019)
EDDY
LEA
ANDREWS
Map Extent
NEW MEXICO
TEXAS
LOVING
WINKLER
62
285

# Exhibit 2

## Scott Wilson Exhibits

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

**APPLICATION OF NGL WATER SOLUTIONS PERMIAN, LLC FOR APPROVAL OF SALT WATER DISPOSAL WELL IN LEA COUNTY, NEW MEXICO** **Case No. 20575**

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

4. I am familiar with the application that NGL Water Solutions Permian, LLC ("NGL") 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. Copies of my study are attached hereto as Exhibit A.

5. The applicant, NGL (OGRID No. 372338), seeks an order approving the Ghost Rider SWD #1 well. This well is a salt water disposal well.

6. The well will be spaced out and not located closer than approximately 1 mile from other disposal wells approved for injection into the Devonian and Silurian formations.

7. 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.

8. The well will primarily be injecting fluids into the Wristen Group and Fusselman formations, with some fluids potentially being injected into the Upper Montoya Group. Each of these sub-formations or zones 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 that has significant primary and secondary porosity and permeability that is collectively between 800 to 1,800 feet thick.

9. I have reviewed step rate tests for similar disposal wells drilled within the area and conducted a nodal analysis. It is my opinion that a large percentage of surface pressure encountered using smaller diameter tubing was a result of friction pressure. For instance, in Case No. 15720, evidence was presented to the Division showing that up to 85% of this surface pressure was due to friction. Increasing the tubing size would reduce friction and would conserve pump horsepower, fuel, and reduce emissions.

10. My nodal analysis indicates that increasing the tubing size to 7" by 5 ½" would not significantly increase reservoir pressures over a twenty-year time period. The injection zone is located within a reservoir with significant thickness consisting of of high permeability rocks, which results in only very small pressure increases even when injection is increased to a rate of 40,000 barrels per day over a 20-year period.

11. 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 wells would result in fractures to the formation.

12. I have also studied the potential impact on pore pressures and put together a simulation of the radial influence that the wells would have if larger tubing is used for a period of time. A copy of this study is included in Attachment 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 further than 1 mile in 20 years.

13. My studies further indicate that additional injection wells located one mile away from the proposed well will not create any materially adverse pressures in the formation.

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

15. The granting of these applications is in the interests of conservation and the prevention of waste.

*[Signature page follows]*

Scott J. Wilson

SUBSCRIBED AND SWORN to before me this 7 day of June, 2019 by Scott J. Wilson.

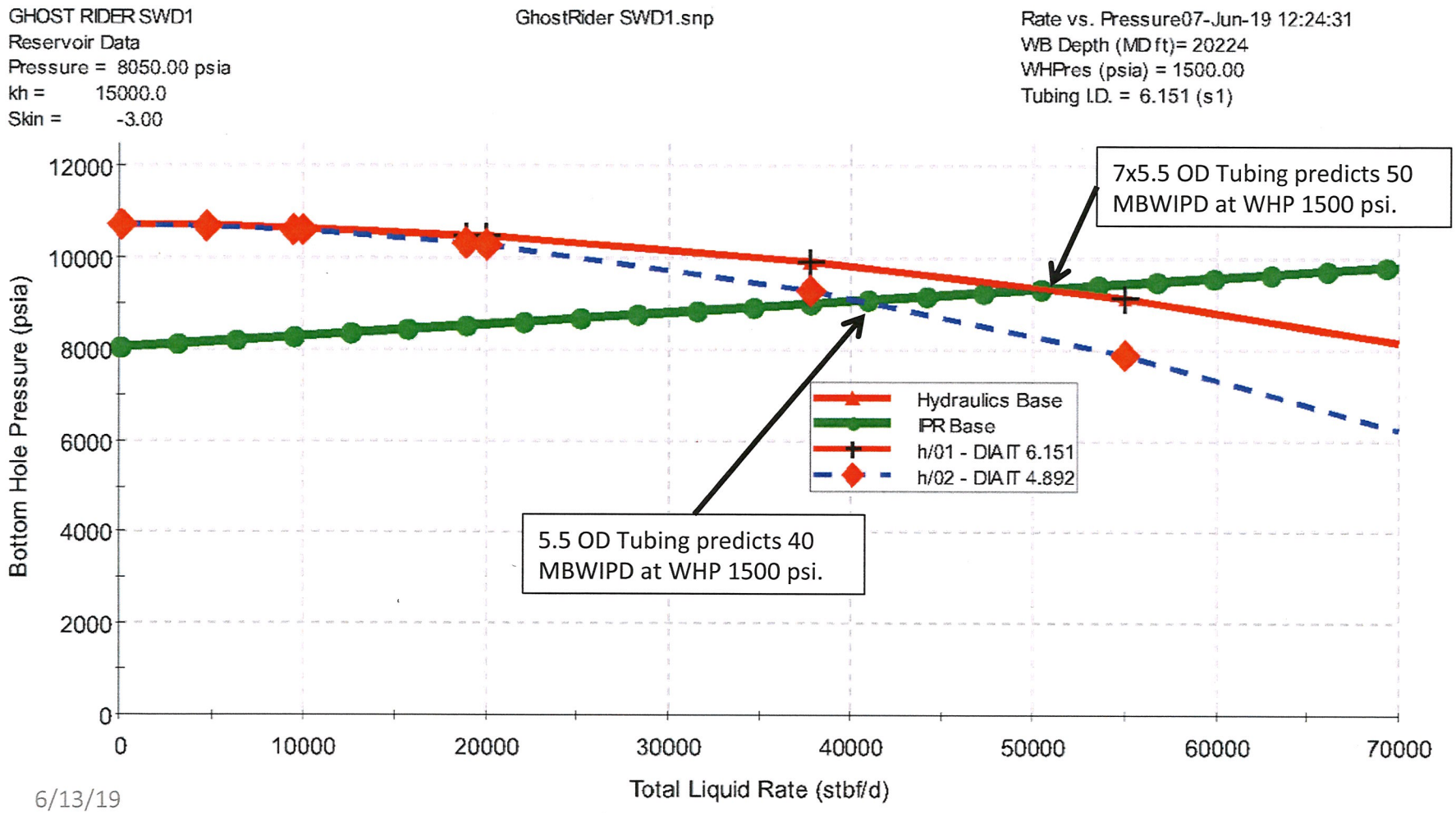
Notary Public

My commission expires: 09/14/2019

MICHAEL VAN DAMME
Notary Public
State of Colorado
Notary ID 20114059237
My Commission Expires Sep 14, 2019

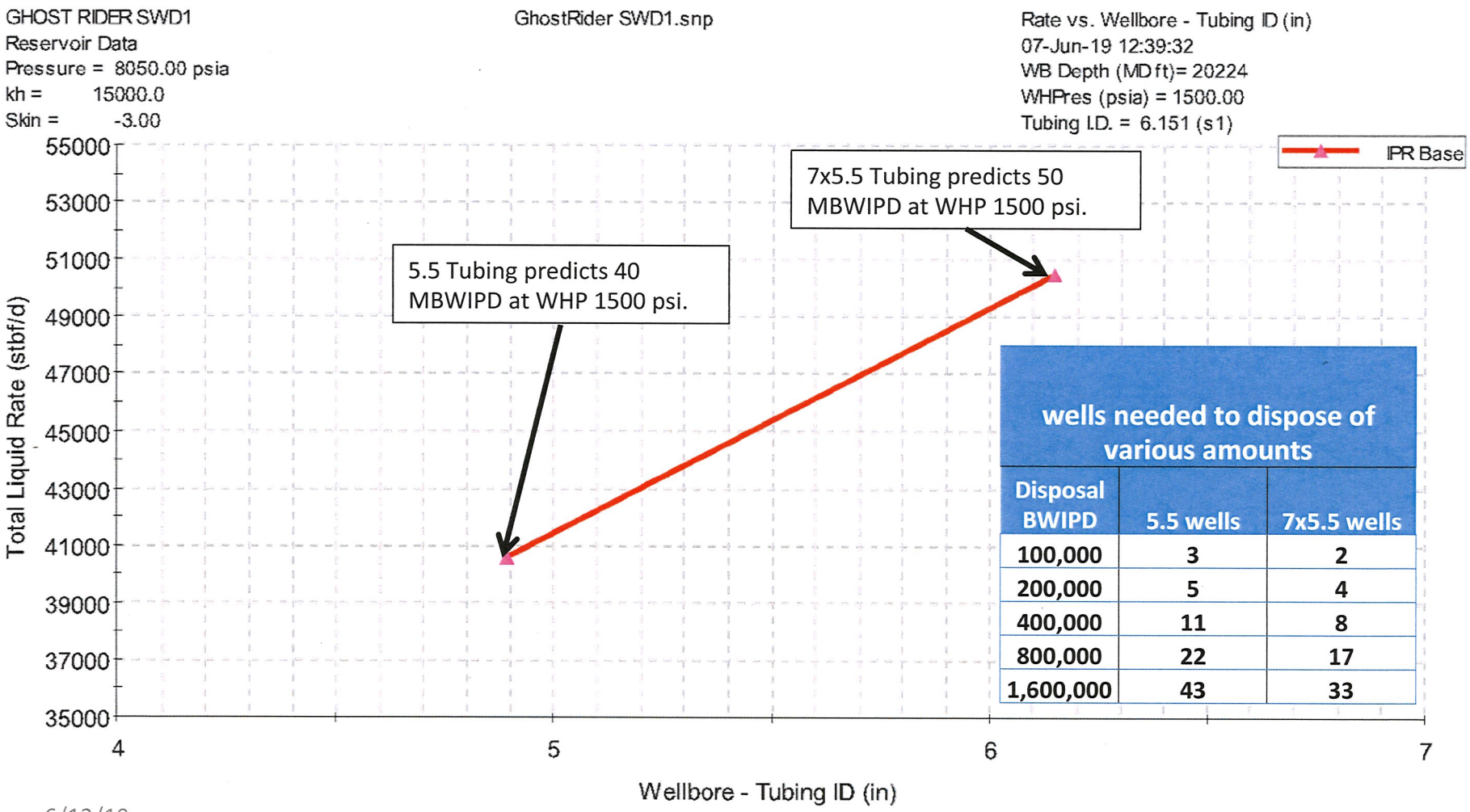
# NGL Water Solutions, LLC

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



# NGL Water Solutions, LLC

## Increased injection rate per well equates to fewer injectors.

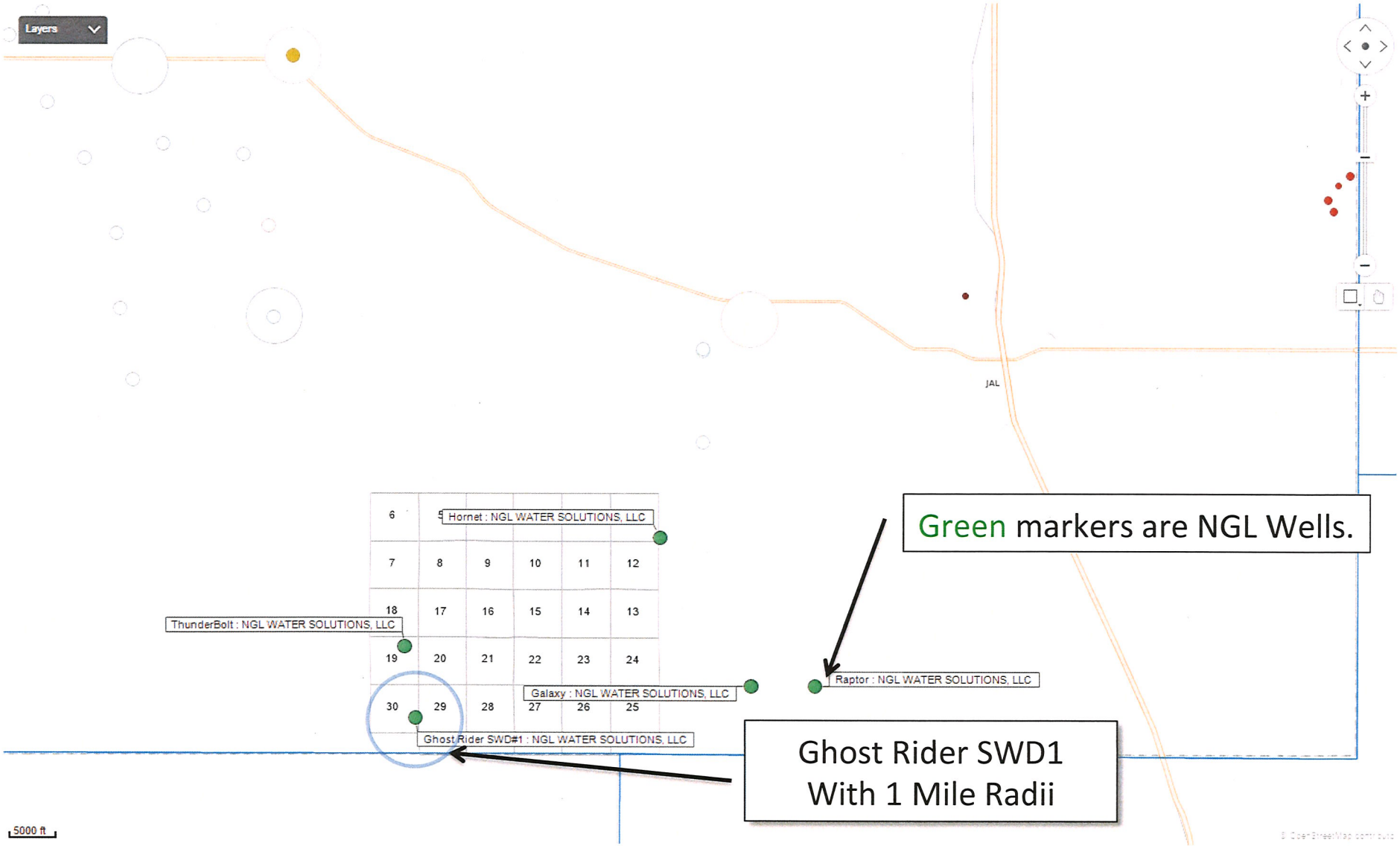



| wells needed to dispose of various amounts | | |
|---|---|---|
| Disposal BWIPD | 5.5 wells | 7x5.5 wells |
| 100,000 | 3 | 2 |
| 200,000 | 5 | 4 |
| 400,000 | 11 | 8 |
| 800,000 | 22 | 17 |
| 1,600,000 | 43 | 33 |

# NGL Water Solutions, LLC

Exh. A3

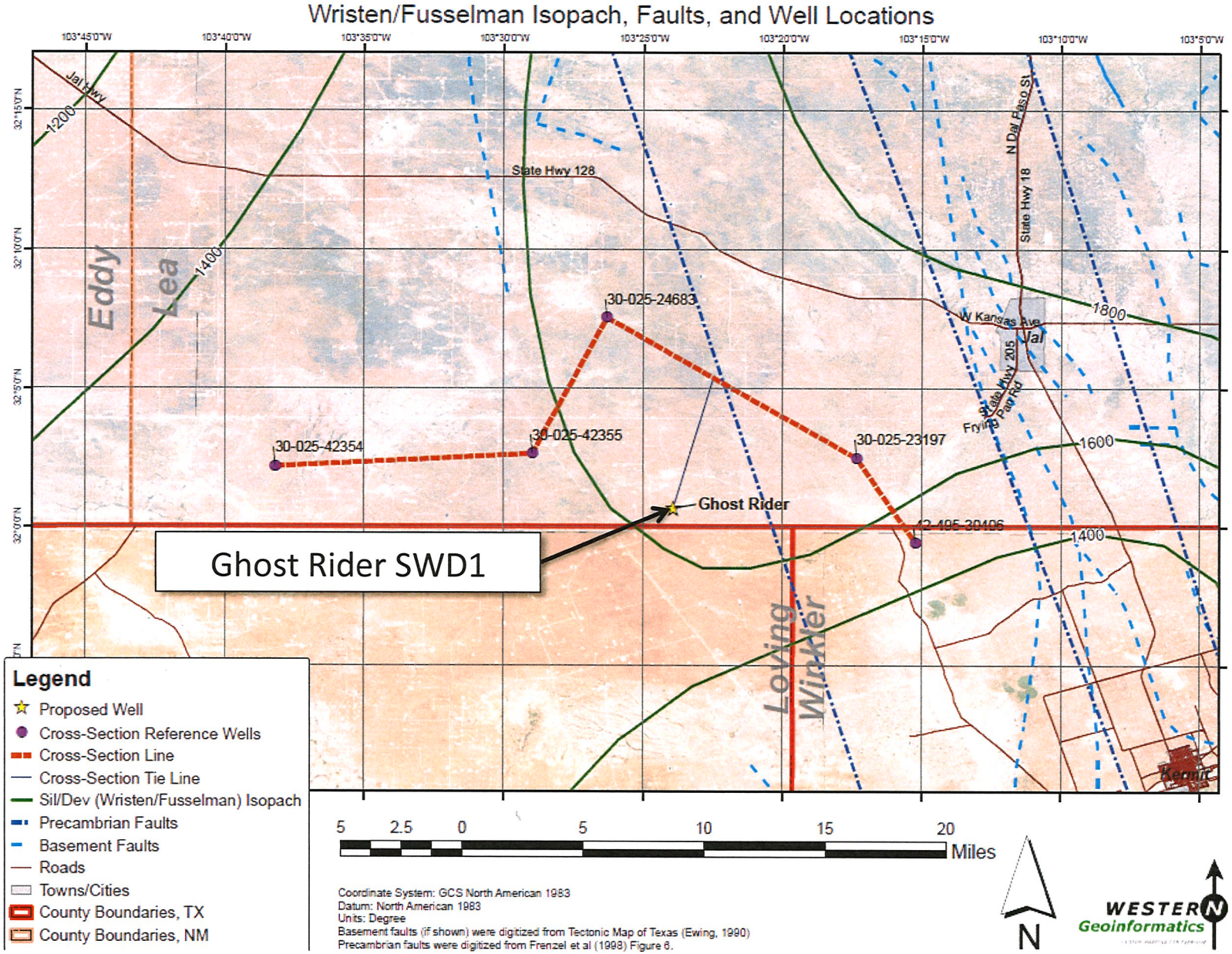
Wells injecting water into the Devonian formation in the area.
Area is roughly 30 miles (E-W) by 18 miles (N-S)



# NGL Water Solutions, LLC

Exh. A4

## Sil/Dev Thickness at Ghost Rider is 1600 feet



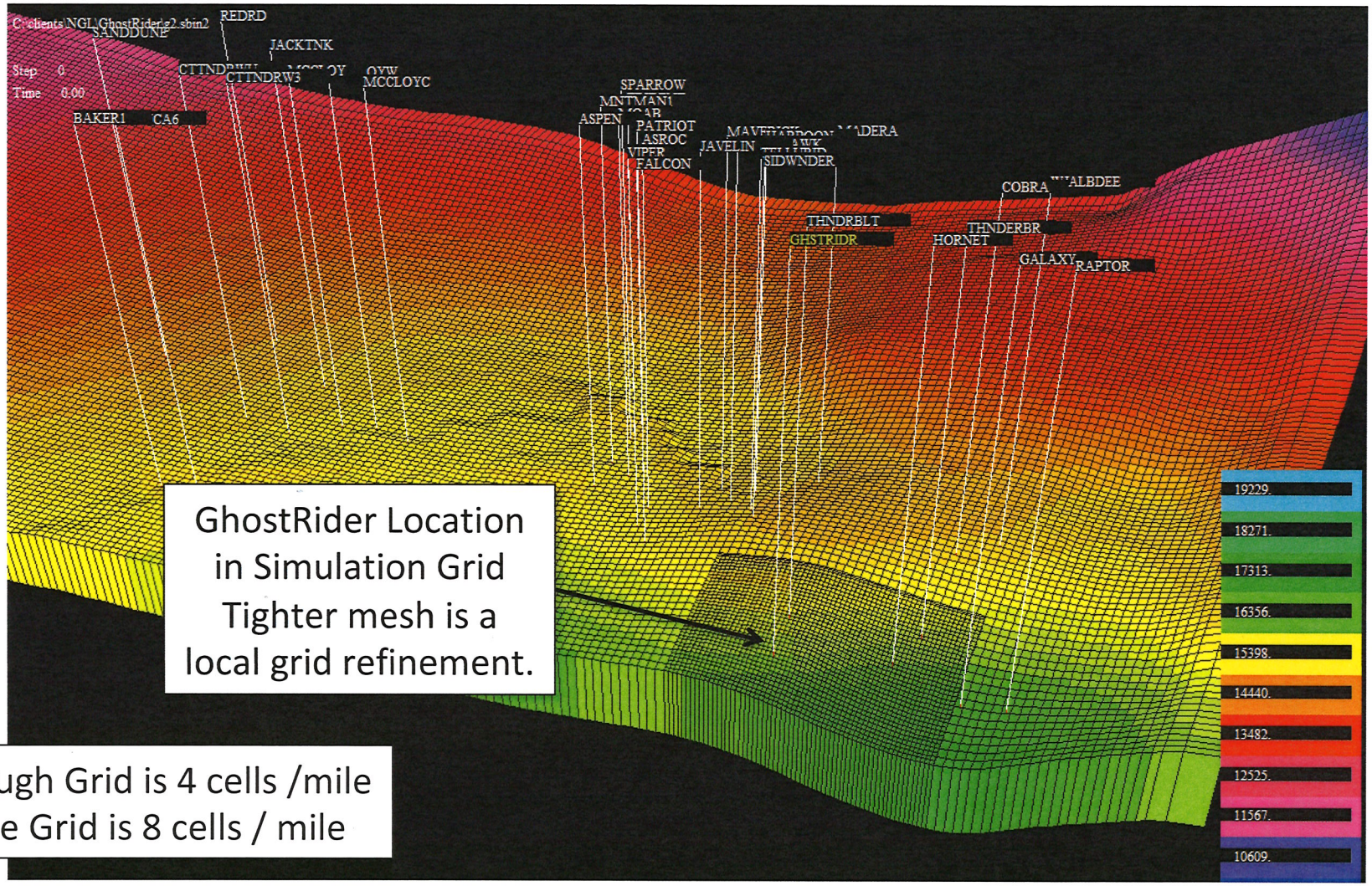
# NGL Water Solutions, LLC

Exh. A5

## Simulation Grid matches Structure and Thickness

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

Observation wells are placed in grid corners to monitor the large scale pressure distribution.



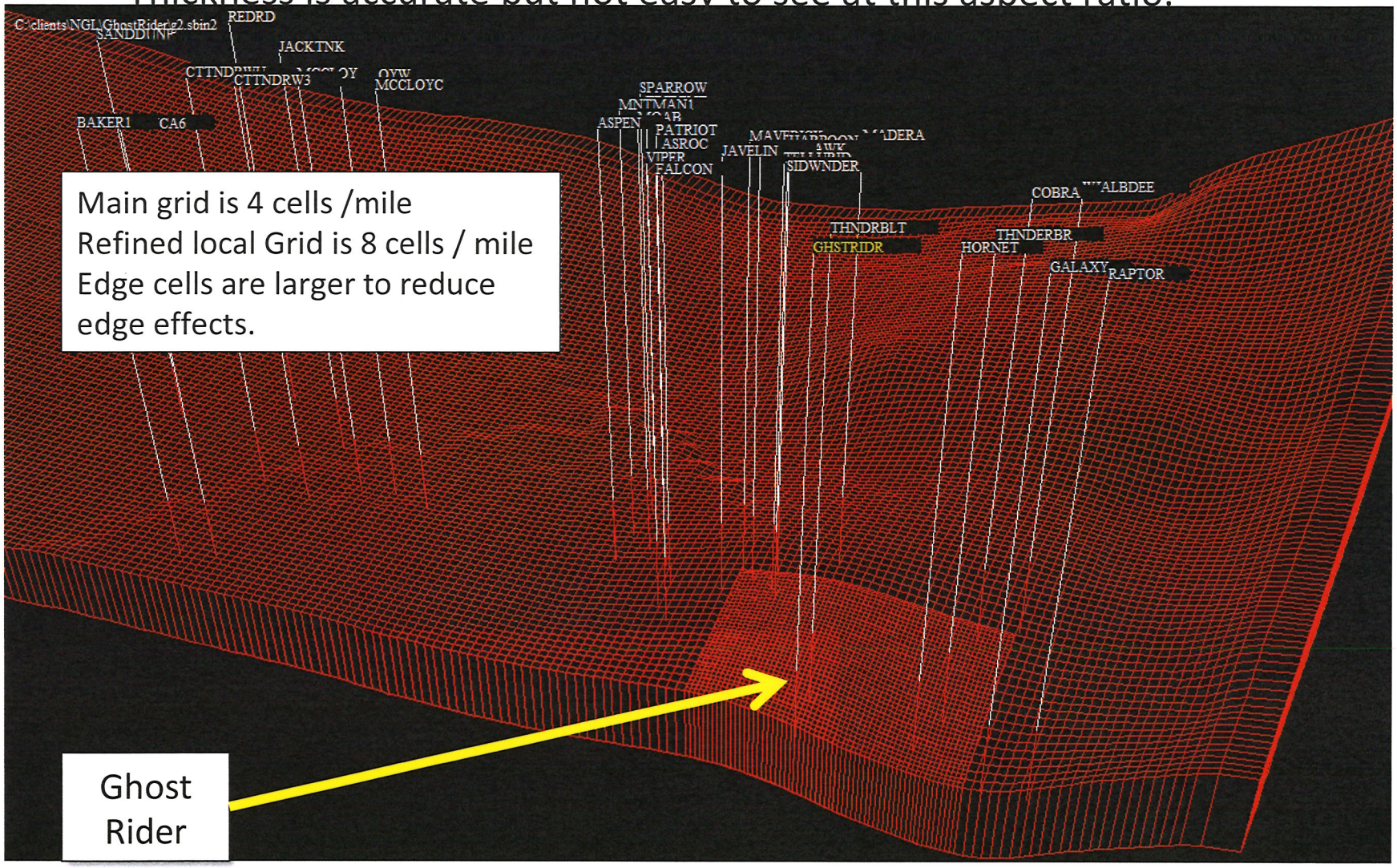

GhostRider Location in Simulation Grid
Tighter mesh is a local grid refinement.

