

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

**APPLICATION OF NORTHWIND  
MIDSTREAM PARTNERS LLC FOR  
APPROVAL OF A REDUNDANT ACID GAS  
INJECTION WELL AS REQUIRED UNDER  
ORDER NO. R-20913, AS AMENDED, LEA  
COUNTY, NEW MEXICO.**

**CASE NO. \_\_\_\_\_  
ORDER NO. 20913-D, AS AMENDED**

**APPLICATION**

Northwind Midstream Partners LLC (“Northwind”) (OGRID No. 331501), through its undersigned counsel hereby files this application with the Oil Conservation Commission (the “Commission”) pursuant to the provisions of NMSA 1978, § 70-2-12(B)(15) and 19.15.26 NMAC for an order authorizing injection of treated acid gas (“TAG”) for purposes of disposal into a redundant acid gas injection (“AGI”) well as required under Order No. R-21093-D, as amended. In support, Northwind states the following:

1. Order No. R-20913-D required Salt Creek Midstream, LLC (“Salt Creek”) to file a Form C-108 application with the Division for approval to construct and operate a redundant AGI well in the Devonian-Silurian formations and to complete the well no later than fifteen months after the Commission issues an order approving the redundant Devonian well. *See* Order No. R-20913-D. The Commission subsequently entered Order No. R-20913-F on June 8, 2023, affirming this requirement under Order No. R-20913-D.

2. Salt Creek timely submitted a C-108 to the Division for approval of a redundant AGI well on October 14, 2022, under Action ID #150950. The proposed well is the **Salt Creek AGI #2** well. On September 12, 2023 Northwind Midstream Partners LLC spud the Salt Creek AGI #3 well (30-025-51865).

3. Effective August 18, 2023, the Division approved Northwind to be the successor operator to Salt Creek under Order No. R-20913, as amended.

4. Attached is the complete Form C-108 application for authorization to inject filed with the Division which contains all the information necessary to authorize the requested approval to inject that was previously filed with the Division. *See* C-108, attached as **Exhibit A**, and incorporated herein.

5. The Salt Creek AGI #2 (API No. pending) was initially proposed to be drilled as a vertical well with a surface location approximately 2,665 feet from the south line and 245 feet from the west line (Unit L) of Section 21, Township 26 South, Range 36 East, NMPM, Lea County, New Mexico.

6. However, while planning the design and construction of the surface facilities for the related gas treating equipment, Northwind identified a preferred location for purposes of coordinating surface facilities. Northwind therefore proposes a minor revision to the Salt Creek AGI #2 location to a position approximately 125 feet to the northeast or approximately 2,513 feet from the north line and 310 feet from the west line (Unit E) of said Section 21.

7. The proposed injection disposal interval will be within the Silurian-Devonian formations at depths of approximately 17,550 feet to 18,650 feet below the ground through an open-hole completion.

8. The injection stream will consist of TAG comprised of approximately 80 percent carbon dioxide and 20 percent hydrogen sulfide from oil and gas wells in the area.

9. The proposed Salt Creek AGI #2 is designed to address the disposal needs of the Northwind Midstream Gas Processing Facility to safely inject up to a maximum of 12 million standard cubic feet (MMSCF) per day (approximately 6,631 barrels per day) of TAG for at least 30 years.

10. The proposed maximum allowable operating pressure (“MAOP”) requested for the Salt Creek AGI #2 is approximately 5,798 psig. At the anticipated reservoir conditions of 236 °F and 7,837 psig, each MMSCF of TAG will occupy a reservoir volume of approximately 402 barrels.

11. Approving this application will avoid the drilling of unnecessary wells, prevent waste, and protect correlative rights.

WHEREFORE, Northwind Midstream Partners LLC requests that this application be set for hearing before the Oil Conservation Commission on November 9, 2023, and, after notice and hearing as required by law, the Commission enter an order approving this application.

Respectfully submitted,

HOLLAND & HART LLP

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**ATTORNEYS FOR NORTHWIND MIDSTREAM  
PARTNERS LLC**

CASE \_\_\_\_\_:

**Application of Northwind Midstream Partners LLC for Approval of Redundant Acid Gas Injection Well As Required Under Order No. R-20913, As Amended, Lea County, New Mexico.** Applicant in the above-styled cause seeks an order authorizing injection of treated acid gas (“TAG”) for purposes of disposal into a redundant acid gas injection (“AGI”) well to be named the **Salt Creek AGI #2 Well** (API No. pending) as required under Order No. R-21093-D, as amended. The proposed well will be located approximately 2,513 feet from the north line and 310 feet from the west line (Unit E) of said Section 21, Township 26 South, Range 36 East, NMPM, Lea County, New Mexico. Injection will be into the Silurian-Devonian formations at depths of approximately 17,550 feet to 18,650 feet below the ground through an open-hole completion. The injection stream will consist of TAG comprised of approximately 80 percent carbon dioxide and 20 percent hydrogen sulfide from oil and gas wells in the area. The proposed maximum rate of injection is 12 million standard cubic feet (MMSCF) per day (approximately 6,631 barrels per day) of TAG. The proposed maximum allowable operating pressure will be 5,798 psig. The subject well will be located approximately 7.5 miles southwest of Jal, N.M.