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

# NGL Water Solutions, LLC

## 3D view of grid shows Structural Relief.

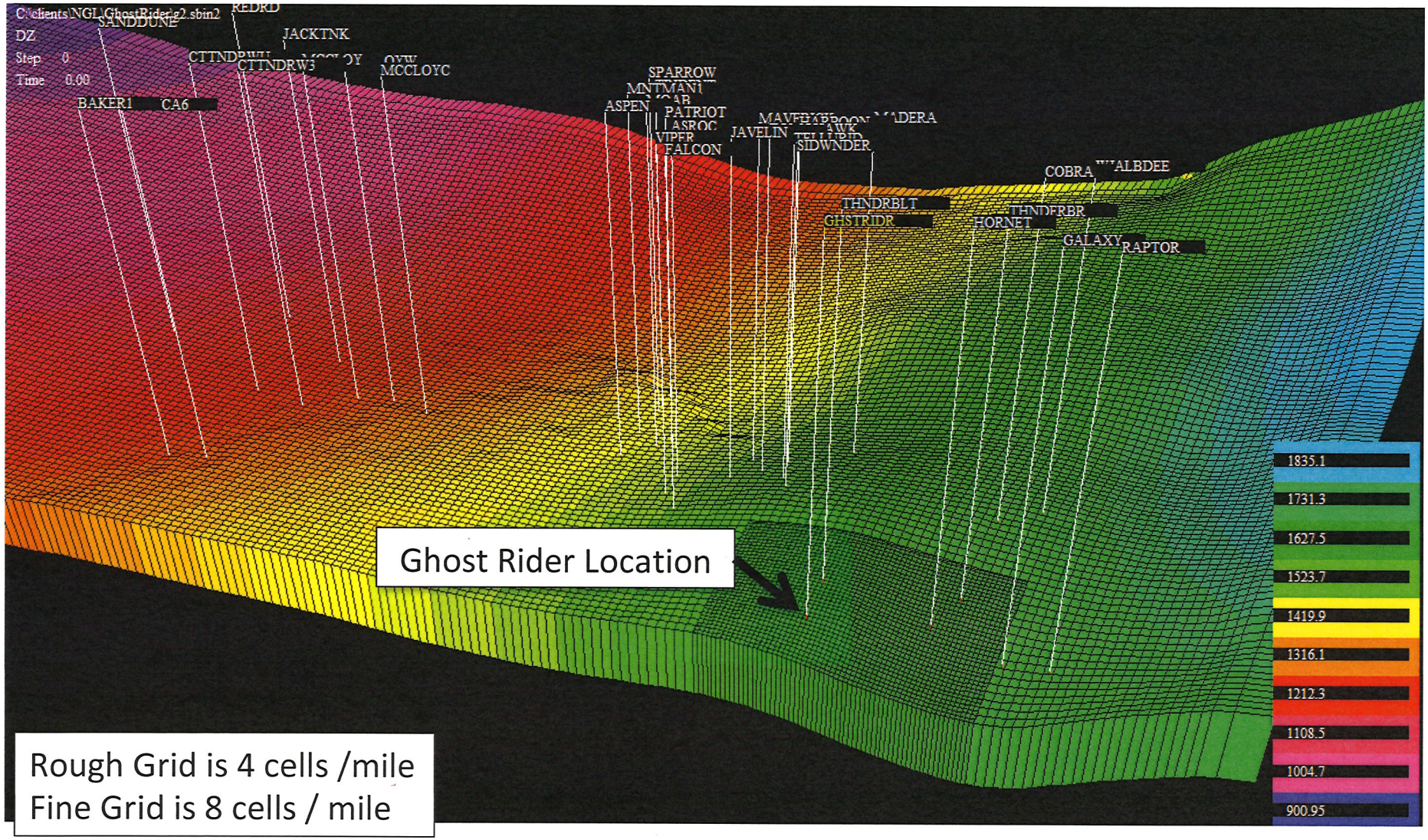
Thickness is accurate but not easy to see at this aspect ratio.



Exh. A7

# NGL Water Solutions, LLC

## Light Blue color to the North East is the thickest Sil/Dev.

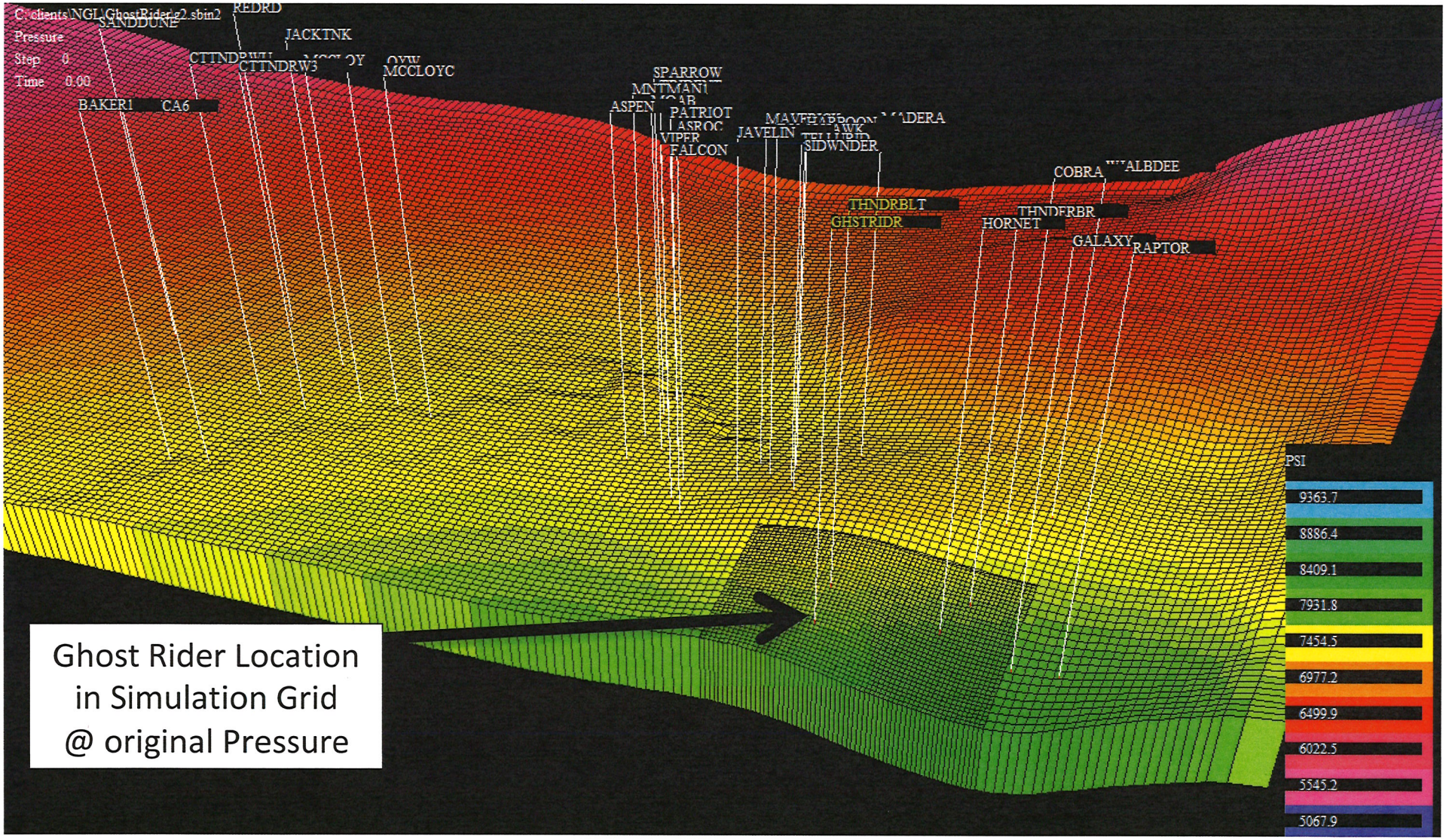



Rough Grid is 4 cells /mile
Fine Grid is 8 cells / mile

# NGL Water Solutions, LLC

Exh. A8

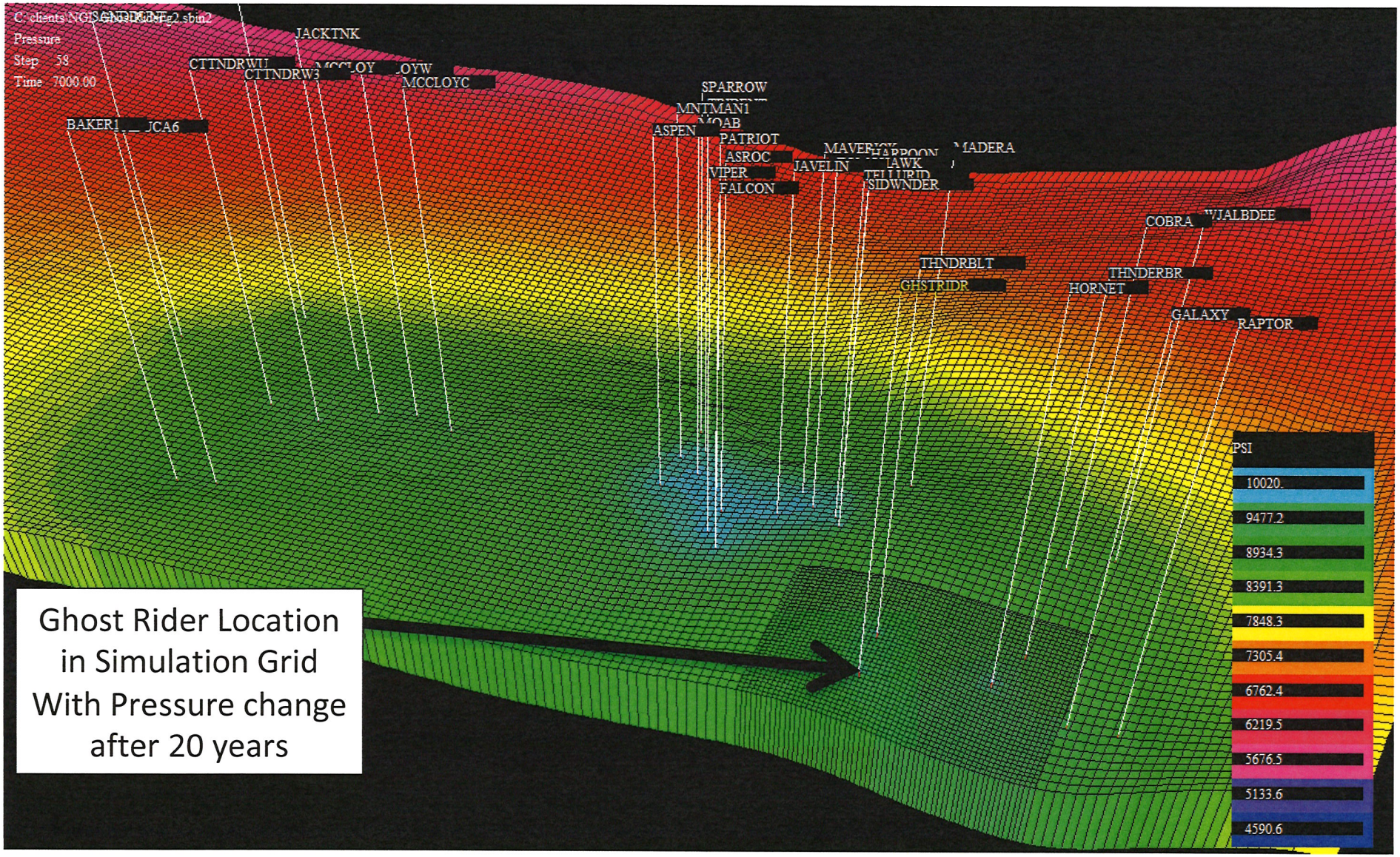
Initial pressure is equilibrated by the model based on grid cell depth, fluids(water) and capillary pressure.



# NGL Water Solutions, LLC

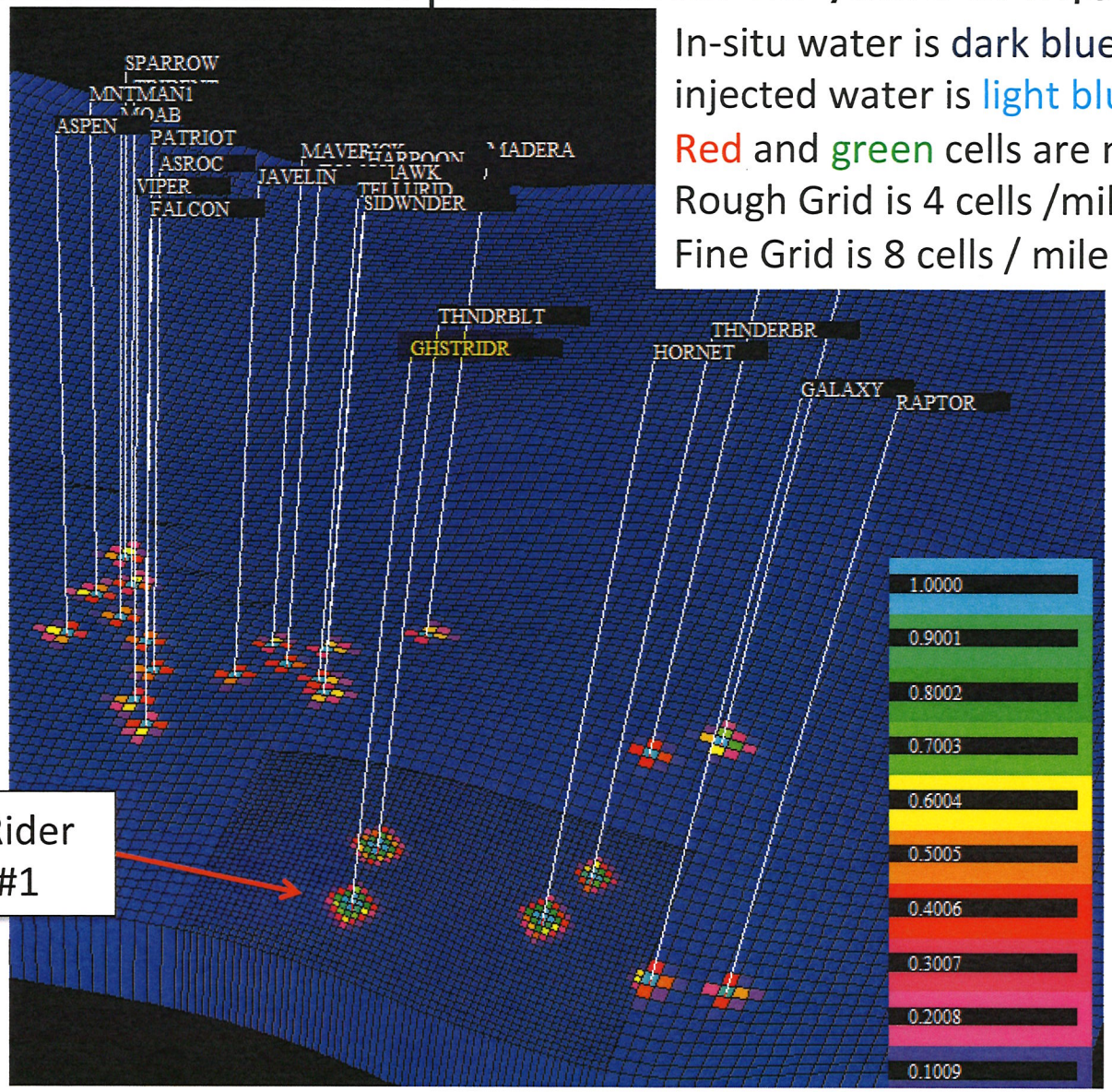
Exh. A9

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



# NGL Water Solutions, LLC

## Large scale saturation profiles after 20 years of injection.




In-situ water is dark blue

injected water is light blue

Red and green cells are mixed/transition

Rough Grid is 4 cells /mile

Fine Grid is 8 cells / mile

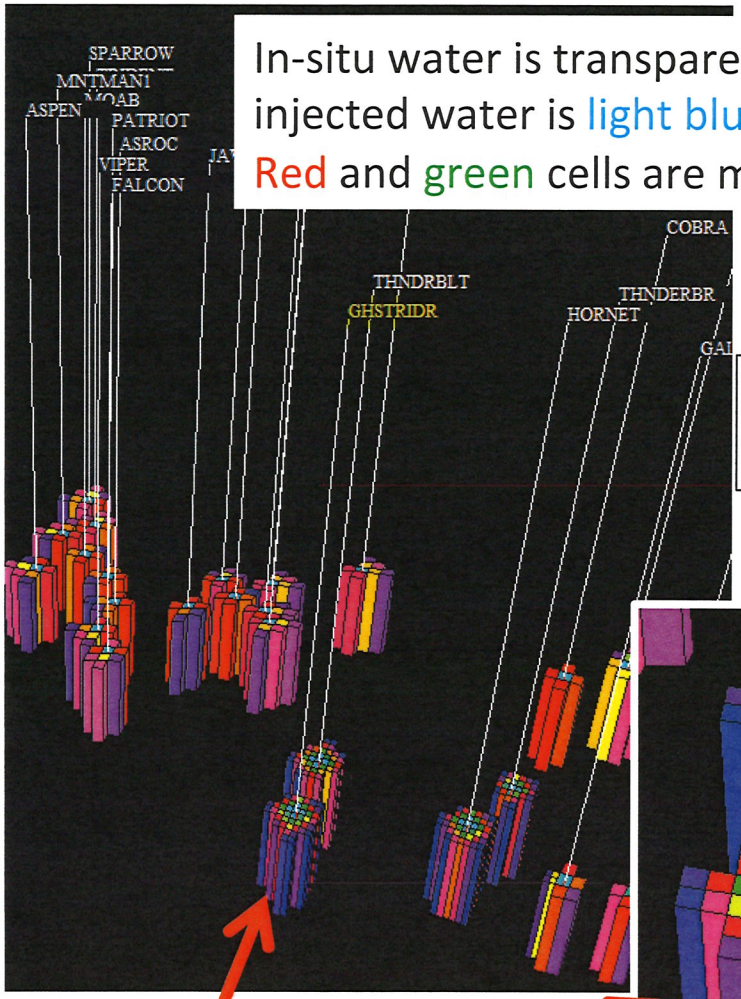
Ghost Rider
SWD #1

# NGL Water Solutions, LLC

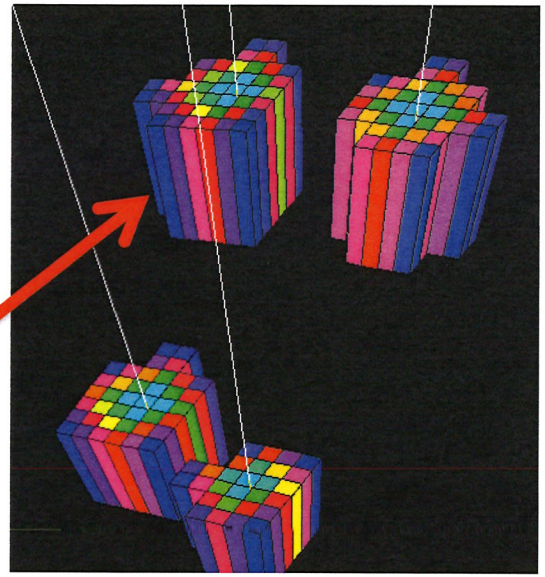
Exh. A11

## Detailed saturation profiles after 20 years of injection.

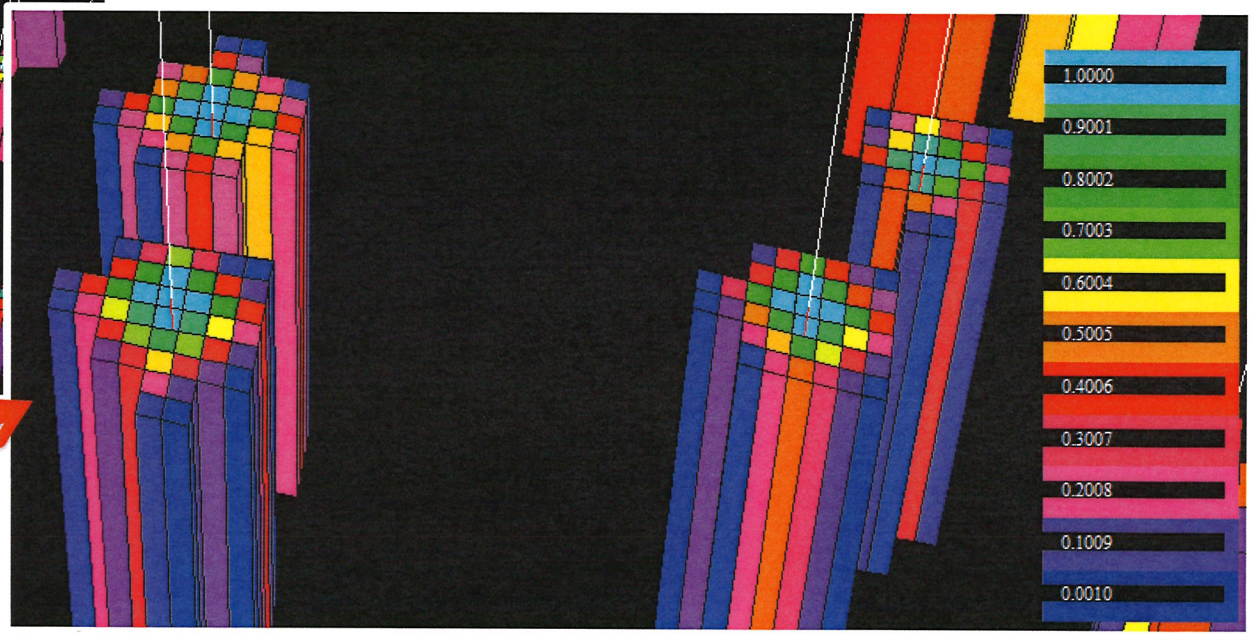
In-situ water is transparent
injected water is light blue
Red and green cells are mixed/transition




Ghost Rider SWD #1



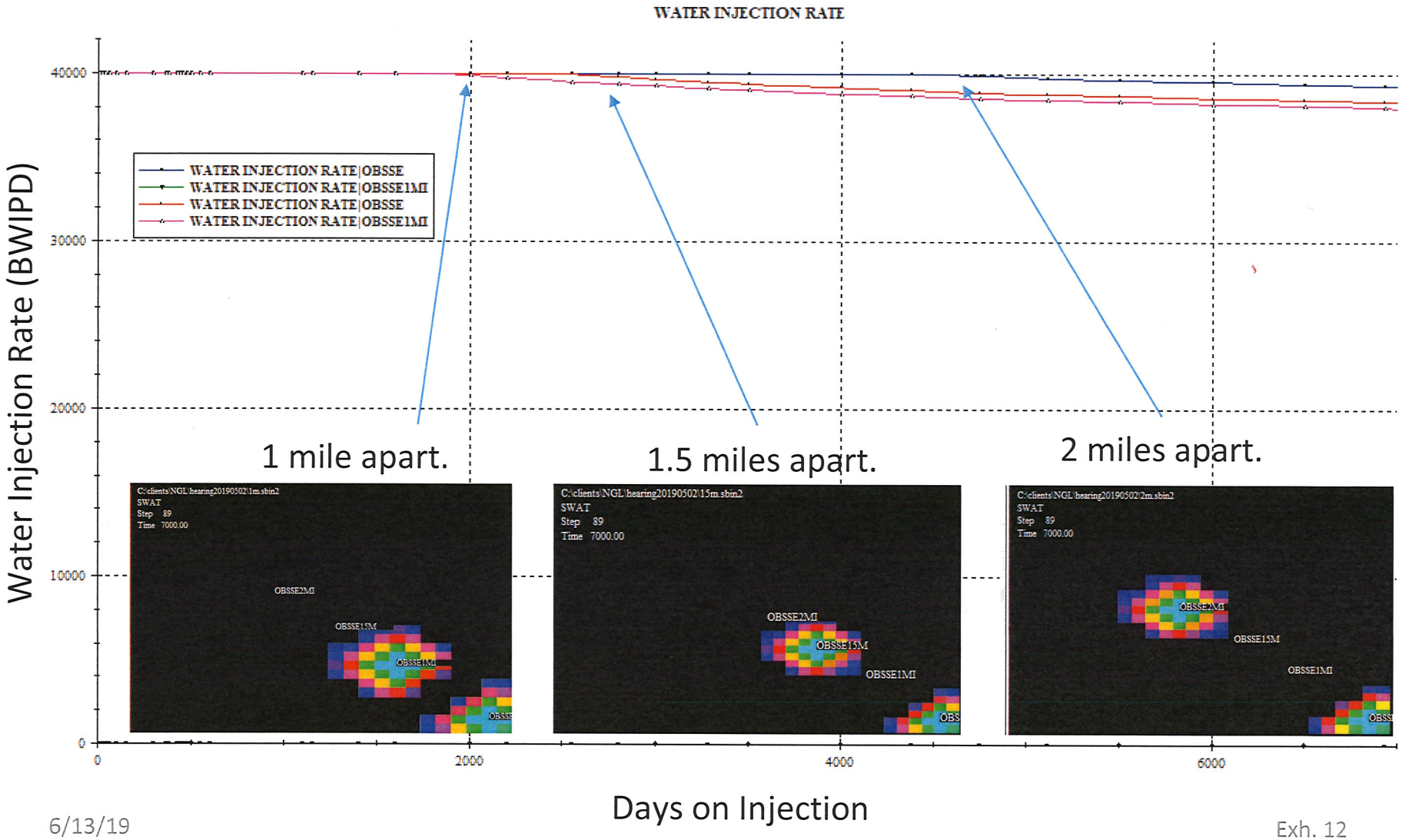
Ghost Rider SWD #1



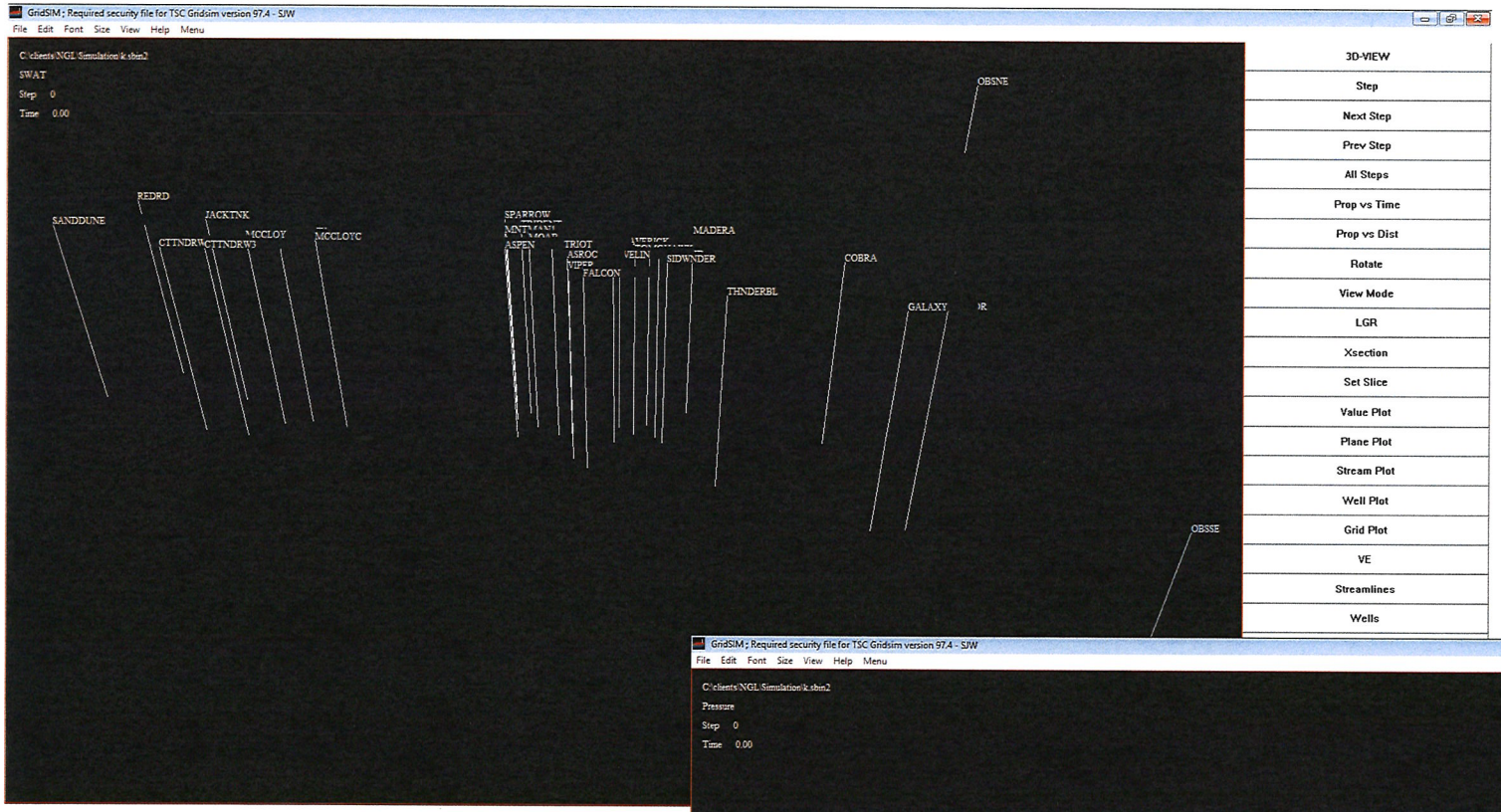
# NGL Water Solutions, LLC

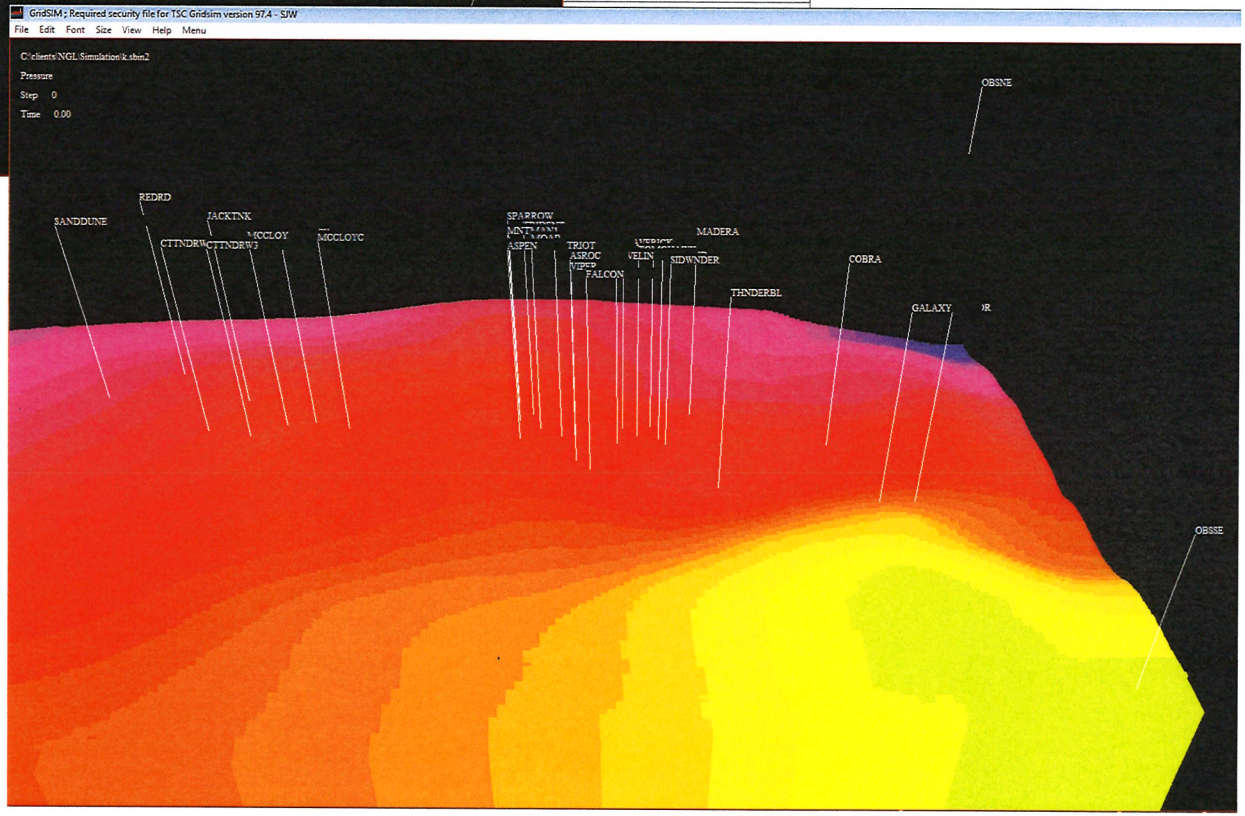


Typical wells showing interference when spaced 1, 1.5, and 2 miles apart.
Closer spacing causes rates to fall, but not significantly.



Exh. A13



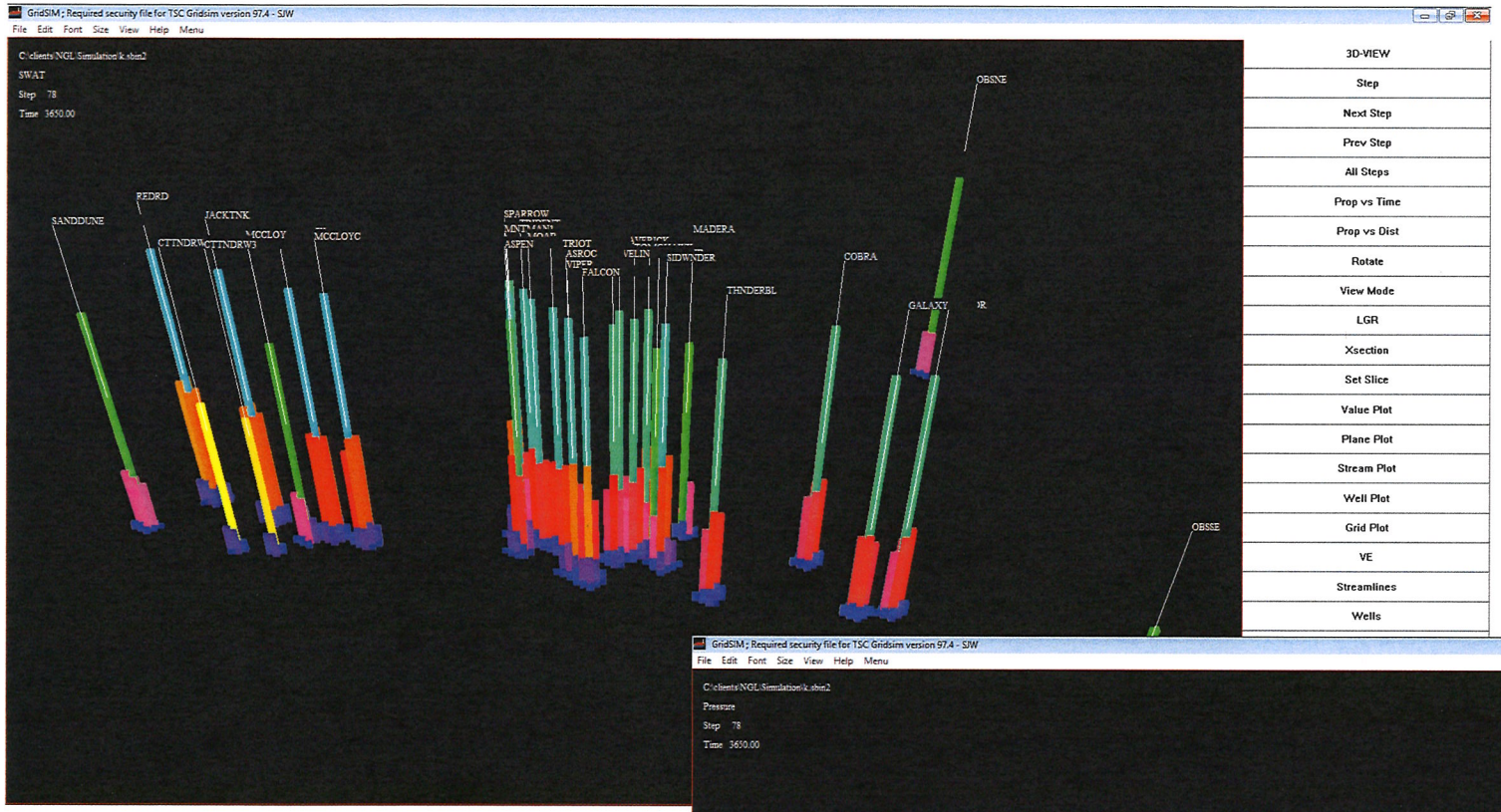



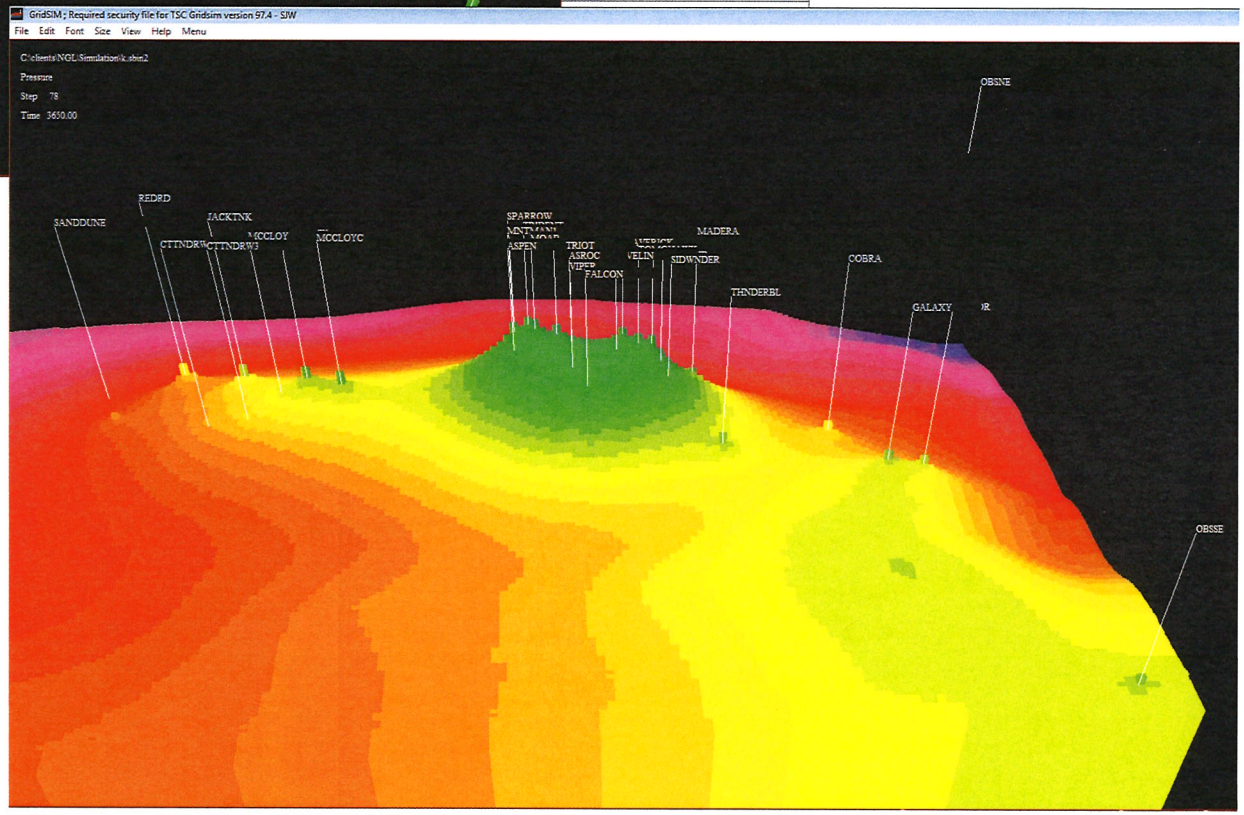

# 2019 (0 years)

# Typical Water movement & Pressure

6/13/19

Exh. A14



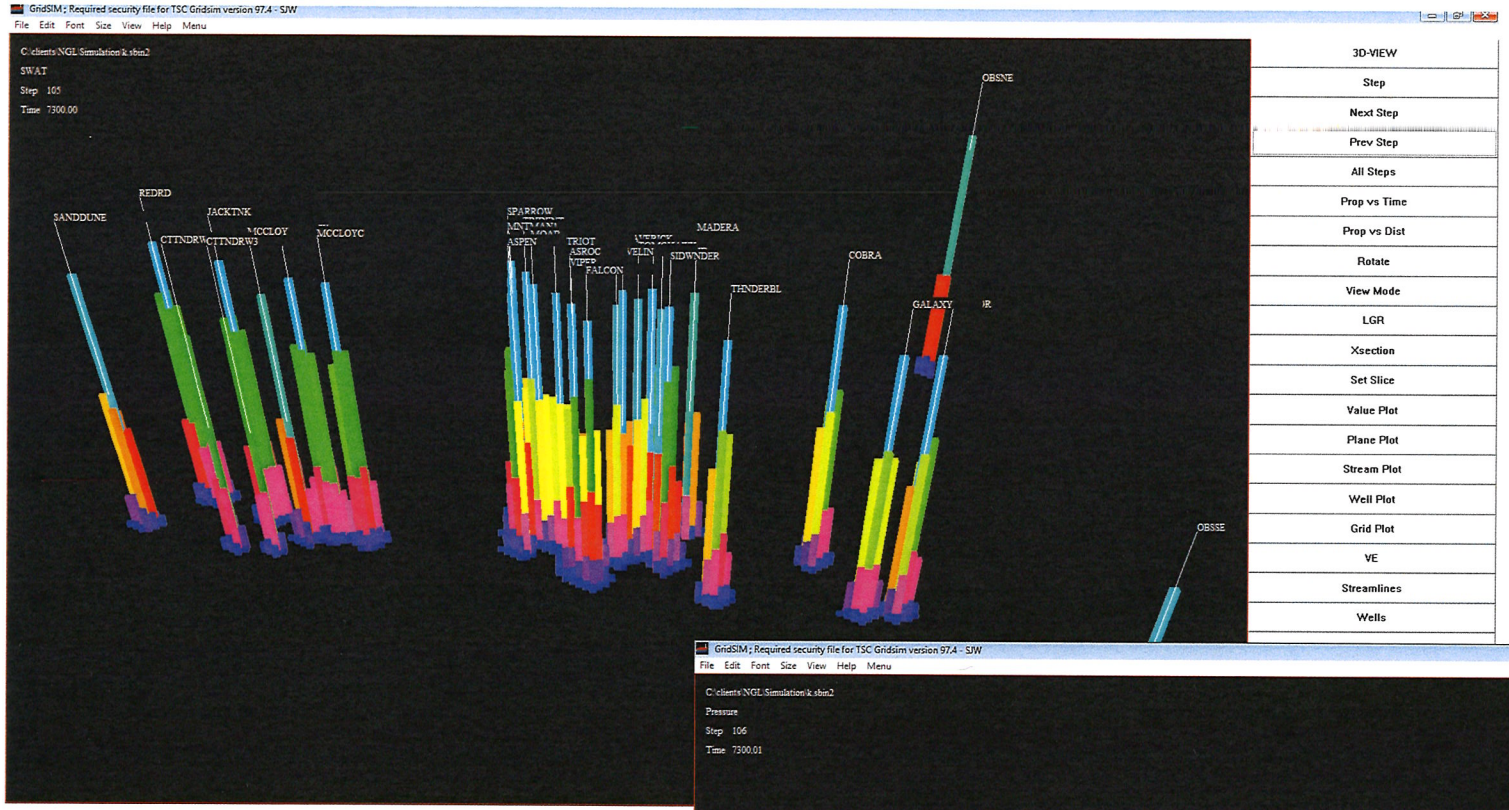



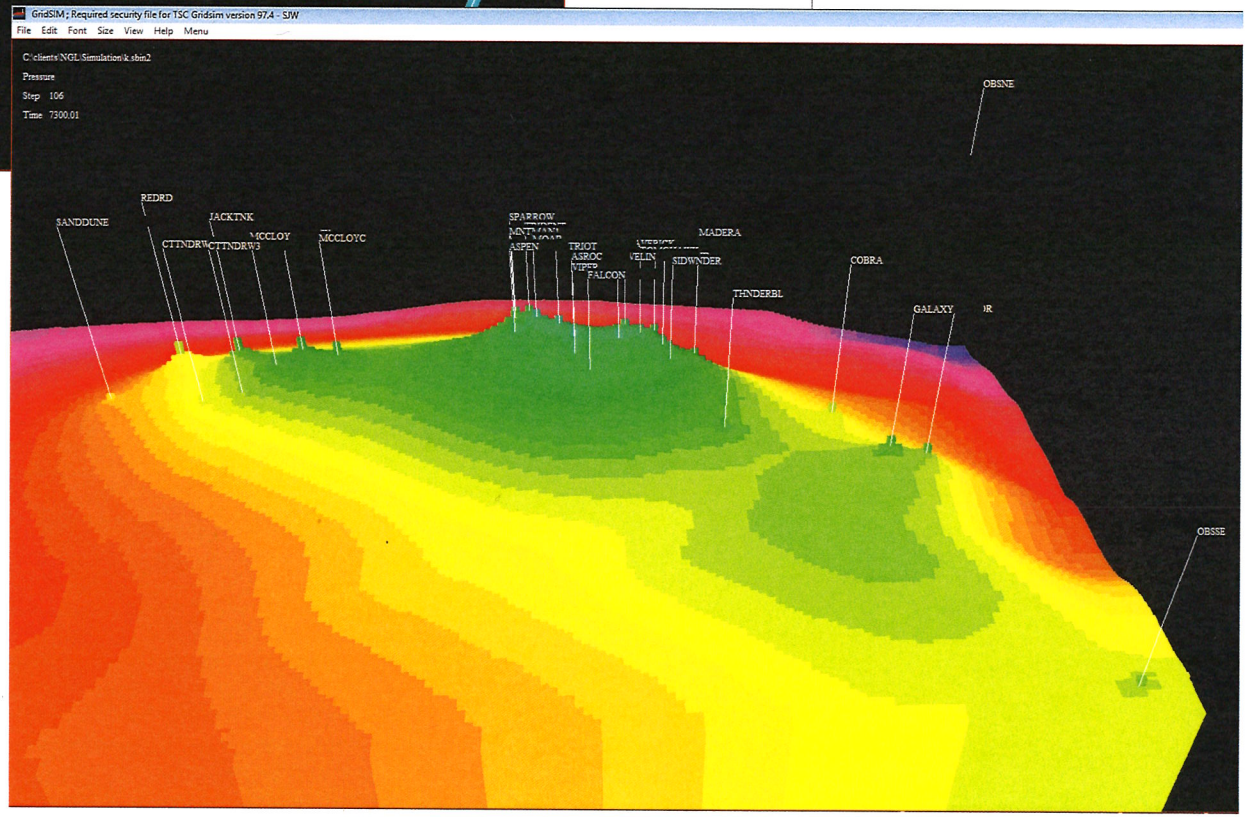

# 2029 (10 years)

# Typical Water movement & Pressure

6/13/19

Exh. A15



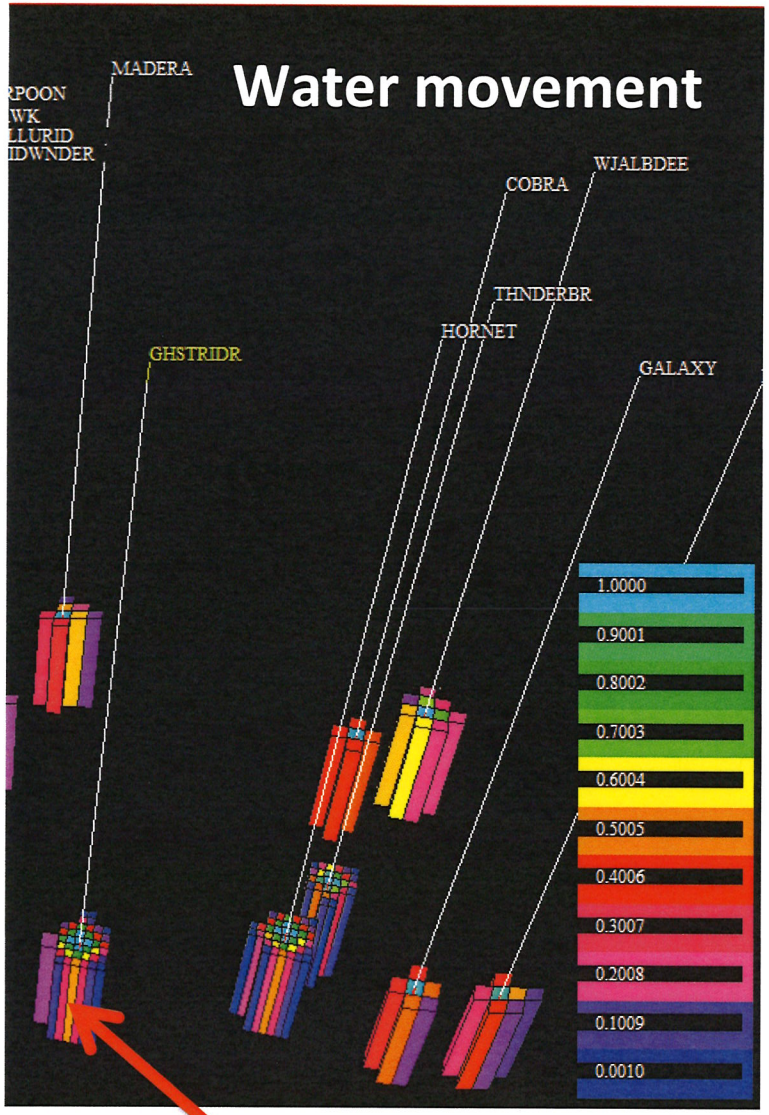



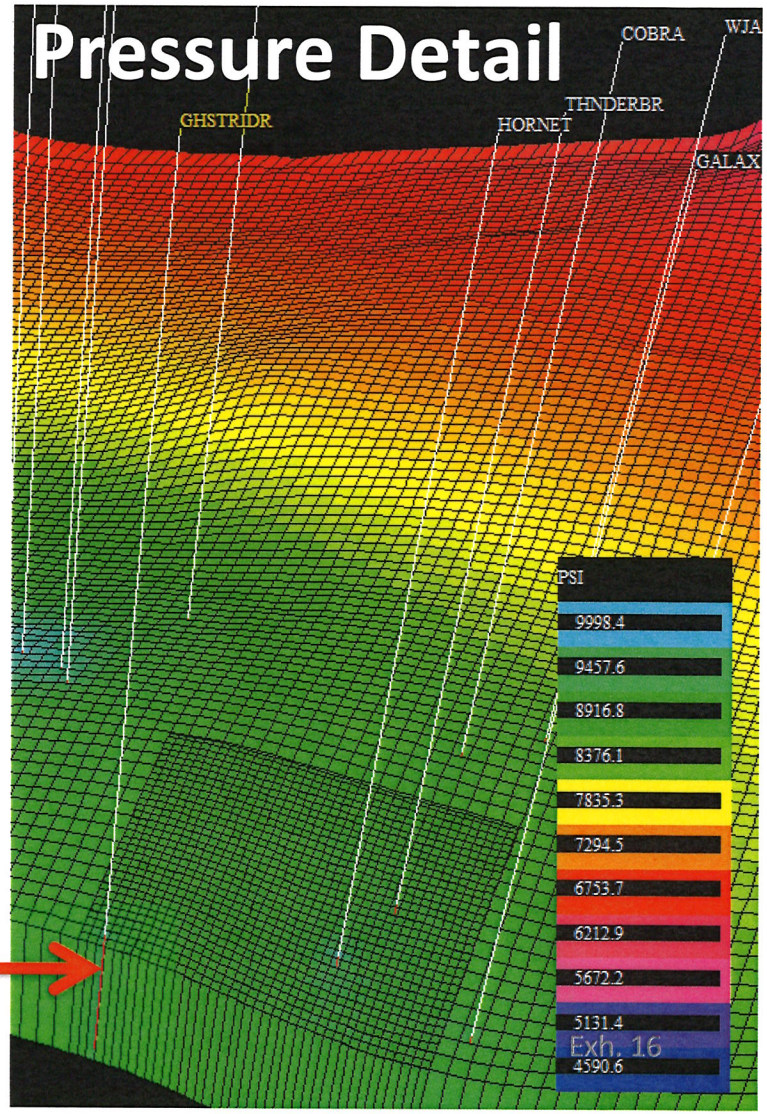

# 2039 (20 years)

# Typical Water movement & Pressure

6/13/19

# Detail water saturation and pressure distributions at 2039 (20 years)



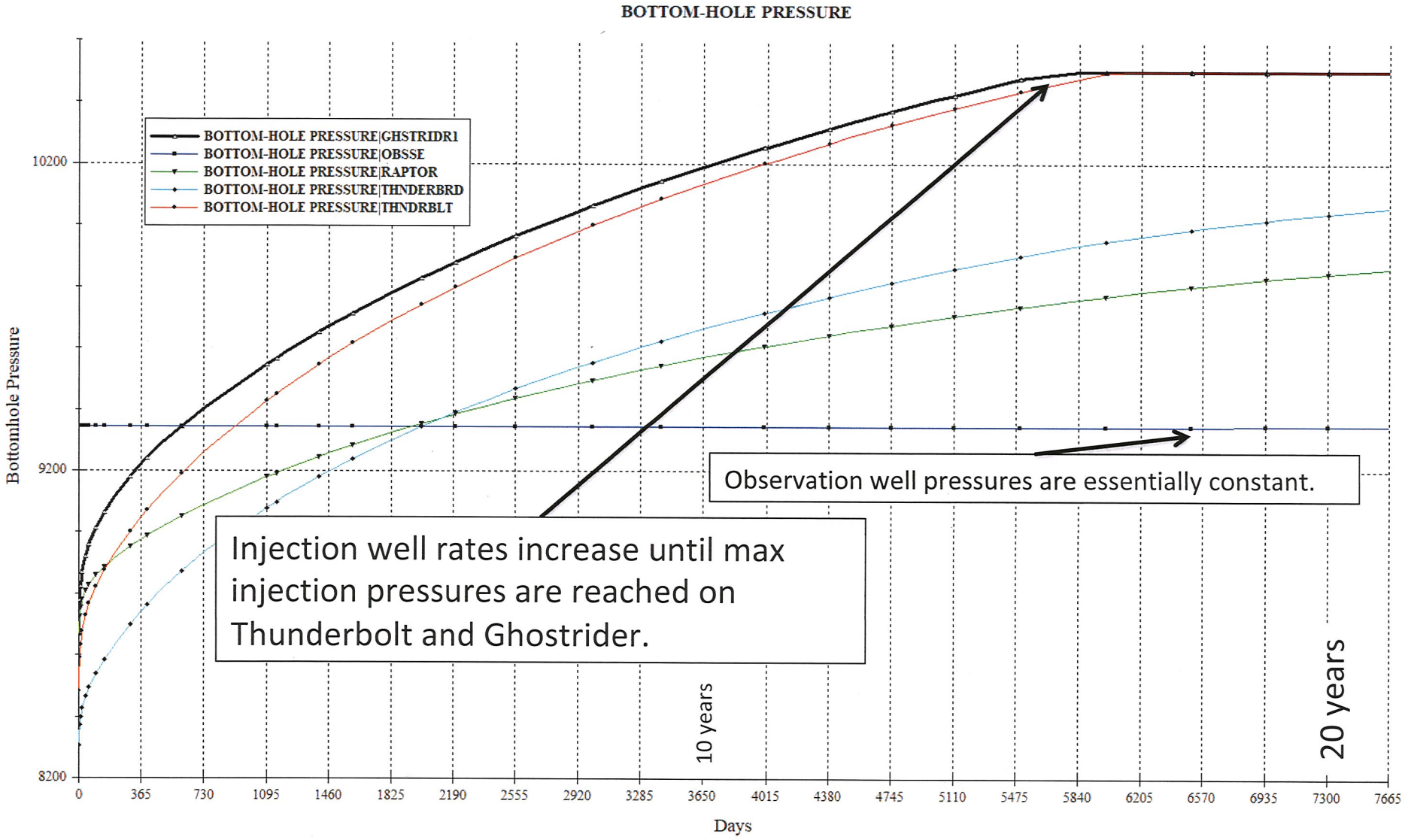




Ghost Rider

# NGL Water Solutions, LLC

Exh. A17

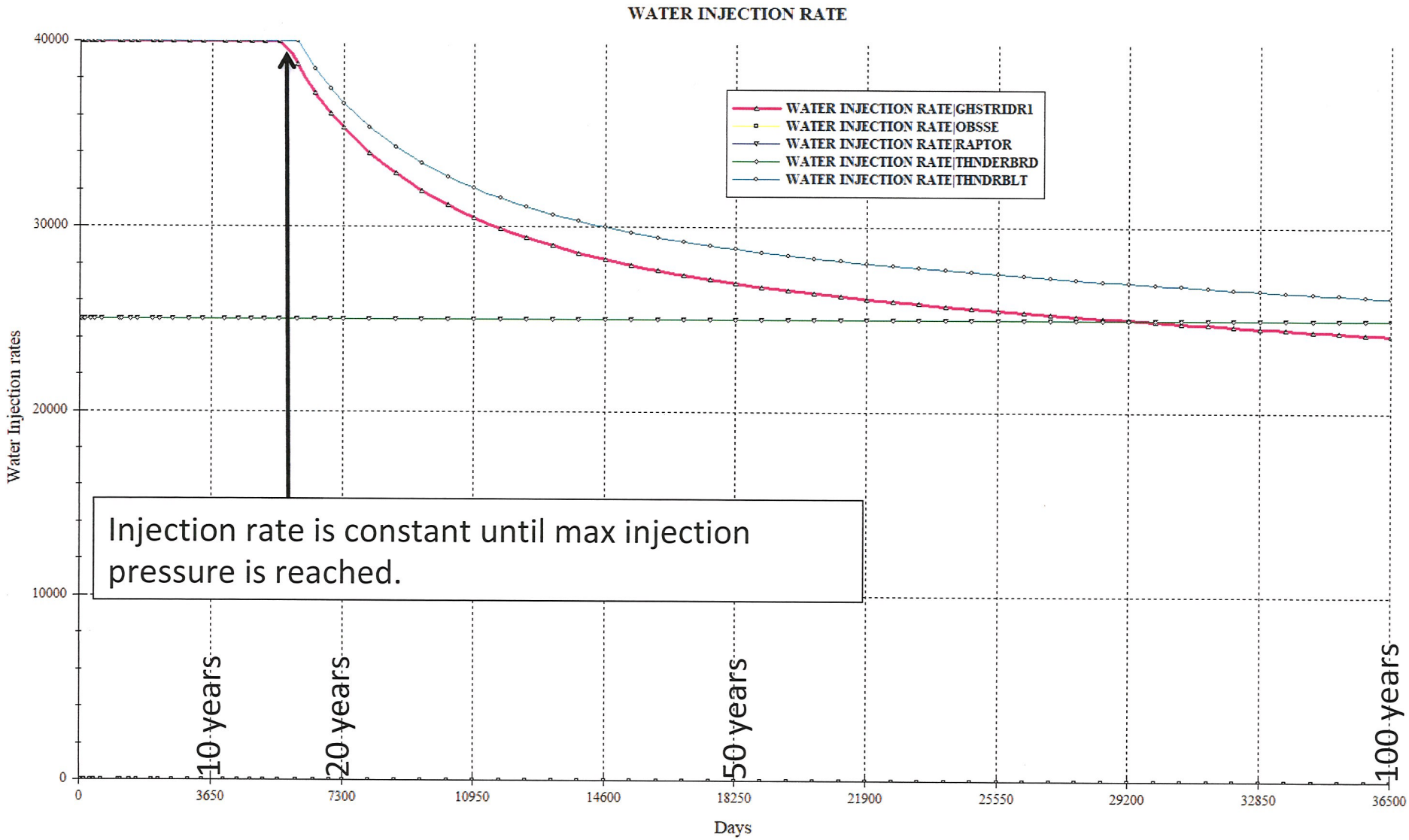
## Simulation BHIP predictions for wells near Ghost Rider



# NGL Water Solutions, LLC

Exh. A18

## Simulation predictions for individual wells over 100 Years



# Exhibit 3

**Dr. Kate Zeigler Exhibits**

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

**APPLICATION OF NGL WATER SOLUTIONS PERMIAN, LLC FOR APPROVAL OF SALT WATER DISPOSAL WELL IN LEA COUNTY, NEW MEXICO** **Case No. 20575**

**AFFIDAVIT OF KATE ZEIGLER**

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

I, 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 application that NGL Water Solutions Permian, LLC ("NGL") 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 is included in Attachment A to this affidavit.

5. The applicant, NGL (OGRID No. 372338), seeks an order approving the Ghost Rider SWD #1 well. This well is a salt water disposal well.

6. I have been informed that the injection interval 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, and 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 well will be spaced out and not located closer than approximately 1 mile from other disposal wells that have been approved for injection into the Devonian and Silurian formations.

8. The injection zone for the well is located below the Woodford Shale. The Woodford Shale is an Upper Devonian unit that 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 100 to 150 feet thick.

9. 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 that prevents fluids from migrating downwards into deeper formations and the basement rock. In the area where the well is proposed to be located, the Ordovician formation is between 800' and 900' 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 700 feet thick.

10. 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 wells.

11. 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 is 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 1,700 to 2,000 feet thick.

12. It is my opinion that there is no risk to freshwater resources from 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.

13. 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 is located approximately 4 miles away from the proposed well location.

14. 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.

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

16. The granting of these applications is in the interests of conservation and the prevention of waste.

*[Signature page follows]*

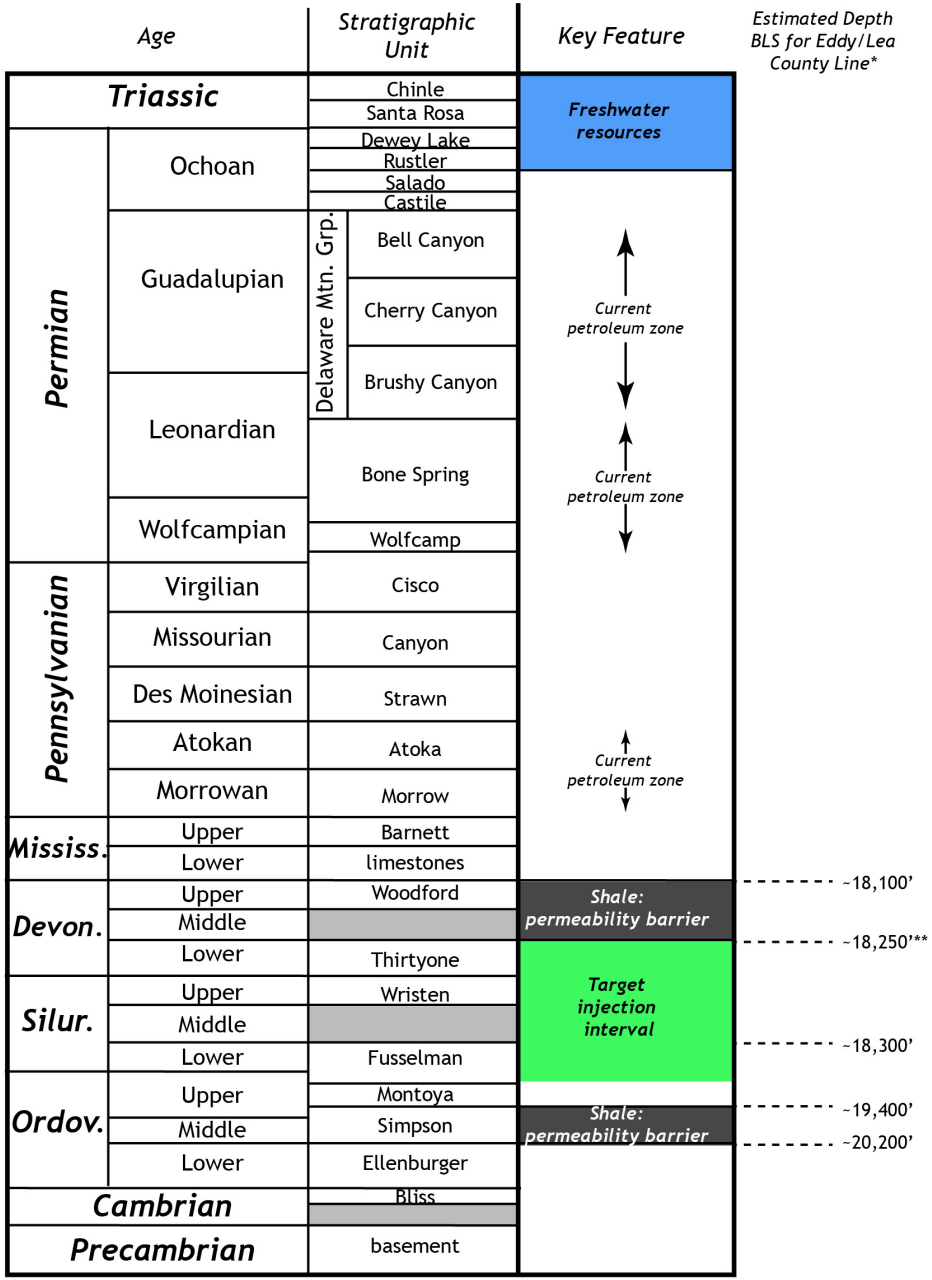
OFFICIAL SEAL
MISTI GUTIERREZ
NOTARY PUBLIC-State of New Mexico
My Commission Expires 03-15-2021

Kate Zeigler

SUBSCRIBED AND SWORN to before me this 12th day of June, 2019 by Kate Zeigler.

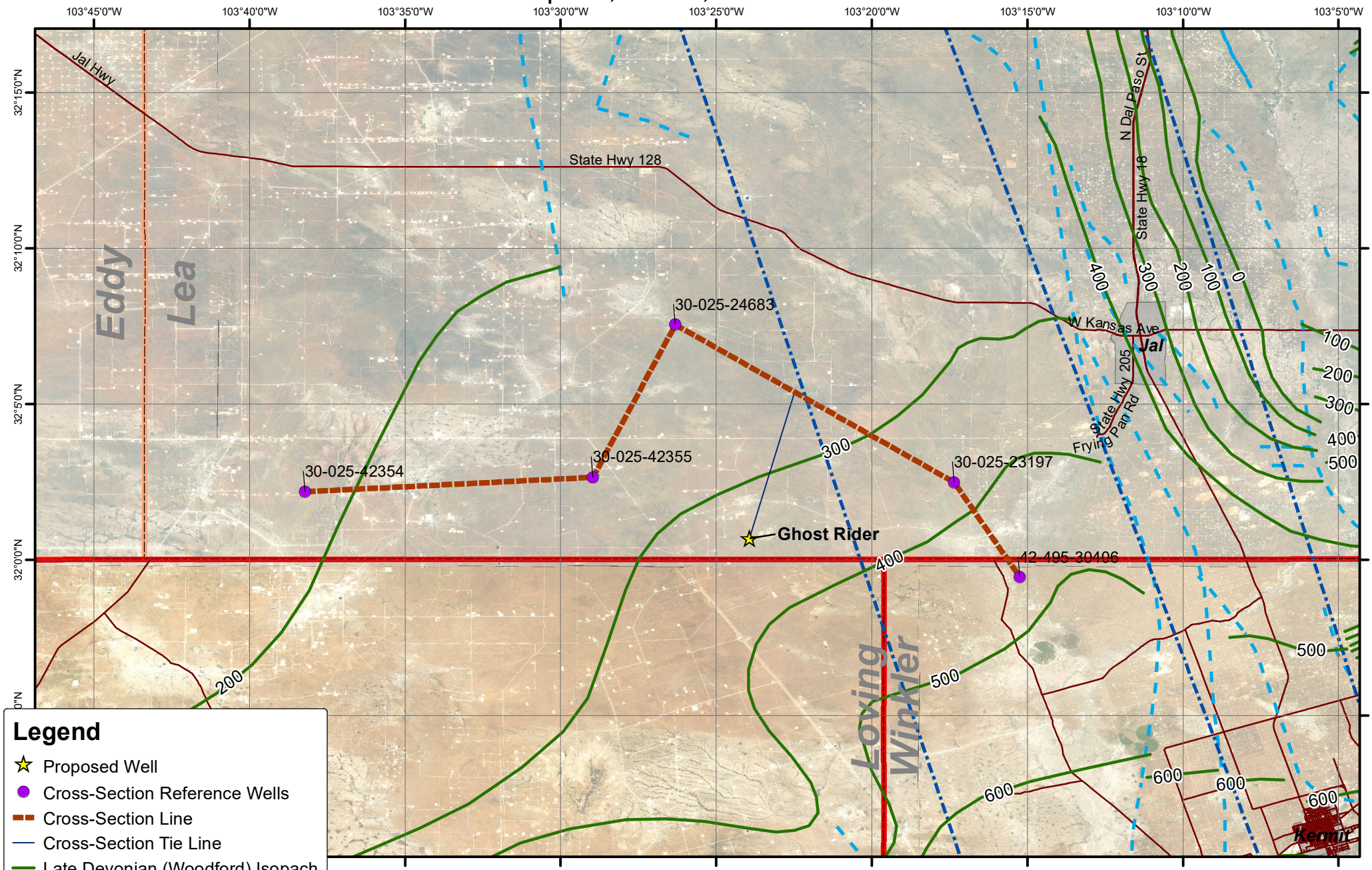
Notary Public

My commission expires: March 15, 2021




Stratigraphic chart for the Delaware Basin from Broadhead (2017).
* Based on data from 30-025-24683 Fairview Mills Fed #1 (14-25S-34E).

# Woodford Isopach, Faults, and Well Locations




## Legend

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

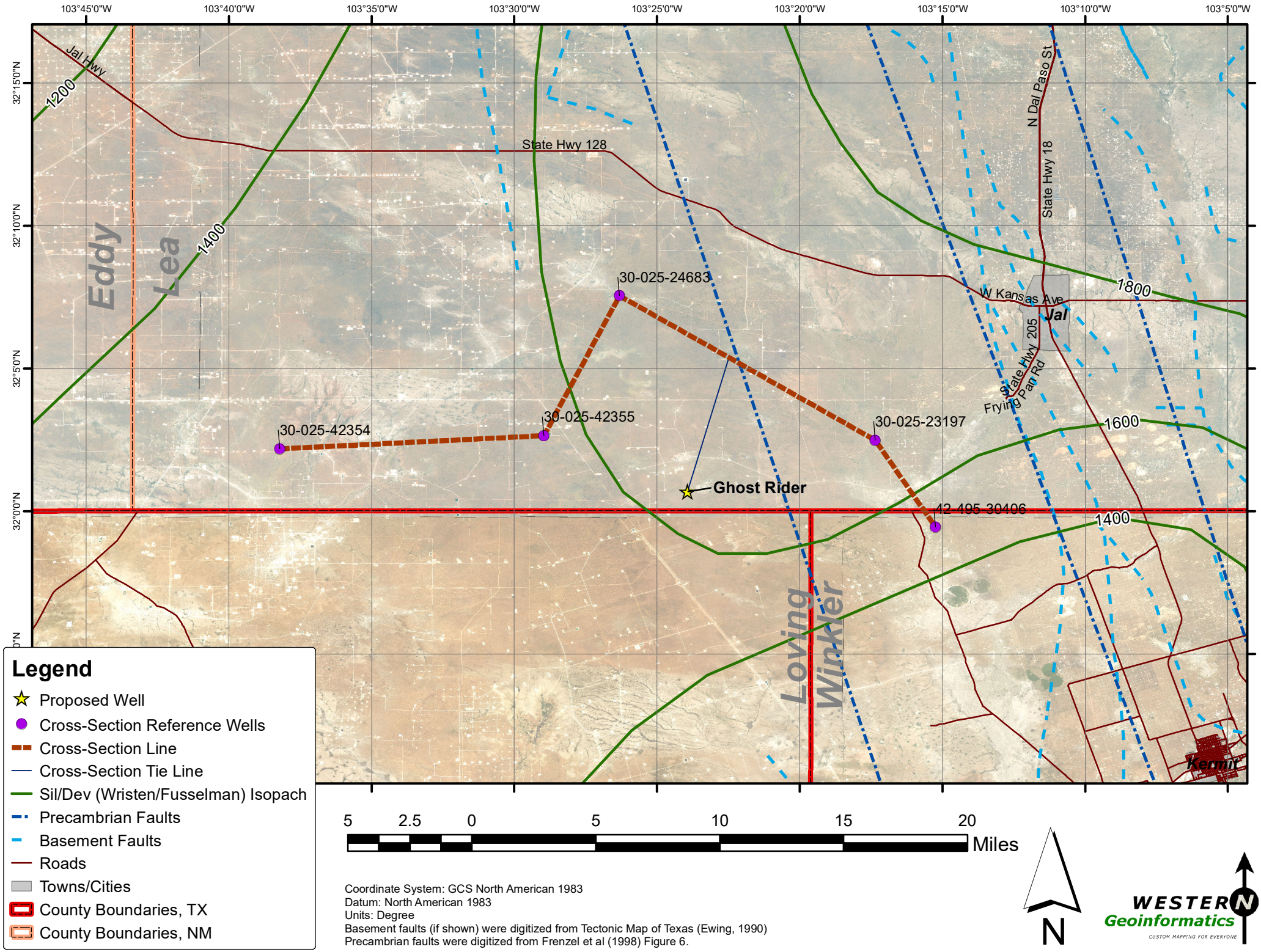
5 2.5 0 5 10 15 20 Miles

N

Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree
Basement faults (if shown) were digitized from Tectonic Map of Texas (Ewing, 1990)
Precambrian faults were digitized from Frenzel et al (1998) Figure 6.

WESTERN Geoinformatics
CUSTOM MAPPING FOR EVERYONE

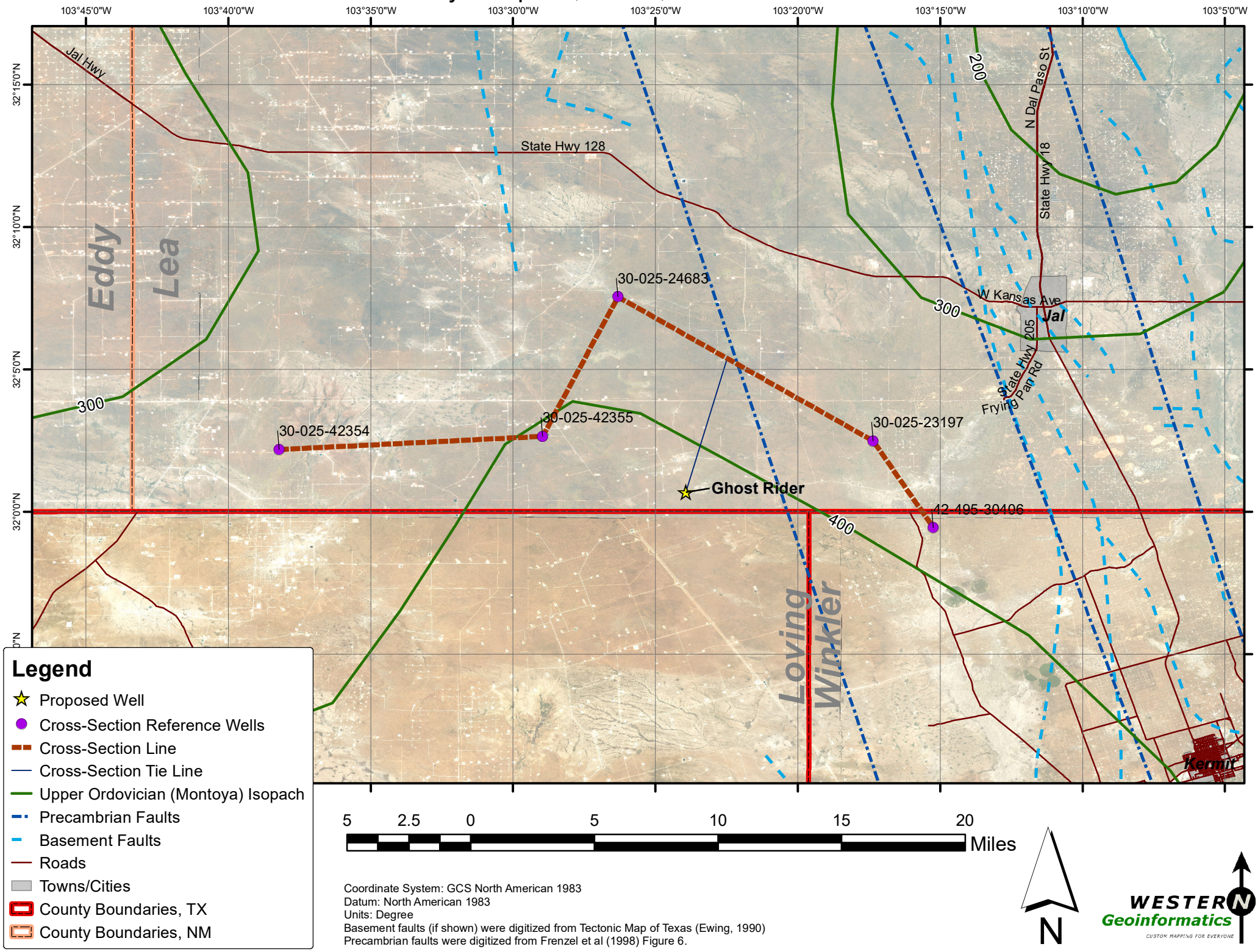
# Wristen/Fusselman Isopach, Faults, and Well Locations




Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree
Basement faults (if shown) were digitized from Tectonic Map of Texas (Ewing, 1990)
Precambrian faults were digitized from Frenzel et al (1998) Figure 6.

WESTERN Geoinformatics
CUSTOM MAPPING FOR EVERYONE

# Montoya Isopach, Faults, and Well Locations




## Legend

- Proposed Well
- Cross-Section Reference Wells
- Cross-Section Line
- Cross-Section Tie Line
- Upper Ordovician (Montoya) Isopach
- Precambrian Faults
- Basement Faults
- Roads
- Towns/Cities
- County Boundaries, TX
- County Boundaries, NM

Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree
Basement faults (if shown) were digitized from Tectonic Map of Texas (Ewing, 1990)
Precambrian faults were digitized from Frenzel et al (1998) Figure 6.

WESTERN Geoinformatics
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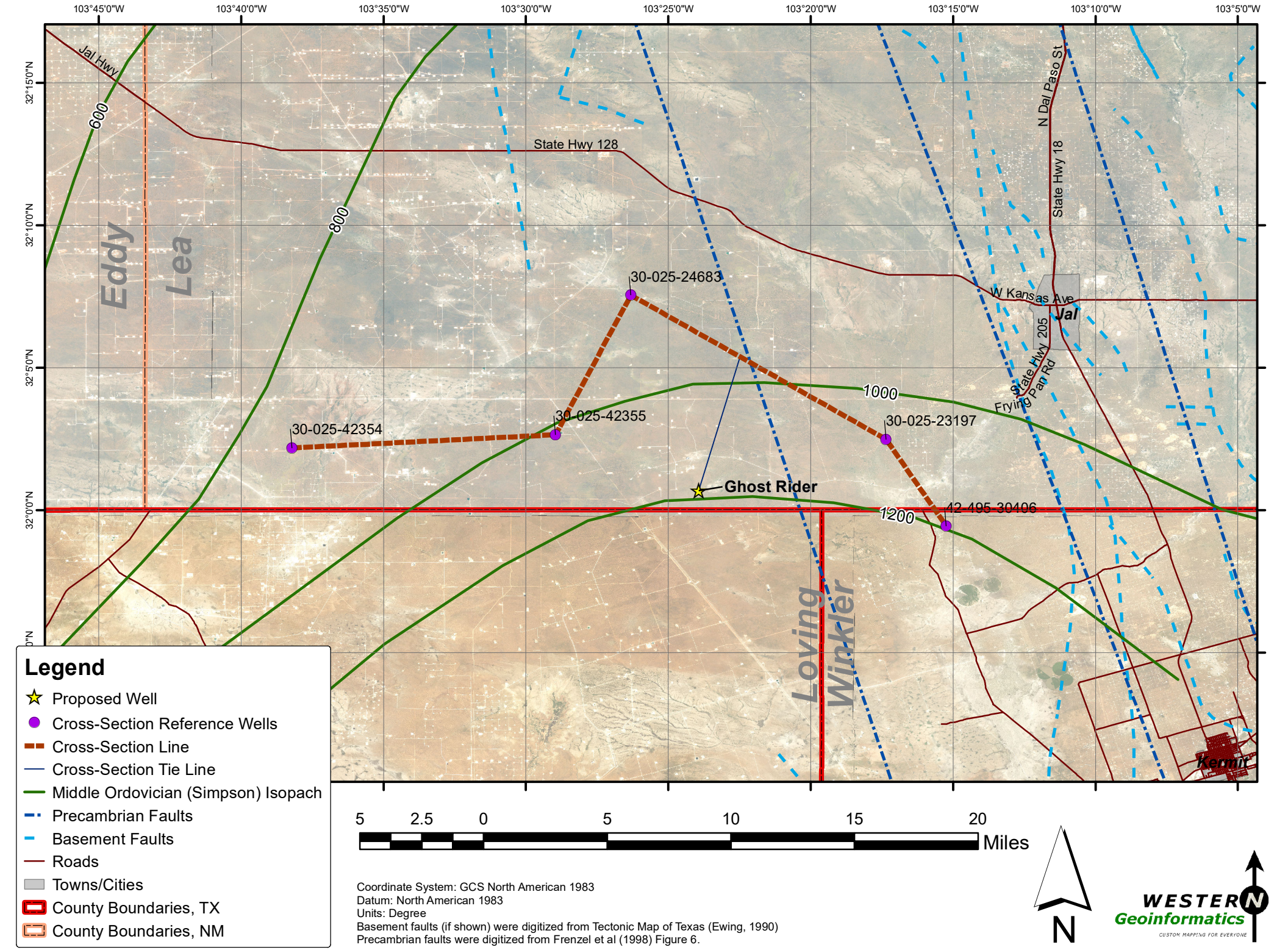
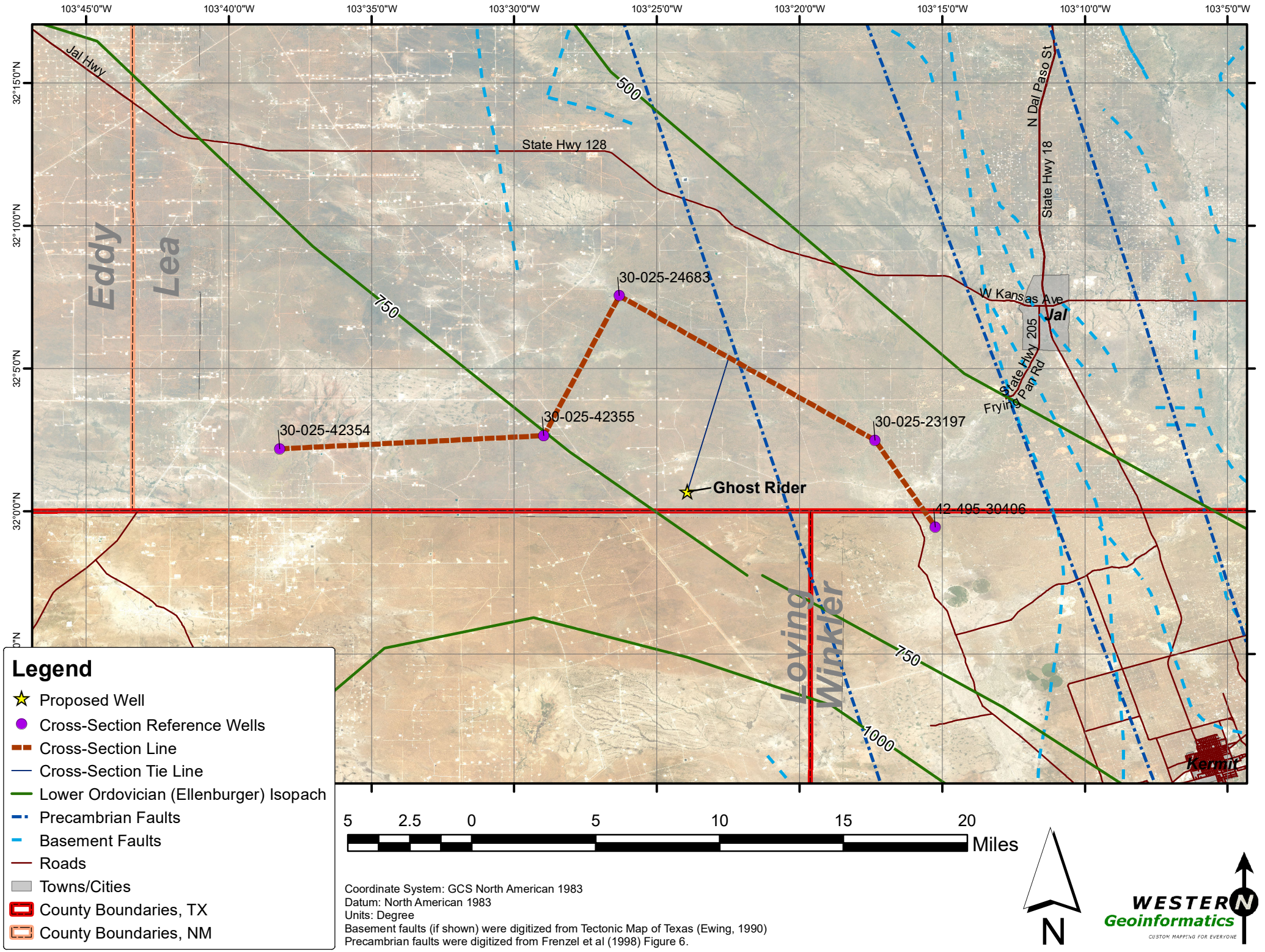
# Simpson Isopach, Faults, and Well Locations




Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree
Basement faults (if shown) were digitized from Tectonic Map of Texas (Ewing, 1990)
Precambrian faults were digitized from Frenzel et al (1998) Figure 6.

WESTERN Geoinformatics
CUSTOM MAPPING FOR EVERYONE

# Ellenburger Isopach, Faults, and Well Locations

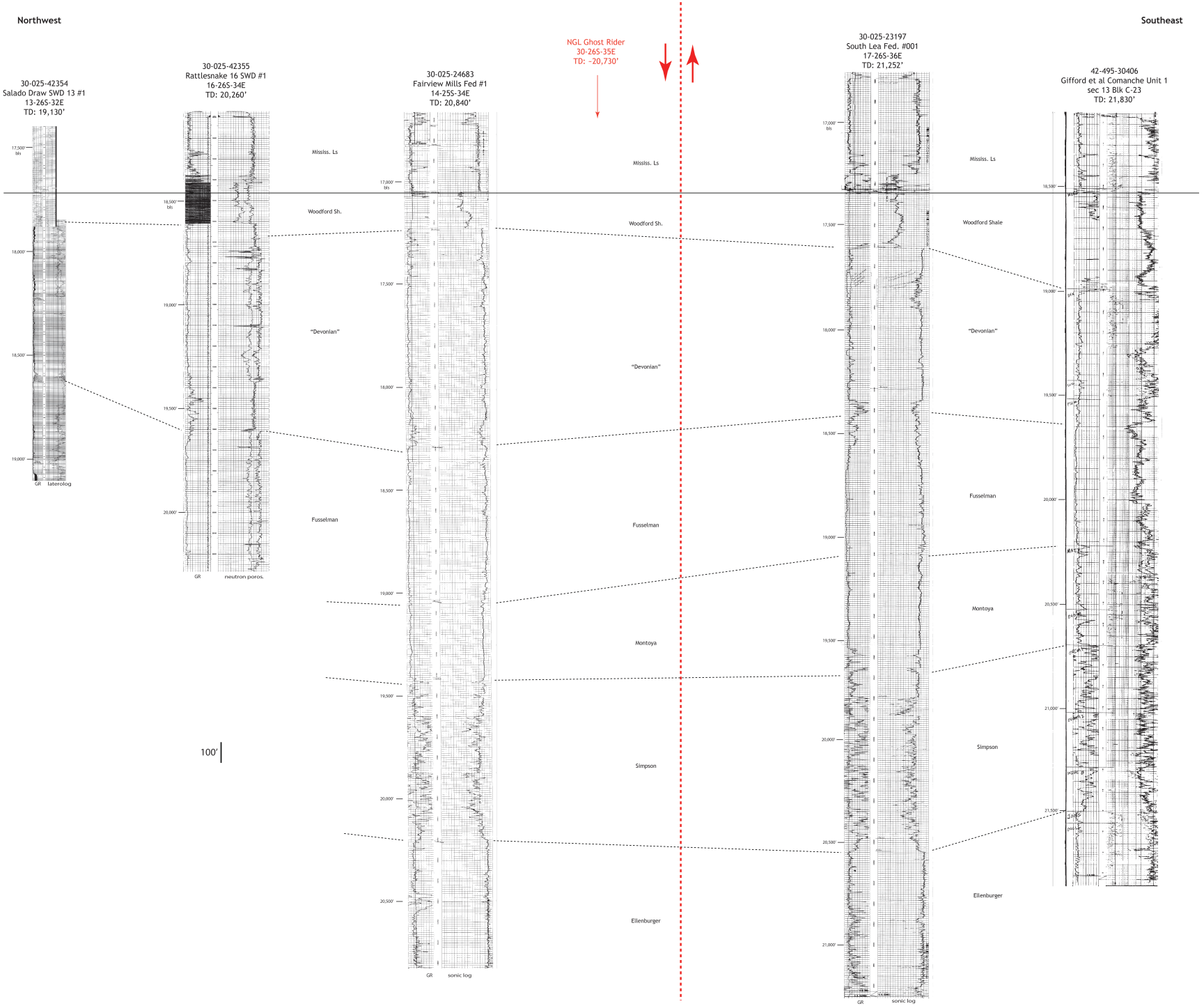



## Legend

- Proposed Well
- Cross-Section Reference Wells
- Cross-Section Line
- Cross-Section Tie Line
- Lower Ordovician (Ellenburger) Isopach
- Precambrian Faults
- Basement Faults
- Roads
- Towns/Cities
- County Boundaries, TX
- County Boundaries, NM

Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree
Basement faults (if shown) were digitized from Tectonic Map of Texas (Ewing, 1990)
Precambrian faults were digitized from Frenzel et al (1998) Figure 6.

WESTERN Geoinformatics
CUSTOM MAPPING FOR EVERYONE


Northwest
Southeast
30-025-42354
Salado Draw SWD 13 #1
13-26S-32E
TD: 19,130'
30-025-42355
Rattlesnake 16 SWD #1
16-26S-34E
TD: 20,260'
30-025-24683
Fairview Mills Fed #1
14-25S-34E
TD: 20,840'
NGL Ghost Rider
30-26S-35E
TD: ~20,730'
30-025-23197
South Lea Fed. #001
17-26S-36E
TD: 21,252'
42-495-30406
Gifford et al Comanche Unit 1
sec 13 Blk C-23
TD: 21,830'
Mississ. Ls
Woodford Sh.
"Devonian"
Fusselman
Montoya
Simpson
Ellenburger
Woodford Shale
GR
laterolog
neutron poros.
sonic log
100'

# Exhibit 4

**Dr. Steven Taylor Exhibits**

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

**APPLICATION OF NGL WATER SOLUTIONS PERMIAN, LLC FOR APPROVAL OF SALT WATER DISPOSAL WELL IN LEA COUNTY, NEW MEXICO** **Case No. 20575**

**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 chief scientist 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 NGL Water Solutions Permian, LLC ("NGL") has filed in this matter and I have conducted a study related to the area which is the subject matter of that application.

5. The applicant, NGL (OGRID No. 372338), seeks an order approving the Ghost Rider SWD #1 well. This well is a salt water disposal well.

6. In its application, NGL requests approval to use larger diameter tubing for this well which is 7" by 5 ½".

7. The well will be spaced out and not located closer than approximately 1 mile from other disposal wells approved for injection into the Devonian and Silurian formations.

8. 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.

9. The well will primarily be injecting fluids into the Wristen Group and Fusselman formations, with some fluids potentially being injected into the Upper Montoya Group. Each of these sub-formations or zones are located within what is commonly referred to by operators and the Oil Conservation Division as the "Devonian and Silurian" formations. These zones consist of a very thick sequence of limestone and dolostone that has significant primary and secondary porosity and permeability that is collectively between 1,500 to 3,000 feet thick.

10. The closest known fault line is located approximately 10 miles away from where the well is located.

11. I have studied seismic catalogs, unpublished catalogs and USGS catalogs for the time period of 2010 – 2017 selective events within 50 km of the Striker SWD wells. A copy of my study is provided in Attachment A to this affidavit. My study concludes that there is very little seismic activity in the area where the well is located.

12. I have also reviewed information provided by FTI Platt Sparks involving several different fault slip probability analyses 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 wells. A copy of the studies is included in Attachment B to this affidavit.

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

14. The granting of this application is in the interests of conservation and the prevention of waste.

*[Signature page follows]*

Steven R. Taylor
Dr. Steven Taylor

SUBSCRIBED AND SWORN to before me this 7th day of June, 2019 by Dr. Steven Taylor.

Notary Public

My commission expires: 04/08/2025

AMBER GRAVES
Comm. No. 20190609
NOTARY PUBLIC
Expires: 04/08/2025
STATE OF IDAHO

# Seismic Catalog Analysis Within 50 km of Ghost Rider SWD #1 Well

Prepared for NGL-Permian
by
GeoEnergy Monitoring Systems
June 5, 2019

Analysis is based on NMT seismic catalogs, unpublished catalogs and USGS catalogs for the time period 2010-2017 selecting events within 50 km of the Ghost Rider SWD #1 well. Additionally, seismic monitoring from September 6, 2018 to date from the three NGL seismic stations installed at Striker 2, Striker 3 and Striker 6 SWD wells. NGL/GeoEMS installed a seismic monitor at the Salty Dog SWD well (SDOG) in Texas just across New Mexico border on March 28, 2019 that will help constrain locations in southeastern NM.

Striker Two (STR2), Sand Dunes well, Lat/Long: 32.2072820/-103.7557370
Striker Three (STR3), Gossett well, Lat/Long: 32.2551110/-104.0868610
Striker Six (STR6), Madera well, Lat/Long: 32.2091150/-103.5359570
Salty Dog (SDOG), Salty Dog well, Lat/Long: 32.22531/ -103.045212

**Figure 1** shows seismic station locations with estimated detection levels for M 1.0 (green circles) and M 1.5 (red circles) along with NGL-Permian stations (yellow pushpins). **Figure 2** shows seismicity listed in Table 1 shown as red circles and additional regional stations from TexNet and NMT (green pushpins). These regional stations are used along with the 3 Striker SWD seismic stations for regional monitoring.

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

No historic or recent events have been located in the vicinity of Ghost Rider SWD #1 well.

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

| Date | Origin Time GMT | Latitude | Longitude | Depth (km) | Magnitude |
|---|---|---|---|---|---|
| 20111227 | 23:10:37 | 32.37 | -103.95 | NaN | 1.6 |
| 20120318 | 10:57:22 | 32.281 | -103.892 | 5.0 | 3.1 |
| 20170211 | 14:34:27 | 32.29 | -103.92 | NaN | 1.5 |
| 20170302 | 11:38:53 | 32.37 | -103.88 | NaN | 1.7 |
| 20170325 | 22:46:01 | 32.13 | -103.77 | NaN | 1 |

| | | | | | |
|---|---|---|---|---|---|
| 20170503 | 17:47:21 | 32.082 | -103.023 | 5.0 | 2.6 |
| 20170814 | 01:09:56 | 32.39 | -103.56 | NaN | 1.2 |

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

| Date | Origin Time (GMT) | Lat | Long | Depth | Loc Error | M | (+/-) |
|---|---|---|---|---|---|---|---|
| 09/10/18 | 23:35:43.942 | 32.1793 | -103.5283 | 1 | 5.58 | 1.25 | 0.23 |
| 09/14/18 | 06:57:47.614 | 32.1540 | -103.5030 | 1 | 5.58 | 1.11 | 0.41 |
| 09/15/18 | 16:48:21.041 | 32.1630 | -103.5211 | 1 | 5.37 | 1.50 | 0.00 |
| 10/13/18 | 22:07:22.259 | 32.0998 | -103.4560 | 6 | 5.64 | 1.60 | 0.12 |
| 11/18/18 | 09:04:52.707 | 32.2526 | -103.7853 | 5 | 3.77 | 1.75 | 0.20 |
| 12/09/18 | 18:51:00.805 | 32.3634 | -103.8510 | 1 | 2.09 | 1.44 | 0.08 |
| 01/03/19 | 09:15:48.809 | 32.2761 | -103.6732 | 6 | 5.64 | 1.63 | 0.00 |
| 01/03/19 | 23:05:33.122 | 32.2599 | -103.7654 | 4 | 5.51 | 1.60 | 0.25 |
| 01/04/19 | 09:45:38.943 | 32.2346 | -103.7798 | 4 | 4.34 | 1.98 | 0.38 |
| 01/09/19 | 10:18:54.389 | 32.2255 | -103.7166 | 5 | 2.80 | 1.47 | 0.41 |
| 01/27/19 | 07:33:47.127 | 32.2219 | -103.7220 | 5 | 3.53 | 1.72 | 0.31 |
| 02/19/19 | 09:35:15.109 | 32.2443 | -103.6898 | 1 | 4.17 | 1.20 | 0.00 |
| 05/23/19 | 06:33:40.530 | 32.2617 | -103.7581 | 4 | 2.28 | 1.53 | 0.27 |

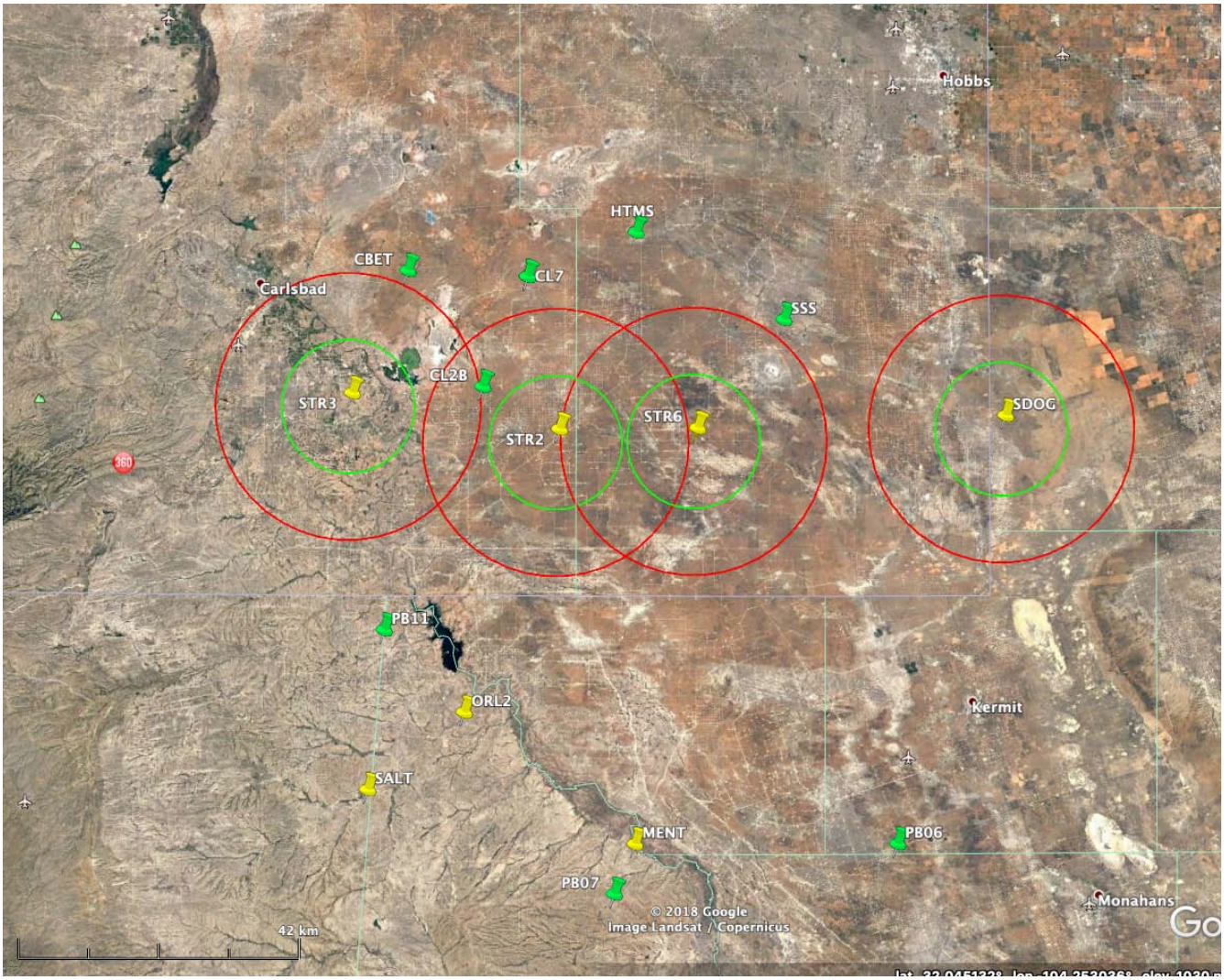



**Figure 1.** Striker SWD wells seismic station locations and existing NGL-Permian seismic stations (yellow pushpins). Green and red circles around stations show approximate detection levels for ML 1.0 and 1.5, respectively.

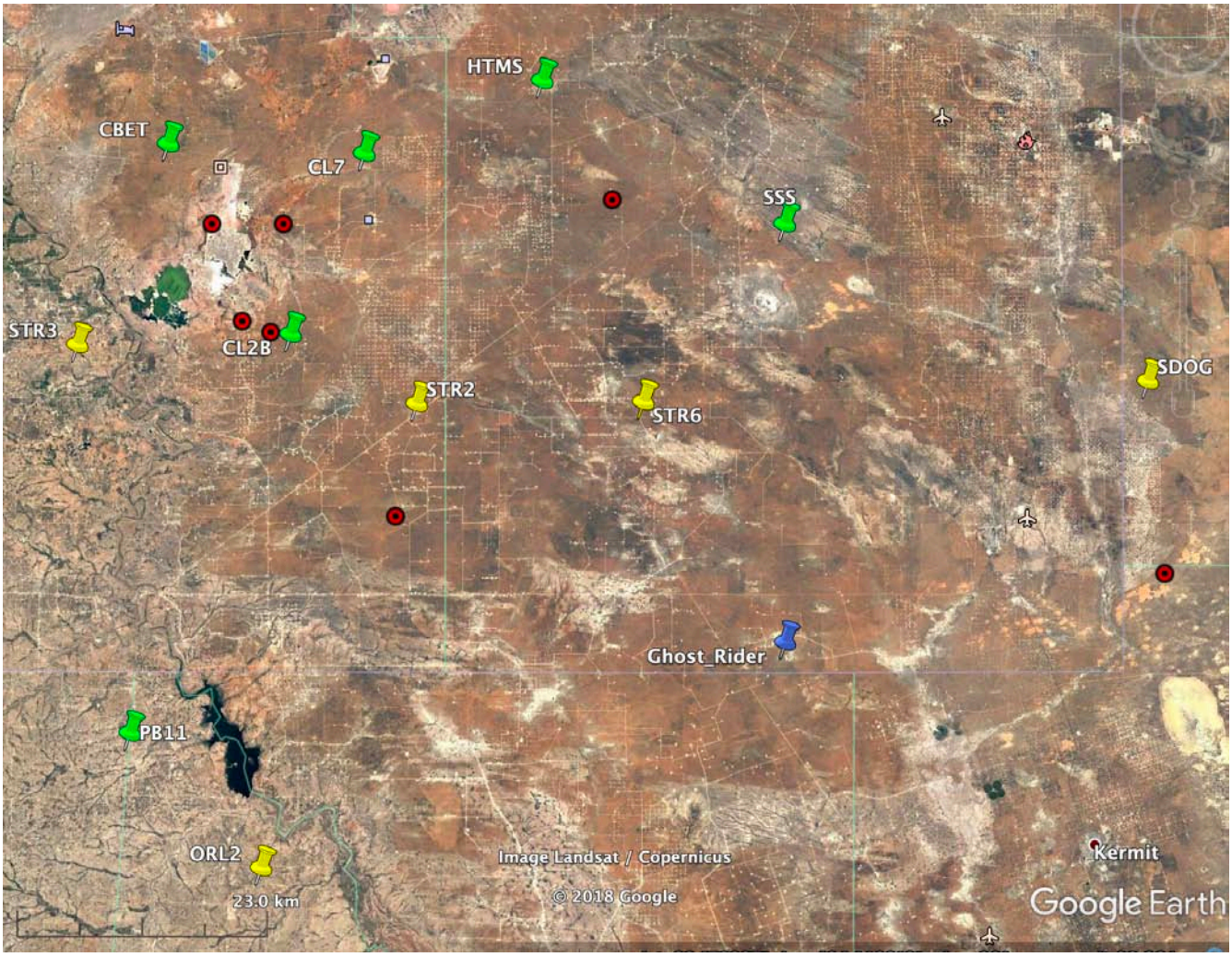



**Figure 2.** Striker SWD wells seismic station locations (yellow push pins) and existing NGL-Permian seismic stations (yellow pushpins). Other regional seismic stations run by TexNet and New Mexico Tech are shown as green pushpins. Historic seismicity listed in Table 1 shown as red circles. Ghost Rider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

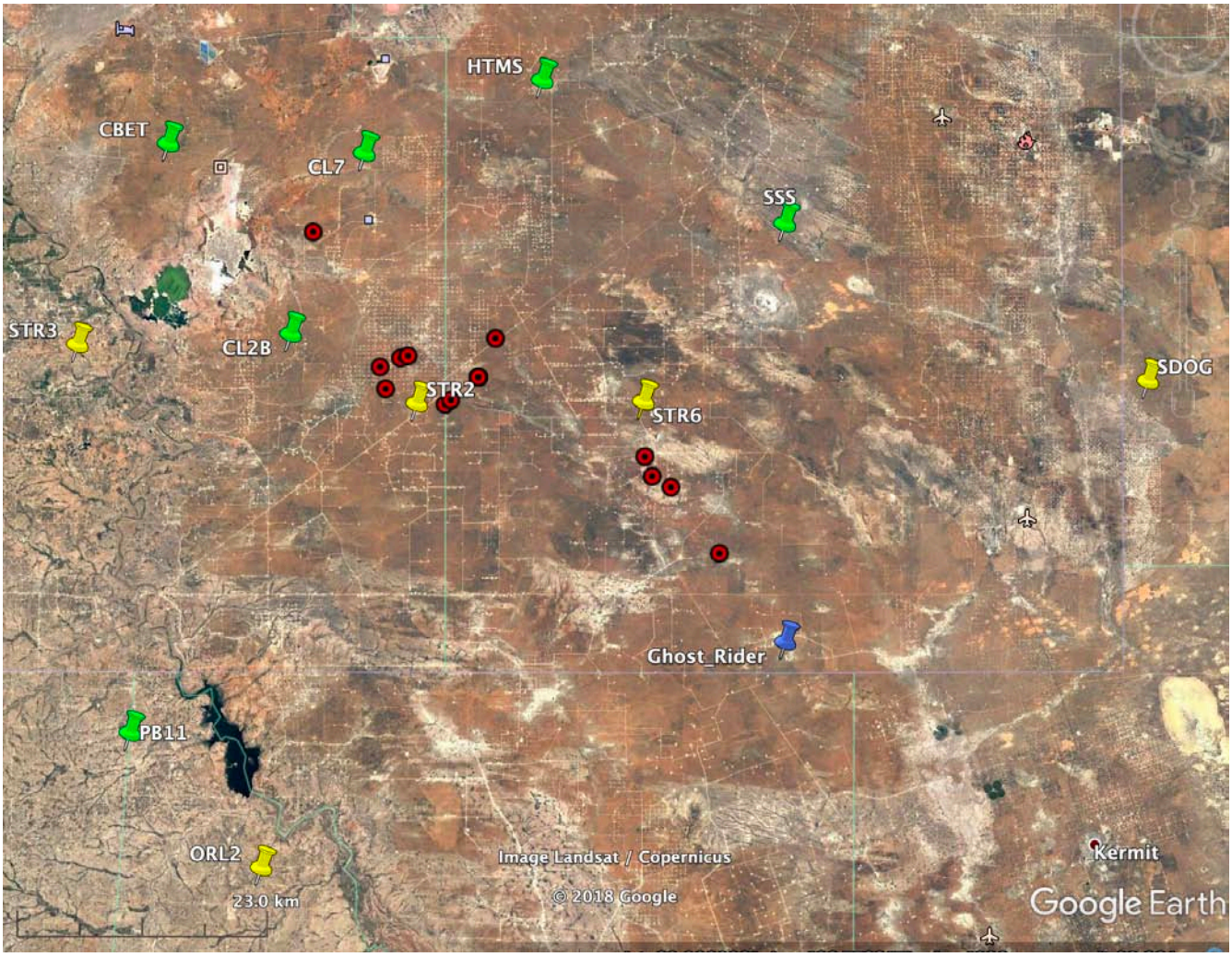



**Figure 3**. Seismic events in between September 6, 2018 to date as red circles (Table 2). Seismic stations as yellow (NGL) or green (NMT and TexNet) pushpins. Ghost Rider SWD well shown as blue pushpin.

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Texas Registered Engineering Firm No F – 16381

June 12, 2019

RE: Application for Fluid Injection or Disposal Permit
NGL Water Solutions Permian, LLC
Ghost Rider SWD #1
Lea County, New Mexico

**FSP Analysis (Fault slip potential)**

I have reviewed the geology and seismic activity near the Ghost Rider SWD #1 and I would conclude that this well does not pose a risk related to seismicity in this area. The Area of review (AOR) and subject well are shown on **(FSP Exh. 2)** in relation to the historical earthquake events in the area. (USGS) (None within the AOR).

** 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.*

**FSP Methodology**

- FSP input variables were determined from nearby Deep injection wells in the review area and published data. (**FSP Exh.1**)
- Stress gradients and pore pressure gradients were derived from testing and published papers (**FSP Exh.1**).
- Fault slip potential (FSP) was analyzed in the area of review shown on **FSP Exh.2.** 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 (none in the AOR).
- Azimuth direction of $S_{hmax}$ was derived from Snee/Zoback 2018. (**FSP Exh.3**)
- Viscosity of the formation fluid was derived from temperature values at the mid-point injection depth (**FSP Exh.4**)

- The wells input into the FSP model and the potential faults in the area are shown on **FSP Exh. 5.**
    - Existing injection wells are projected into the future at the last reported injection volume and then held constant.
    - The subject well is tested at the proposed maximum injection rate and held constant for 20 years. If the ΔP at the well exceeds the allowed injection pressure, then the modelled injection rates are decreased over time to stay within the allowed maximum injection pressure. This analysis is important because the model should represent realistic injection values over the life of the model and arbitrarily using the permitted rate over the life of the well does not reflect the reality that as the reservoir pressure increases the well's ability to inject fluid may be reduced.
    - The Subject well is denoted in the model as follows:
        - 12 – Ghost Rider SWD #1 (40,000 bbls/d)
    - Also included in the model are existing SWD injection wells as follows:
        - 1 – 3002512014 – injection reported (last reported rate held constant)
        - 2 – 3002527085 – injection reported (last reported rate held constant)
        - 3 – 3002542054 – no injection to date (30,000 bbls/d)
        - 4 – 3002542355 – injection reported (last reported rate held constant)
        - 5 – 3002543360 – no injection to date (30,000 bbls/d)
        - 6 – 3002544954 – no injection to date (30,000 bbls/d)
        - 7 - 3002545151 – no injection to date (30,000 bbls/d)
        - 8 - 3002545346 – no injection to date (30,000 bbls/d)
        - 9 - 3002545795 – no injection to date (30,000 bbls/d)
        - 17 – West Jal B Deep #1 – no injection to date (30,000 bbls/d)
        - And these other pending NGL well locations
        - 10 – Cobra SWD #1 (40,000 bbls/d)
        - 11 - Galaxy SWD #1 (40,000 bbls/d)
        - 13 – Hornet SWD #1 (40,000 bbls/d)
        - 14 – Raptor SWD #1 (40,000 bbls/d)
        - 15 – Thunderbird SWD #1 (40,000 bbls/d)

    - 16 – Thunderbolt SWD #1 (40,000 bbls/d)

- **FSP Exh.6** shows the geomechanical properties of the possible faults (with segment numbers).
- **FSP Exh.7** shows the pressure to slip, ΔP, at each possible fault segment.
- **FSP Exh.8** shows the probability of fault slip for each fault segment and shows that a ΔP 3,500 psi increase at segment F16 shows a 10% probability of fault slip. The model calculates a ΔP increase of 317 psi at F16 by 2045 thus the calculated pressures remain well below the 10% probability level. (See FSP Exh. 12)
- **FSP Exh.9 - FSP Exh.11** show the calculated pressures at the possible fault segments as of 1/1/2025, 1/1/2035, and 1/1/2045. Note that by 2045 none of the faults have reached pressures that would initiate fault slip.
- **FSP Exh.12** shows the pressure recap for all of the modelled fault segments as of 2045 and the corresponding pressures required to cause fault slip. Also shown are the sources of the fault segments included in the model and the depths where fault displacement can be demonstrated.

## FSP Analysis (Findings and Conclusions)

The N-S faults and fault trends in this area of review are not optimally oriented to slip. The orientation of the faults requires significant pressure changes (ΔP +4,400 psi) based on the fixed input parameters the ΔP increase at the most critical fault only reaches 317 psi by 2045.

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 modelled values, then the risk for fault slip is lowered.

In the event 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. At this time there is no evidence to support rate reduction for any of the existing or proposed wells.

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

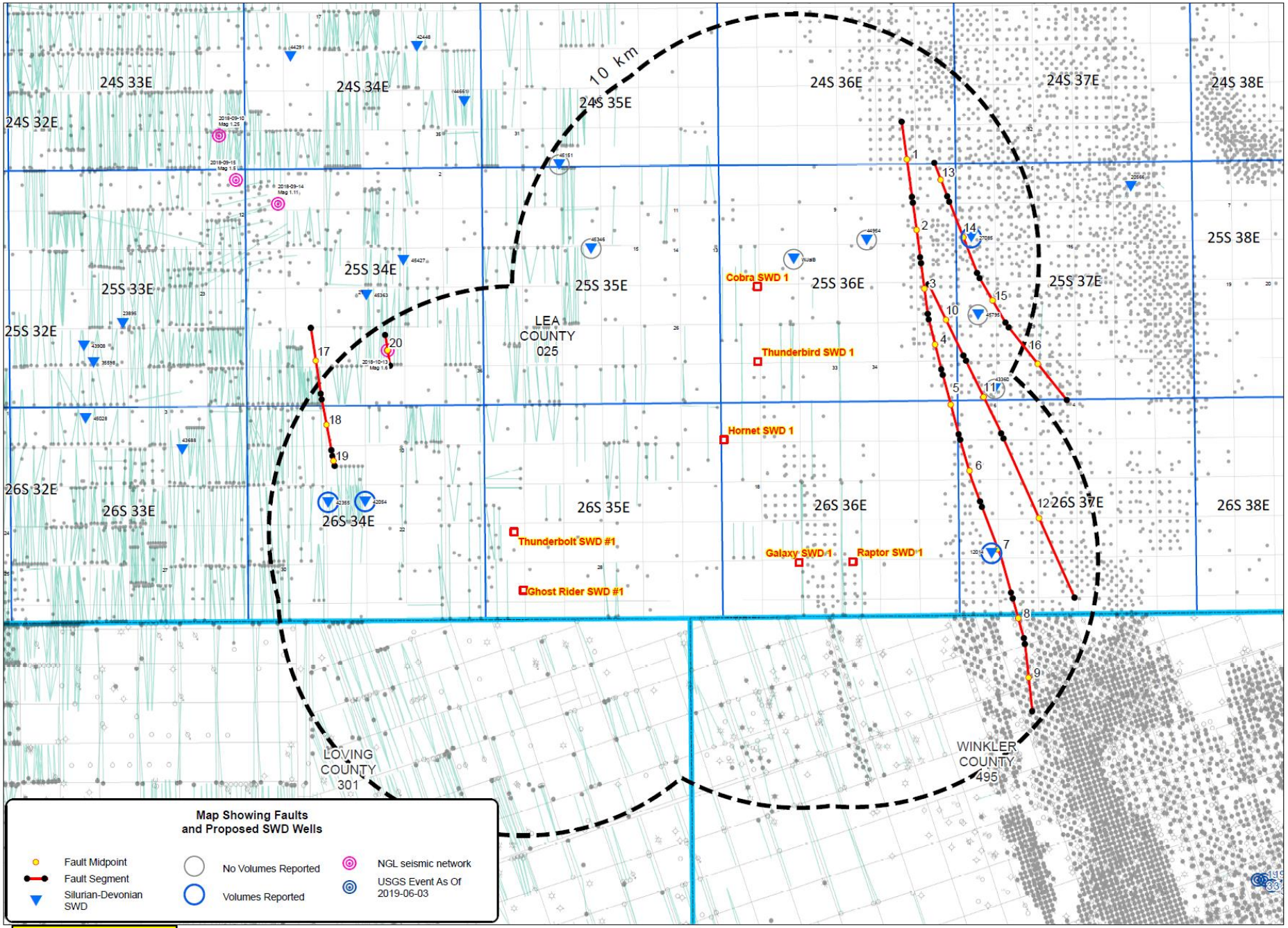

**FTI Platt Sparks**

512.327.6930 office

## FSP DATA WORKSHEET (General information and Input data)

| | | Comments | Variance (+/-) |
|---|---|---|---|
| **Well** | **Ghost Rider SWD #1** | | |
| **Operator** | NGL Water Solutions Permian, LLC | | |
| **API** | | | |
| **Top Injection Depth (ft)** | 18953 | | |
| **Base Injection Depth(ft)** | 20729 | | |
| **Mid Injection Depth(ft)** | 19841 | | |
| **Mid Injection Depth(m)** | 6047 | | |
| **Injection Formation(s)** | Siluro-Devonian, Fusselman | | |
| **Est Formation Temp (F)** | 284 | *Temp graphs (UTPB 2006)* | |
| **Est Formation Temp (C)** | 140 | *Temp graphs (UTPB 2006)* | |
| **Density (kg/m3)** | 1000 | *Estimated* | 40 |
| **Viscosity (Pa.s)** | 0.00025 | *Calculated* | 0.00005 |
| **Compressibility-Formation (1/Pa)** | 8.70E-10 | *Estimated* | |
| **Compressibility-Fluid (1/Pa)** | 4.57E-10 | *Estimated* | |
| **Aquifer thickness (ft)** | 888 | | 50 |
| **Porosity (%)** | 5 | | 2 |
| **Perm (mD)** | 20 | | 4 |
| **Vertical stress grad. (psi/ft)** | 1.1 | *Calculated from density log* | 0.05 |
| **Min. Horiz. Stress grad. (psi/ft)** | 0.67 | *Determined from A Phi parameter (0.6)* | 0.02 |
| **Max. Horiz. Stress grad. (psi/ft)** | 0.92 | *Determined from A Phi parameter (0.6)* | 0.02 |
| **Initial Pore Pressure grad. (psi/ft)** | 0.46 | *Normal saltwater pore pressure gradient* | 0.01 |
| **Azimuth of Max Horiz Stress (deg)** | 75 | *From Snee/Zoback* | 5 |
| **Fault Orientation (deg)** | Dependent on Fault | | 5 |
| **Fault Dip (deg)** | 85 | | 5 |
| **Friction of Coefficient** | 0.6 | *typical for pre-existing fault/facture* | 0.02 |
| **Max Injection pressure @ 0.20 psi/ft** | 3791 | | |
| **Max Injection rate (bbls/day)** | 40000 | | |

FSP Exh. 1




FSP Exh. 2

_FaultSeg_NM.mxd

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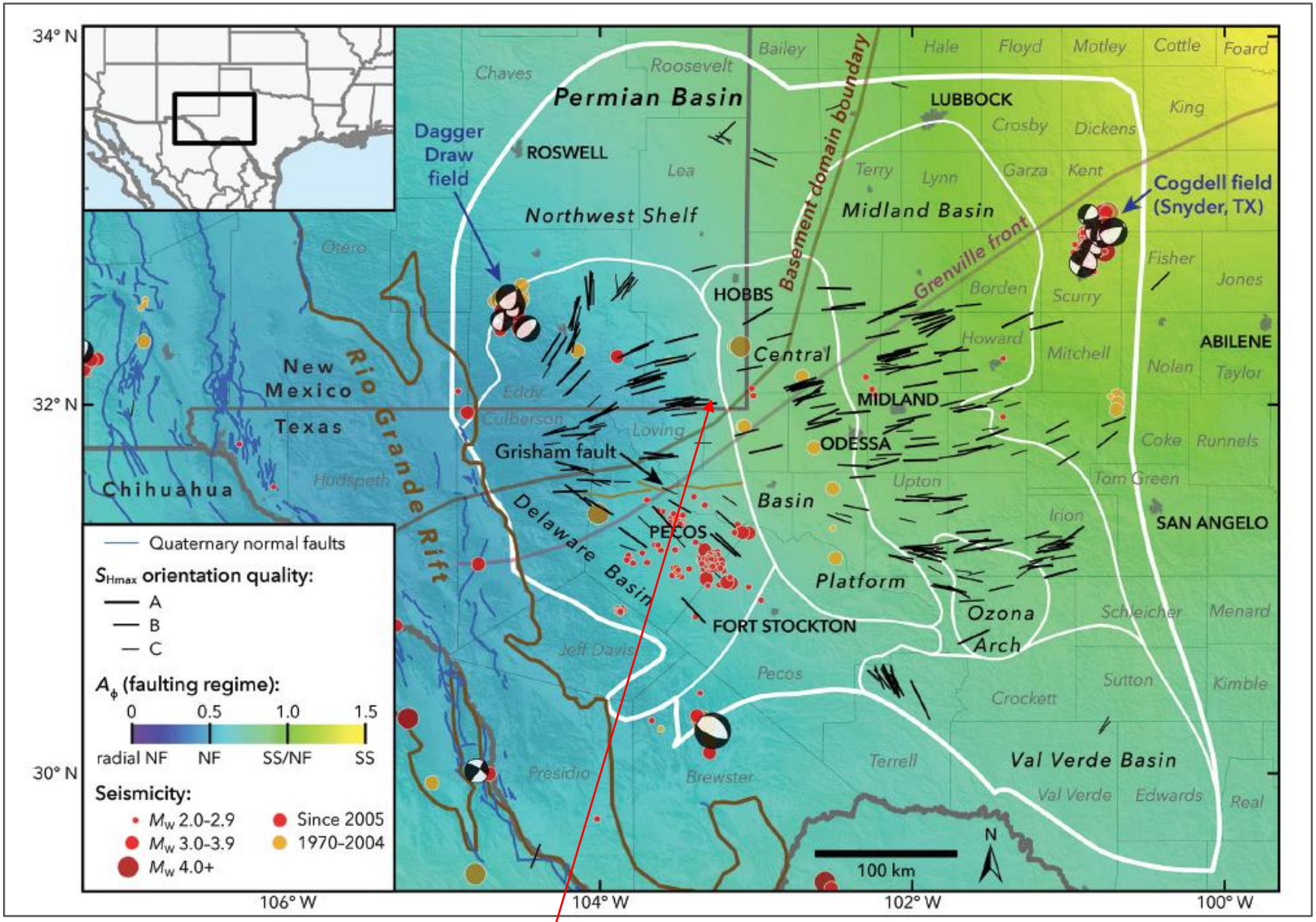



FSP Exh. 3

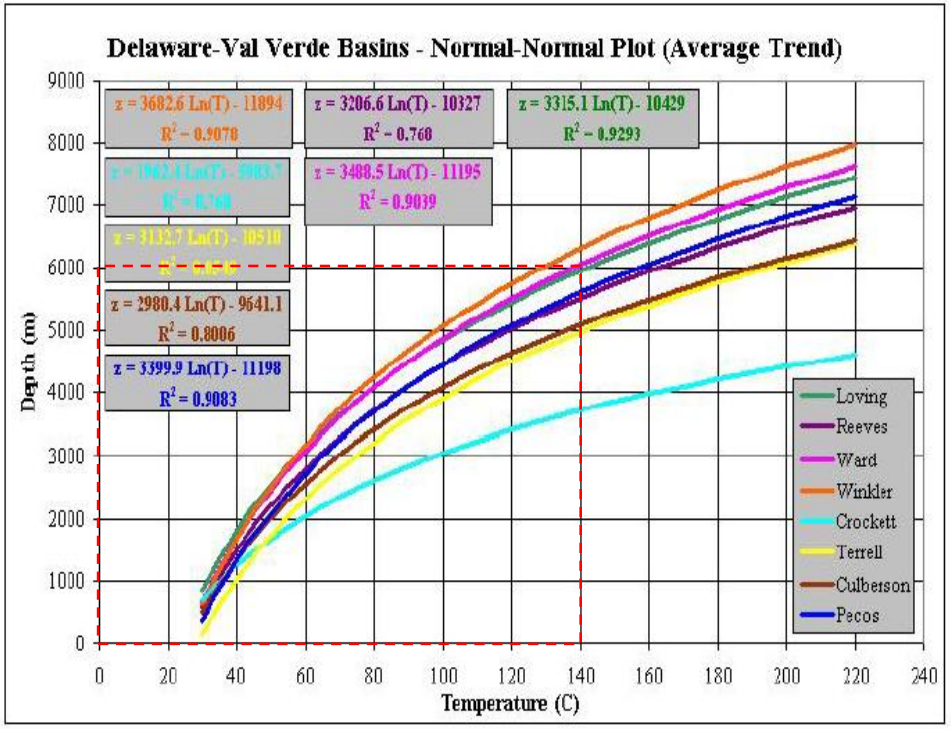
**Stress Data Inputs**

**80**

**Azimuth $S_{hmax}$**

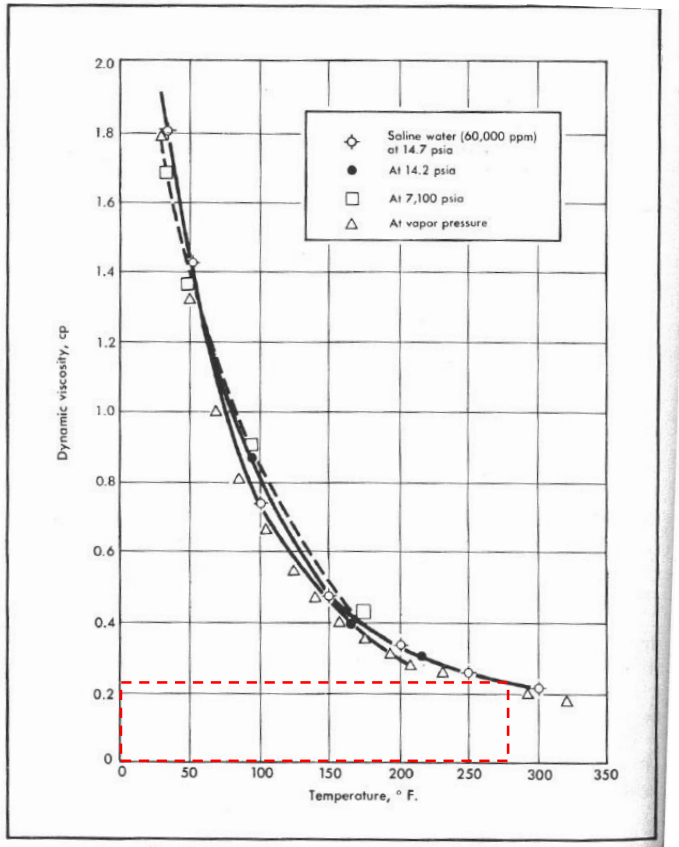
**Subject Area**

# Determination of Viscosity




A

140 (C)
284 (F)




25 cp

FIG. 6–9. Viscosity of water at oil-field temperature and pressure. (Van Wingen, *Secondary Recovery of Oil in the United States*, API, 1950, 127, with permission).

FSP Exh. 4

Fault Slip Potential v1.07

File Data Inputs Export Image Zoom

# Fault Slip Potential

MODEL INPU... | GEOMECHANICS | PROB. GEOMECH | HYDROLOGY | PROB. HYDRO | INTEGRATED

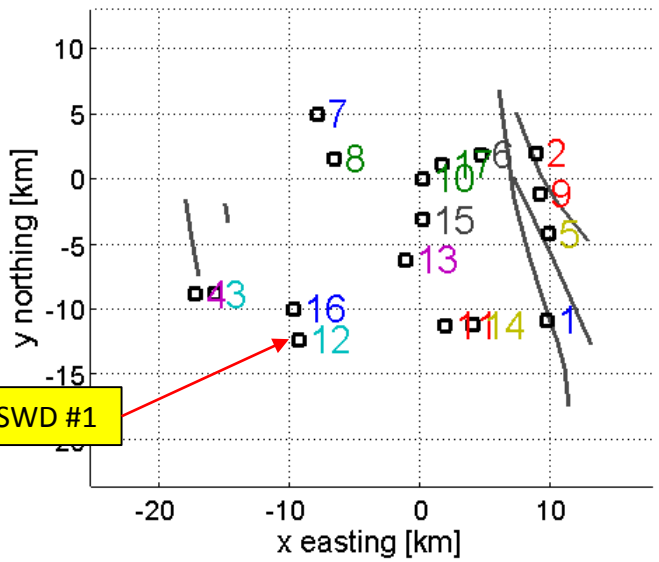
Fault Selector:

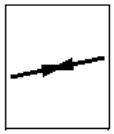
- All Faults
- Fault #1
- Fault #2
- Fault #3
- Fault #4
- Fault #5
- Fault #6
- Fault #7
- Fault #8
- Fault #9
- Fault #10
- Fault #11
- Fault #12
- Fault #13
- Fault #14
- Fault #15
- Fault #16
- Fault #17
- Fault #18
- Fault #19
- Fault #20

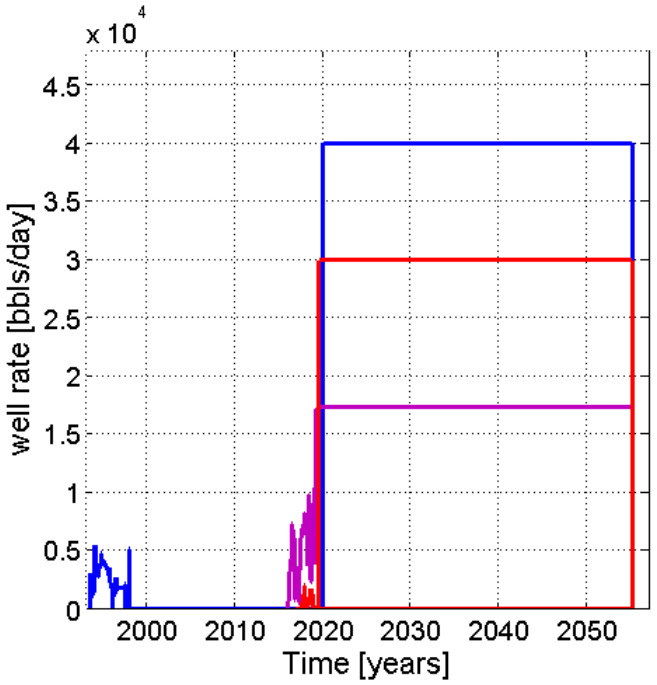
Calculate

Stress Regime: Normal Faulting

Select Well: All






Subject well: Ghost Rider SWD #1

Subject Well input at 40,000 bbls/day beginning rate
16 other injection wells in area of study

FSP Exh. 5

Fault Slip Potential v1.07

File Data Inputs Export Image Zoom

# Fault Slip Potential

MODEL INPUTS | GEOMECHA... | PROB. GEOMECH | HYDROLOGY | PROB. HYDRO | INTEGRATED

Fault Selector:

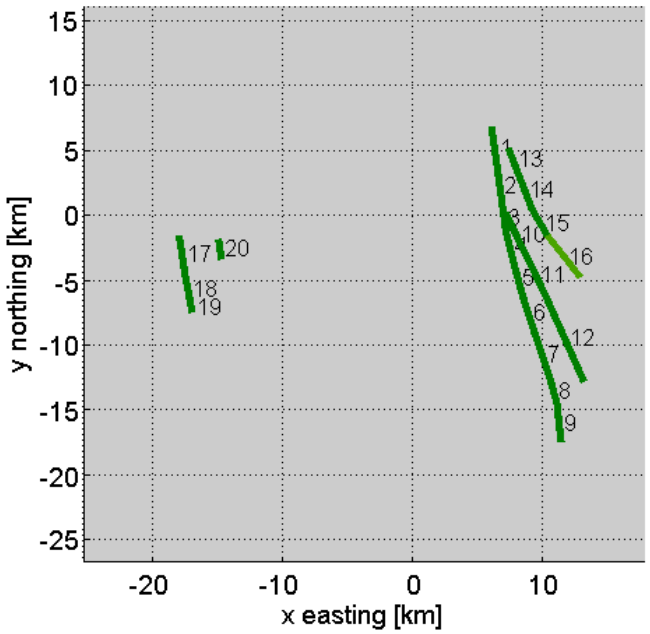
All Faults
Fault #1
Fault #2
Fault #3
Fault #4
Fault #5
Fault #6
Fault #7
Fault #8
Fault #9
Fault #10
Fault #11
Fault #12
Fault #13
Fault #14
Fault #15
Fault #16
Fault #17
Fault #18
Fault #19
Fault #20

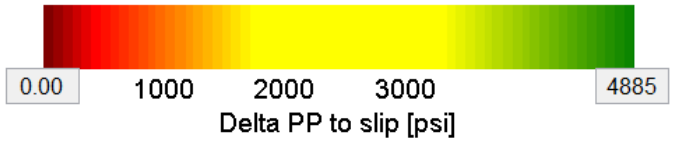
Calculate

a) Fault Number

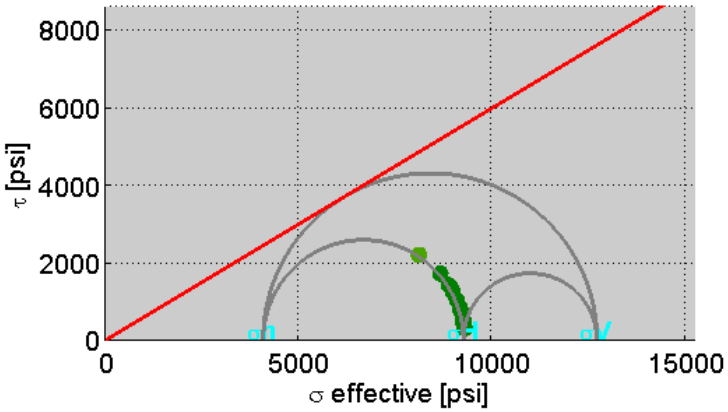
Help

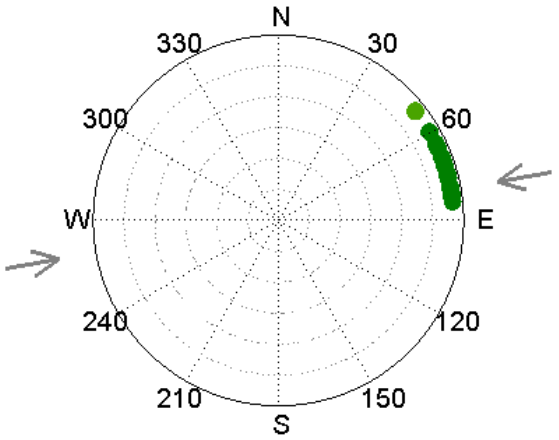
**Fault segment numbers**




Stress Regime: Normal Faulting



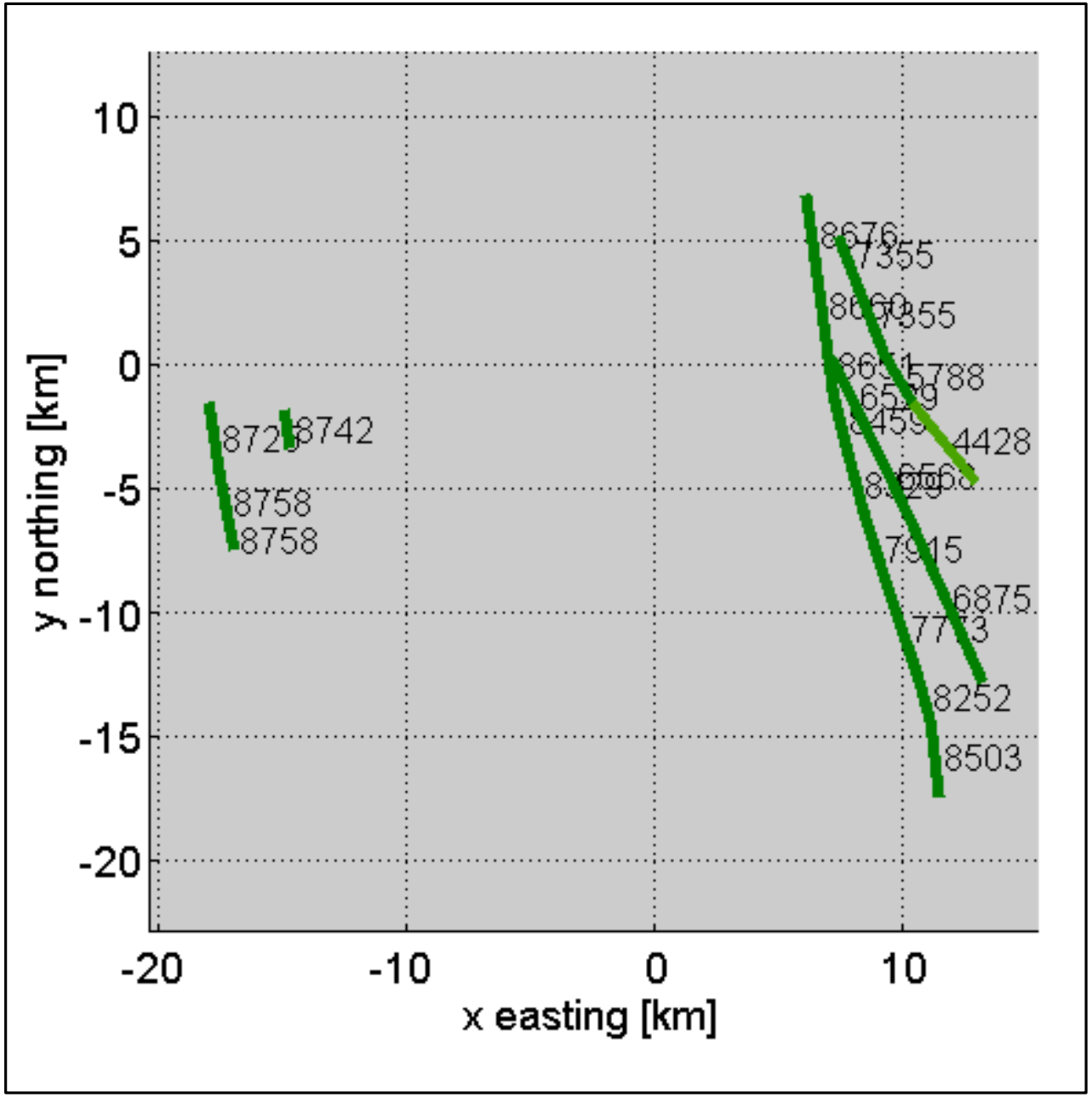

Stereonet Show: Fault Normals

FSP Exh. 6

**Calculated Pore Pressure to Slip**

**ΔP**

**At each fault segment**




FSP Exh 7

Fault Slip Potential v1.07

File Data Inputs Export Image Zoom

# Fault Slip Potential

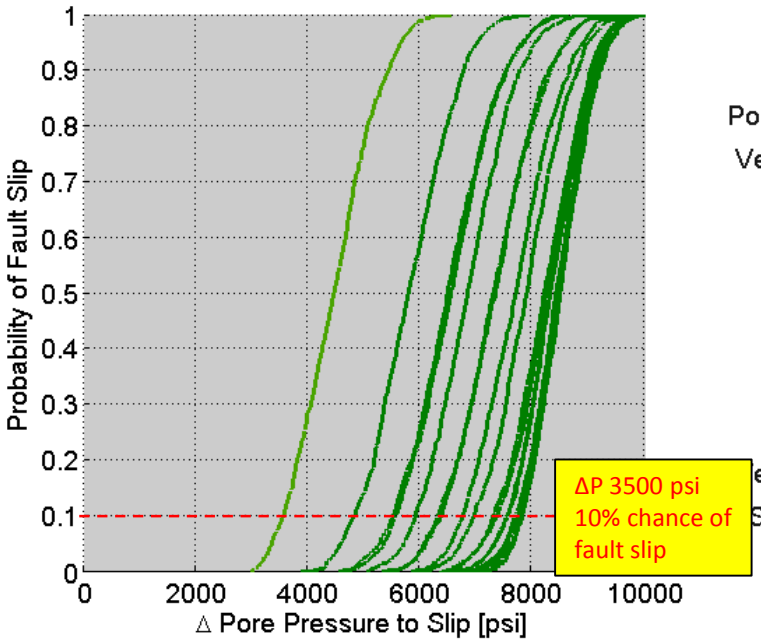
MODEL INPUTS | GEOMECHANICS | PROB. GEOM... | HYDROLOGY | PROB. HYDRO | INTEGRATED

Fault Selector:

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

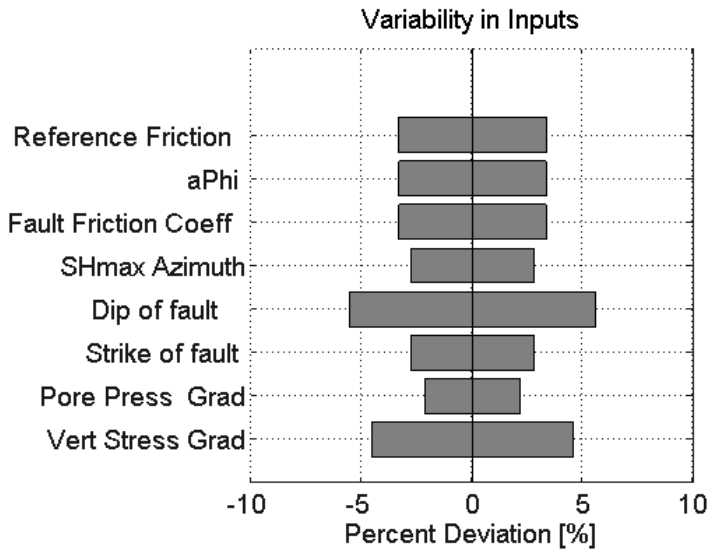
Calculate

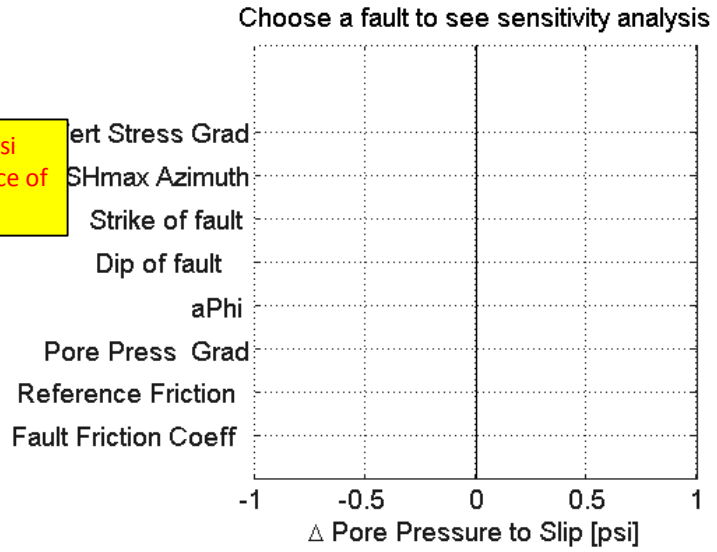
Load Distributions | Run Analysis




Max Delta PP [psi]: 10000

Export CDF data | Show Input Distributions




FSP Exh. 8

Fault Slip Potential v1.07

File Data Inputs Export Image Zoom

# Fault Slip Potential

MODEL INPUTS | GEOMECHANICS | PROB. GEOMECH | HYDROLOGY | PROB. HYDRO | INTEGRATED

Fault Selector:

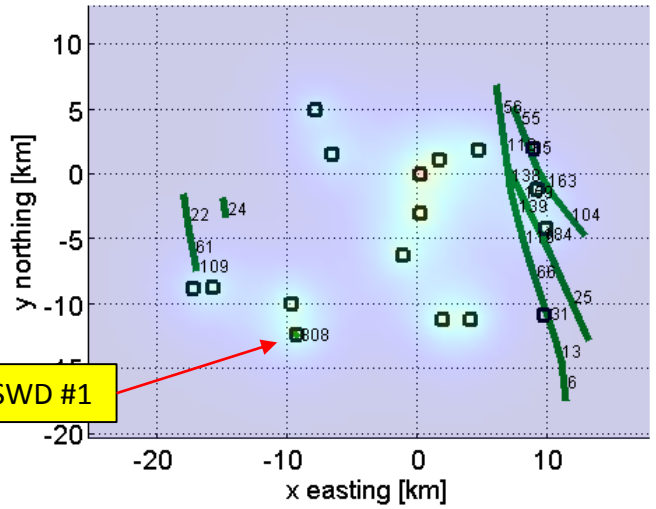
All Faults
Fault #1, 0.00 FSP
Fault #2, 0.00 FSP
Fault #3, 0.00 FSP
Fault #4, 0.00 FSP
Fault #5, 0.00 FSP
Fault #6, 0.00 FSP
Fault #7, 0.00 FSP
Fault #8, 0.00 FSP
Fault #9, 0.00 FSP
Fault #10, 0.00 FSP
Fault #11, 0.00 FSP
Fault #12, 0.00 FSP
Fault #13, 0.00 FSP
Fault #14, 0.00 FSP
Fault #15, 0.00 FSP
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

Calculate

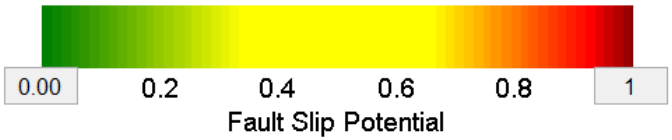
Export

b) PP Change at fault [psi]

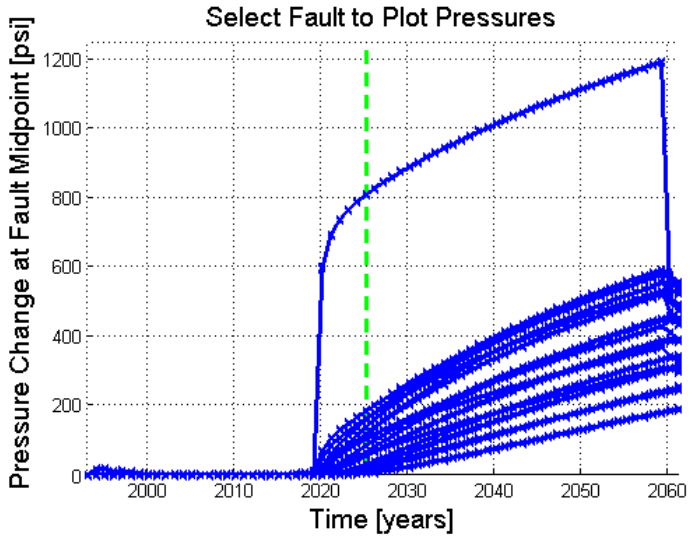
Summary Plots



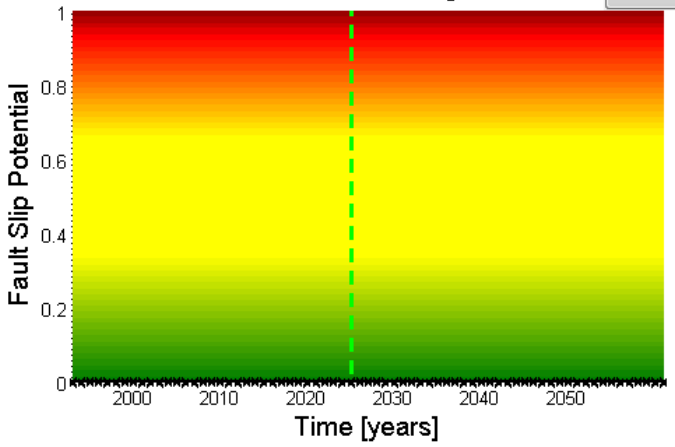

Subject well: Ghost Rider SWD #1




Year: 2025




Export




FSP Exh. 9

Fault Slip Potential v1.07

File Data Inputs Export Image Zoom

# Fault Slip Potential

MODEL INPUTS | GEOMECHANICS | PROB. GEOMECH | HYDROLOGY | PROB. HYDRO | INTEGRATED

Fault Selector:

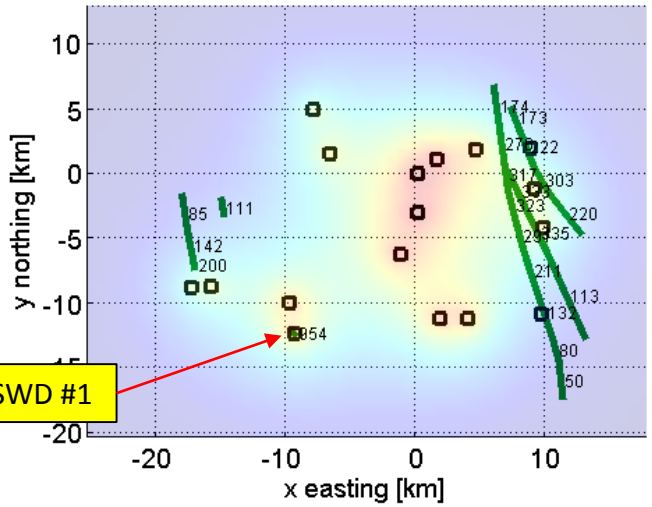
All Faults
Fault #1, 0.00 FSP
Fault #2, 0.00 FSP
Fault #3, 0.00 FSP
Fault #4, 0.00 FSP
Fault #5, 0.00 FSP
Fault #6, 0.00 FSP
Fault #7, 0.00 FSP
Fault #8, 0.00 FSP
Fault #9, 0.00 FSP
Fault #10, 0.00 FSP
Fault #11, 0.00 FSP
Fault #12, 0.00 FSP
Fault #13, 0.00 FSP
Fault #14, 0.00 FSP
Fault #15, 0.00 FSP
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

Calculate

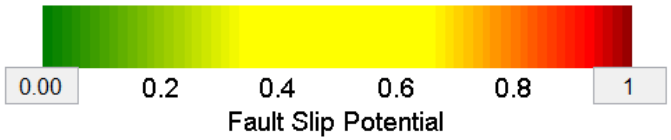
Export

b) PP Change at fault [psi]

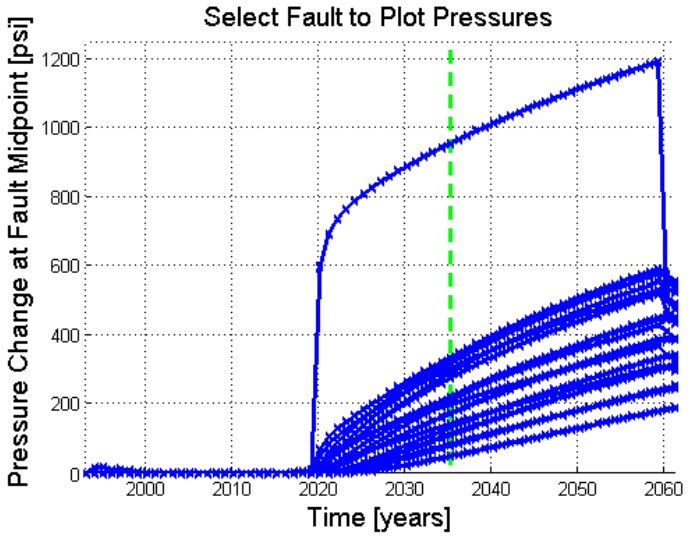
Summary Plots



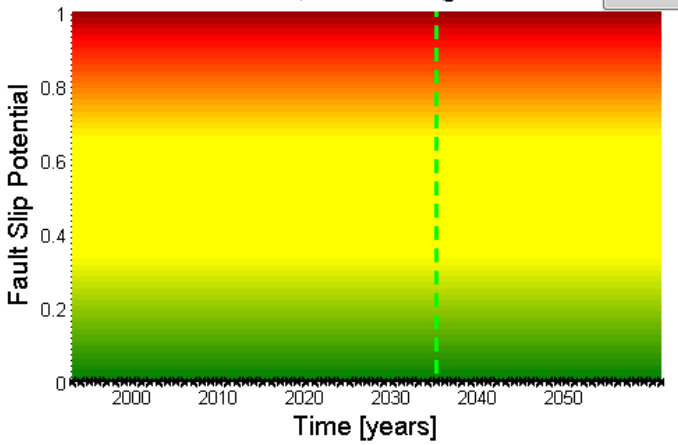

Subject well: Ghost Rider SWD #1




Year: 2035




Export




FSP Exh. 10

Fault Slip Potential v1.07

File Data Inputs Export Image Zoom

# Fault Slip Potential

MODEL INPUTS | GEOMECHANICS | PROB. GEOMECH | HYDROLOGY | PROB. HYDRO | INTEGRATED

Fault Selector:

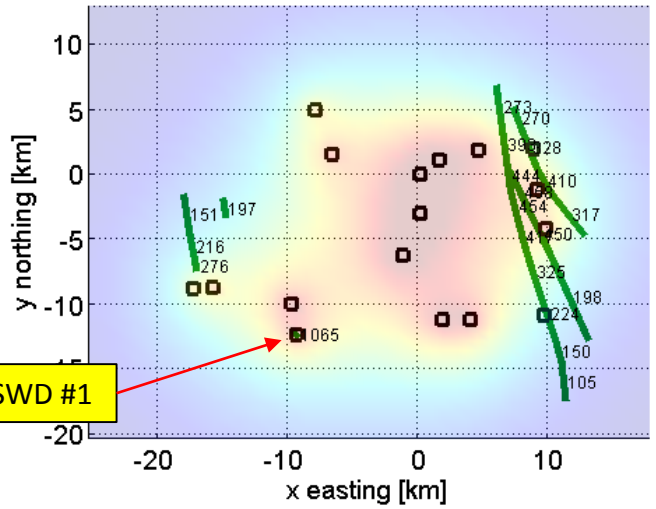
All Faults
Fault #1, 0.00 FSP
Fault #2, 0.00 FSP
Fault #3, 0.00 FSP
Fault #4, 0.00 FSP
Fault #5, 0.00 FSP
Fault #6, 0.00 FSP
Fault #7, 0.00 FSP
Fault #8, 0.00 FSP
Fault #9, 0.00 FSP
Fault #10, 0.00 FSP
Fault #11, 0.00 FSP
Fault #12, 0.00 FSP
Fault #13, 0.00 FSP
Fault #14, 0.00 FSP
Fault #15, 0.00 FSP
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

Calculate

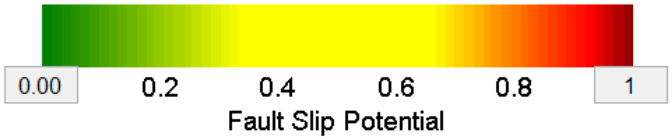
Export

b) PP Change at fault [psi]

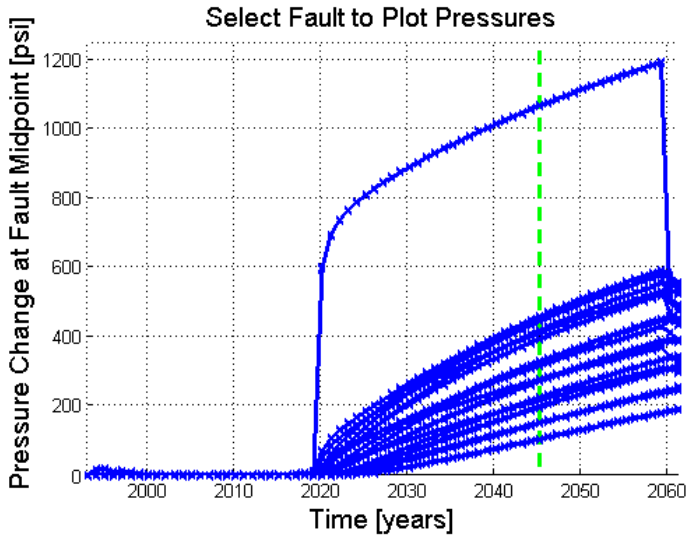
Summary Plots



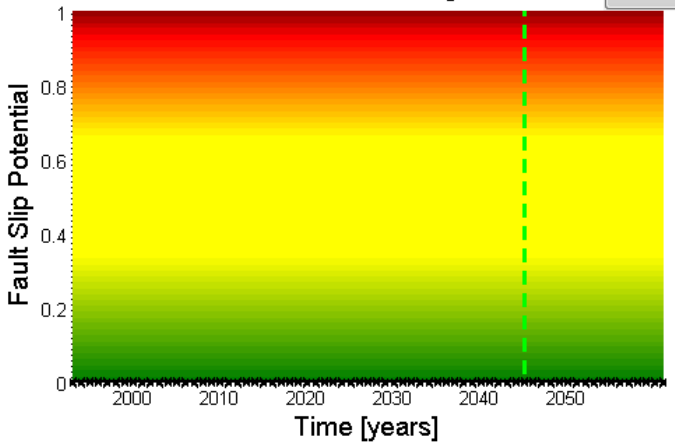

Subject well: Ghost Rider SWD #1




Year: 2045




Export




FSP Exh. 11

## Table 1
## FSP ANALYSIS WITH SUBJECT WELL

| Fault Segment | Fault Source | ΔP to slip | ΔP at 2045 |
|---|---|---|---|
| **F1** | BEG (Basement) | 8,676 | 273 |
| **F2** | BEG (Basement) | 8,660 | 393 |
| **F3** | BEG (Basement) | 8,651 | 444 |
| **F4** | BEG (Basement) | 8,459 | 454 |
| **F5** | BEG (Basement) | 8,329 | 417 |
| **F6** | BEG (Basement) | 7,915 | 325 |
| **F7** | BEG (Basement) | 7,773 | 224 |
| **F8** | BEG (Basement) | 8,252 | 150 |
| **F9** | BEG (Basement) | 8,503 | 105 |
| **F10** | BEG (Basement) | 6,529 | 458 |
| **F11** | BEG (Basement) | 6,568 | 450 |
| **F12** | BEG (Basement) | 6,875 | 198 |
| **F13** | BEG (Basement) | 7,355 | 270 |
| **F14** | BEG (Basement) | 7,355 | 328 |
| **F15** | BEG (Basement) | 5,788 | 410 |
| **F16** | BEG (Basement) | 4,428 | 317 |
| **F17** | BEG (Basement) | 8,725 | 151 |
| **F18** | BEG (Basement) | 8,758 | 216 |
| **F19** | BEG (Basement) | 8,758 | 276 |
| **F20** | BEG (Basement) | 8,742 | 197 |
| **F21** | BHP at well | NA | 1,065 |

FSP Exh. 12

# Exhibit 5

## Notice Affidavit and Exhibits

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

**APPLICATION OF NGL WATER SOLUTIONS PERMIAN, LLC FOR APPROVAL OF SALT WATER DISPOSAL WELL IN LEA COUNTY, NEW MEXICO**

**Case No. 20575**

**AFFIDAVIT**

STATE OF NEW MEXICO )
) ss.
COUNTY OF SANTA FE )

Lara Katz, attorney in fact and authorized representative of NGL Water Solutions Permian LLC, the Applicant herein, being first duly sworn, upon oath, states that the above-referenced Application was provided under a notice letter and that proof of receipt is attached hereto.

Lara Katz

SUBSCRIBED AND SWORN to before me this 12 day of June, 2019 by Lara Katz.

Notary Public

My commission expires: 07/07/2019

OFFICIAL SEAL
Suleika Enriquez
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires: 07/07/19

**Mail Activity Report - CertifiedPro.net**
**Mailed from 5/1/2019 to 6/6/2019**
**User Name: abadieschill**
**Generated: 6/6/2019 9:22:47 AM**

| USPS Article Number | Return Receipt Article Number | Reference Number | Date Mailed | Name 1 | Name 2 | Address 1 | Address 2 | Address 3 | City | State | Zip | FMB ID | User Name | User ID | Mailing Status | Service Options |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9314869904300059492850 | Not Applicable | Ghost Rider | 05/24/2019 | BELLOMY EXPLORATION, LLC | | 1700 PACIFIC AVE STE 2220 | | | DALLAS | TX | 75201-4649 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059494298 | Not Applicable | Ghost Rider | 05/24/2019 | BERNARD LEE HOUSE FAMILY TRUST | | 49 BURLESON LN | | | TULAROSA | NM | 88352-9402 | | abadieschill | 21902 | To be Returned | Return Receipt - Electronic, Certified Mail |
| 9314869904300059494465 | Not Applicable | Ghost Rider | 05/24/2019 | BLACK MOUNTAIN OPERATING, LLC | | 500 MAIN ST STE 1200 | | | FORT WORTH | TX | 76102-3926 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059494519 | Not Applicable | Ghost Rider | 05/24/2019 | BOAZ ENERGY II, LLC | | 201 W WALL ST STE 421 | | | MIDLAND | TX | 79701-4595 | | abadieschill | 21902 | To be Returned | Return Receipt - Electronic, Certified Mail |
| 9314869904300059494823 | Not Applicable | Ghost Rider | 05/24/2019 | CMP Acquisitions, LLC | | 901 Lamberton PL NE | | | Albuquerque | NM | 87107 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059494861 | Not Applicable | Ghost Rider | 05/24/2019 | COLGATE PRODUCTION, LLC | | 306 W WALL ST STE 500 | | | MIDLAND | TX | 79701-5173 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059494946 | Not Applicable | Ghost Rider | 05/24/2019 | Crown Rock Minerals, LP | | 611 W Brown St | | | Wylie | TX | 75098 | | abadieschill | 21902 | To be Returned | Return Receipt - Electronic, Certified Mail |
| 9314869904300059495417 | Not Applicable | Ghost Rider | 05/24/2019 | DEVON ENERGY PRODUCTION CO., LP | | 333 W SHERIDAN AVE | | | OKLAHOMA CITY | OK | 73102-5010 | | abadieschill | 21902 | Mailed | Return Receipt - Electronic, Certified Mail |
| 9314869904300059495493 | Not Applicable | Ghost Rider | 05/24/2019 | DIANA NORTHINGTON | | 1630 COUNTY ROAD 87 | | | DEATSVILLE | AL | 36022-2503 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059495530 | Not Applicable | Ghost Rider | 05/24/2019 | EASTERLING NEW MEXICO MINERALS, LLC | | 10 WIND RD NW | | | ALBUQUERQUE | NM | 87120-1914 | | abadieschill | 21902 | Mailed | Return Receipt - Electronic, Certified Mail |
| 9314869904300059495561 | Not Applicable | Ghost Rider | 05/24/2019 | EOG RESOURCES INC | | PO BOX 2267 | | | MIDLAND | TX | 79702-2267 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059495592 | Not Applicable | Ghost Rider | 05/24/2019 | EOG RESOURCES, INC. | | 5509 CHAMPIONS DR | | | MIDLAND | TX | 79706-2843 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059495639 | Not Applicable | Ghost Rider | 05/24/2019 | EOG Y, A, M RESOURCES INC | | 105 S 4TH ST | | | ARTESIA | NM | 88210-2177 | | abadieschill | 21902 | To be Returned | Return Receipt - Electronic, Certified Mail |
| 9314869904300059495684 | Not Applicable | Ghost Rider | 05/24/2019 | FHW, JR.- DRILLING, LTD | | 500 W 7TH ST STE 1007 | | | FORT WORTH | TX | 76102-4732 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059495745 | Not Applicable | Ghost Rider | 05/24/2019 | FORTIS MINERALS, LLC | | PO BOX 876 | | | STOWE | VT | 05672-0876 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059495813 | Not Applicable | Ghost Rider | 05/24/2019 | FRANKLIN MOUNTAIN ENERGY LLC | | 123 W MILLS AVE STE 600 | | | EL PASO | TX | 79901-1577 | | abadieschill | 21902 | Mailed | Return Receipt - Electronic, Certified Mail |
| 9314869904300059495882 | Not Applicable | Ghost Rider | 05/24/2019 | GGM EXPLORATION, INC. | | PO BOX 123610 | | | FORT WORTH | TX | 76121-3610 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059496193 | Not Applicable | Ghost Rider | 05/24/2019 | Great Western Drilling Ltd. | | 700 W Louisiana Ave. | | | Midland | TX | 79701 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059496391 | Not Applicable | Ghost Rider | 05/24/2019 | ISRAMCO ENERGY, LLC | | 1001 WEST LOOP S STE 750 | | | HOUSTON | TX | 77027-9046 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059496506 | Not Applicable | Ghost Rider | 05/24/2019 | JOHN W. B. NORTHINGTON | | 12613 AVELAR CREEK DR | | | RIVERVIEW | FL | 33578-7624 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059496513 | Not Applicable | Ghost Rider | 05/24/2019 | JUMBO AMERICAN PETROLEUM CORP. | | 550 W TEXAS AVE STE 1303 | | | MIDLAND | TX | 79701-4257 | | abadieschill | 21902 | To be Returned | Return Receipt - Electronic, Certified Mail |
| 9314869904300059496537 | Not Applicable | Ghost Rider | 05/24/2019 | KATHERINE MADEA JARRETT | | 12667 S FM 730 | | | AZLE | TX | 76020-2724 | | abadieschill | 21902 | Mailed | Return Receipt - Electronic, Certified Mail |
| 9314869904300059496551 | Not Applicable | Ghost Rider | 05/24/2019 | KATHERINE ROSS MADERA | | PO BOX 443 | | | MANHATTAN | MT | 59741-0443 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059496674 | Not Applicable | Ghost Rider | 05/24/2019 | LEA CLAIRE MCDONALD BROOKER | | 4001 N BENSING RD | | | HOBBS | NM | 88240-8827 | | abadieschill | 21902 | To be Returned | Return Receipt - Electronic, Certified Mail |
| 9314869904300059496773 | Not Applicable | Ghost Rider | 05/24/2019 | LELA ELLEN MADERA | | 187 GEORGE STRAIT | | | CANYON LAKE | TX | 78133-2153 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059496889 | Not Applicable | Ghost Rider | 05/24/2019 | M R C PERMIAN, LLC | | 5400 LYNDON B JOHNSON FWY STE 1500 | | | DALLAS | TX | 75240-1017 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059496933 | Not Applicable | Ghost Rider | 05/24/2019 | MAGNUM HUNTER PRODUCTION, INC. | | 600 N MARIENFELD ST STE 600 | | | MIDLAND | TX | 79701-4405 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059497206 | Not Applicable | Ghost Rider | 05/24/2019 | Malcolm Raymond Sharbutt | | 7041 5th #3 | | | Woodside | NY | 11377 | | abadieschill | 21902 | Mailed | Return Receipt - Electronic, Certified Mail |
| 9314869904300059497244 | Not Applicable | Ghost Rider | 05/24/2019 | Marathon Oil Permian, LLC | | 5555 San Felipe St | | | Houston | TX | 77056 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059497282 | Not Applicable | Ghost Rider | 05/24/2019 | MONTY BRAD BECKHAM | | PO BOX 823 | | | JAL | NM | 88252-0823 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059497381 | Not Applicable | Ghost Rider | 05/24/2019 | NGL WATER SOLUTIONS PERMIAN, LLC | | 1509 W WALL ST STE 306 | | | MIDLAND | TX | 79701-6580 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059497541 | Not Applicable | Ghost Rider | 05/24/2019 | Oil Conservation Division District I - Hobbs | | 1625 N. French Drive | | | Hobbs | NM | 88240 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059497626 | Not Applicable | Ghost Rider | 05/24/2019 | Oil Conservation Division District IV | | 1220 South St. Francis Drive | | | Santa Fe | NM | 87505 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059497657 | Not Applicable | Ghost Rider | 05/24/2019 | OXY USA INC. | | PO BOX 27570 | | | HOUSTON | TX | 77227-7570 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059497701 | Not Applicable | Ghost Rider | 05/24/2019 | PEGASUS RESOURCES, LLC | | PO BOX 470698 | | | FORT WORTH | TX | 76147-0698 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059497749 | Not Applicable | Ghost Rider | 05/24/2019 | Pevehouse, Inc. | | 3300 N. "A" Street | Bldg. 1-201 | | Midland | TX | 79705 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059499958 | Not Applicable | Ghost Rider | 05/24/2019 | POGO RESOURCES, LLC | | 3879 MAPLE AVE STE 400 | | | DALLAS | TX | 75219-3965 | | abadieschill | 21902 | Mailed | Return Receipt - Electronic, Certified Mail |
| 9314869904300059499972 | Not Applicable | Ghost Rider | 05/24/2019 | Providence Energy Partners III, LLC | | 16400 Dallas Parkway | | | Dallas | TX | 75248 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059500005 | Not Applicable | Ghost Rider | 05/24/2019 | ROBERT C. NORTHINGTON | | 1655 CHAMBERS BROOKS SPRING RD | | | SANDERSVILLE | GA | 31082-9346 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059500050 | Not Applicable | Ghost Rider | 05/24/2019 | SALT CREEK MIDSTREAM, LLC | | 122C CRAZY RABBIT RD | | | SANTA FE | NM | 87508-7022 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059500098 | Not Applicable | Ghost Rider | 05/24/2019 | SANTA ELENA MINERALS IV, LP | | PO BOX 2063 | | | MIDLAND | TX | 79702-2063 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059500173 | Not Applicable | Ghost Rider | 05/24/2019 | SHARBRO OIL LTD CO | | PO BOX 840 | | | ARTESIA | NM | 88211-0840 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059500210 | Not Applicable | Ghost Rider | 05/24/2019 | TALON OIL & GAS III, LLC | | 3131 MCKINNEY AVE STE 750 | | | DALLAS | TX | 75204-2457 | | abadieschill | 21902 | Mailed | Return Receipt - Electronic, Certified Mail |
| 9314869904300059500272 | Not Applicable | Ghost Rider | 05/24/2019 | TAP ROCK RESOURCES, LLC | | 602 PARK POINT DR STE 200 | | | GOLDEN | CO | 80401-9359 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059500333 | Not Applicable | Ghost Rider | 05/24/2019 | Tommie Knight Calley | | P. O. Box 2244 | | | Quemado | NM | 87829 | | abadieschill | 21902 | To be Returned | Return Receipt - Electronic, Certified Mail |
| 9314869904300059500364 | Not Applicable | Ghost Rider | 05/24/2019 | TRANSGLOBE OIL & GAS CORPORATION | | 475 17TH ST STE 1350 | | | DENVER | CO | 80202-4032 | | abadieschill | 21902 | To be Returned | Return Receipt - Electronic, Certified Mail |
| 9314869904300059500609 | Not Applicable | Ghost Rider | 05/24/2019 | TUNDRA HOLDINGS, LLC | | PO BOX 192428 | SUITE 1500 | | DALLAS | TX | 75219-8519 | | abadieschill | 21902 | To be Returned | Return Receipt - Electronic, Certified Mail |
| 9314869904300059500630 | Not Applicable | Ghost Rider | 05/24/2019 | WILDERPAN, LLC | | PO BOX 50088 | | | MIDLAND | TX | 79710-0088 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059500722 | Not Applicable | Ghost Rider | 05/24/2019 | WILL ROSS SHARBUTT | | 4029 HARMON LN | | | CARLSBAD | NM | 88220-2832 | | abadieschill | 21902 | Mailed | Return Receipt - Electronic, Certified Mail |
| 9314869904300059500777 | Not Applicable | Ghost Rider | 05/24/2019 | WILLIAM BRIAN BECKHAM | | 11205 LIMONCILLO CT | | | AUSTIN | TX | 78750-3688 | | abadieschill | 21902 | Forwarded | Return Receipt - Electronic, Certified Mail |
| 9314869904300059494748 | Not Applicable | Ghost Rider | 05/25/2019 | C. D. MARTIN | | 47 RODEO DR | | | LA LUZ | NM | 88337-9370 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059497350 | Not Applicable | Ghost Rider | 05/25/2019 | NEW MEXICO STATE LAND OFFICE | | PO BOX 1148 | | | SANTA FE | NM | 87504-1148 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |
| 9314869904300059494564 | Not Applicable | Ghost Rider | 05/26/2019 | BRIGHAM MINERALS, LLC | | 5914 W COURTYARD DR STE 100 | | | AUSTIN | TX | 78730-4911 | | abadieschill | 21902 | Delivered | Return Receipt - Electronic, Certified Mail |

# 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
May 25, 2019
and ending with the issue dated
May 25, 2019.

Daniel Russell
Publisher

Sworn and subscribed to before me this 25th day of May 2019.

Gussie Black
Business Manager

My commission expires
January 29, 2023
(Seal)

OFFICIAL SEAL
GUSSIE BLACK
Notary Public
State of New Mexico
My Commission Expires 1-29-23

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

**LEGAL NOTICE**
**MAY 25, 2019**

**Case No. 20575: Notice to all affected parties, as well as the heirs and devisees of NEW MEXICO STATE LAND OFFICE; BUREAU OF LAND MGMT; BELLOMY EXPLORATION LLC; BERNARD LEE HOUSE FAMILY TRUST; BLACK MOUNTAIN OPERATING LLC; BMOG LLC; BOAZ ENERGY II LLC; BRIGHAM MINERALS LLC; C. D. MARTIN; CMP ACQUISITIONS LLC; COLGATE PRODUCTION LLC; CROWN ROCK MINERALS LP; DEVON ENERGY PRODUCTION CO LP; DIANA NORTHINGTON; EASTERLING NEW MEXICO MINERALS LLC; EOG RESOURCES INC; EOG A RESOURCES INC; EOG M RESOURCES INC; EOG Y RESOURCES INC; FHW, JR.- DRILLING LTD; FORTIS MINERALS LLC; FRANKLIN MOUNTAIN ENERGY LLC; GGM EXPLORATION INC; GREAT WESTERN DRILLING LTD; ISRAMCO ENERGY LLC; JOHN W. B. NORTHINGTON; JUMBO AMERICAN PETROLEUM CORP; KATHERINE MADEA JARRETT; KATHERINE ROSS MADERA; LEA CLAIRE MCDONALD BROOKER; LELA ELLEN MADERA; M R C PERMIAN LLC; MAGNUM HUNTER PRODUCTION INC; MALCOLM RAYMOND SHARBUTT; MARATHON OIL PERMIAN LLC; MONTY BRAD BECKHAM; NGL WATER SOLUTIONS PERMIAN LLC; OXY USA INC; PEGASUS RESOURCES LLC; PEVEHOUSE INC; POGO RESOURCES LLC; PROVIDENCE ENERGY PARTNERS III LLC; ROBERT C. NORTHINGTON; SALT CREEK MIDSTREAM LLC; SANTA ELENA MINERALS IV LP; SHARBRO OIL LTD CO; TALON OIL & GAS III LLC; TAP ROCK RESOURCES LLC; TOMMIE KNIGHT CALLEY; TRANSGLOBE OIL & GAS CORPORATION; TUNDRA HOLDINGS LLC; WILDERPAN LLC; WILL ROSS SHARBUTT; WILLIAM BRIAN BECKHAM: NGL Water Solutions Permian, LLC, 1509 Wall Street, Suite 306, Midland, Texas 79701 has filed an application for hearing along with a C-108 (Application for Authorization to Inject) with the New Mexico Oil Conservation Division for approval of a 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 June 13, 2019, to consider this application. Applicant seeks an order approving disposal into the Silurian- Devonian formation through the **Ghost Rider SWD #1** well at a surface location 1,585 feet from the South line and 270 feet from the East line of Section 30, Township 26 South, Range 35 East, NMPM, Lea County, New Mexico for the purpose of operating a salt water disposal well. NGL seeks authority to inject salt water into the Silurian- Devonian formation at a depth of 18,953' to 20,729'. NGL further seeks approval of the use of 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 injection rate for the well of 50,000 bbls per day. Said location is 11.7 miles Southwest of Bennett, New Mexico.
**#34189**

67115820 00228708

KAIYA TOOP
ABADIE SCHILL
214 McKENZIE
SANTA FA
NM, NM 87501