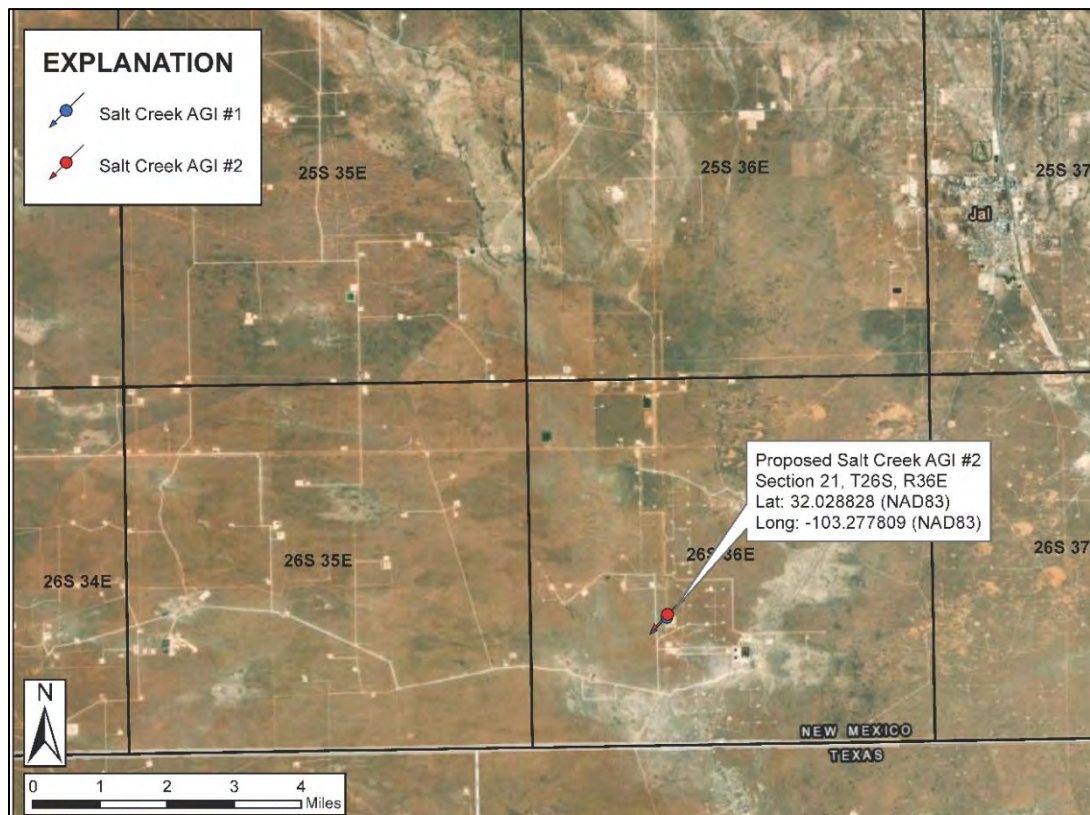
# EXHIBIT A



## APPLICATION FOR A REDUNDANT CLASS II AGI WELL NORTHWIND MIDSTREAM PARTNERS, LLC (AS REQUIRED BY NMOCC ORDER R-20913)

**SALT CREEK AGI WELL #2**  
Section 21, Township 26 South, Range 36 East  
Lea County, New Mexico

Surface Hole Latitude (NAD83): 32.028828  
Surface Hole Longitude (NAD83): -103.277809



Originally submitted: November 14, 2022

**Prepared For:**  
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**PREFACE TO SALT CREEK AGI #2 C-108 APPLICATION**  
REGARDING RECENT CHANGE OF OPERATOR & ADDITIONAL PROJECT DEVELOPMENTS  
(Subsequent to Original Application Submittal on October 14, 2022)

On behalf of Northwind Midstream Partners, LLC (Northwind), the enclosed Form C-108 application is being re-submitted to the New Mexico Oil Conservation Division (NMOCD) and New Mexico Oil Conservation Commission (NMOCC). The application was originally filed and submitted for NMOCD review on October 14, 2022 (Action ID #150950) by the former gas-processing plant owner and AGI well operator, Salt Creek Midstream, LLC, in accordance with NMOCC Order R-20913 (C,D) Special Conditions of Approval.

Salt Creek's timely development and submittal of the Salt Creek AGI #2 C-108 application partially fulfilled the requirements of NMOCC Order R-20913 (C,D) relating to the timeline in which permitting, construction, and commissioning of a second AGI well at the facility must occur. Subsequent to Salt Creek's filing of this application, the gas-processing plant and operatorship of the approved AGI well (DMG well) were transferred to Northwind Midstream Partners, LLC (OGRID #331501).

As a redundant, two-well AGI system will aid in ensuring operational and environmental stability at the gas-processing facility, Northwind is eager to move forward with development and construction of the redundant AGI well and seeks NMOCC consideration and approval of the Salt Creek AGI #2 application. As the application was previously submitted in a timely manner by Salt Creek Midstream, revisions of the application have been completed only to reflect Northwind Midstream, LLC as the applicant and well operator. All other supporting materials remain unchanged from the original application.

To aid in consideration of the application of Northwind for the proposed Salt Creek AGI #2, we provide in this preface a summary of critical project developments that have occurred since submittal of the original Salt Creek AGI #2 application, as well as relevant supplemental figures. Key project developments following original application submission include the following:

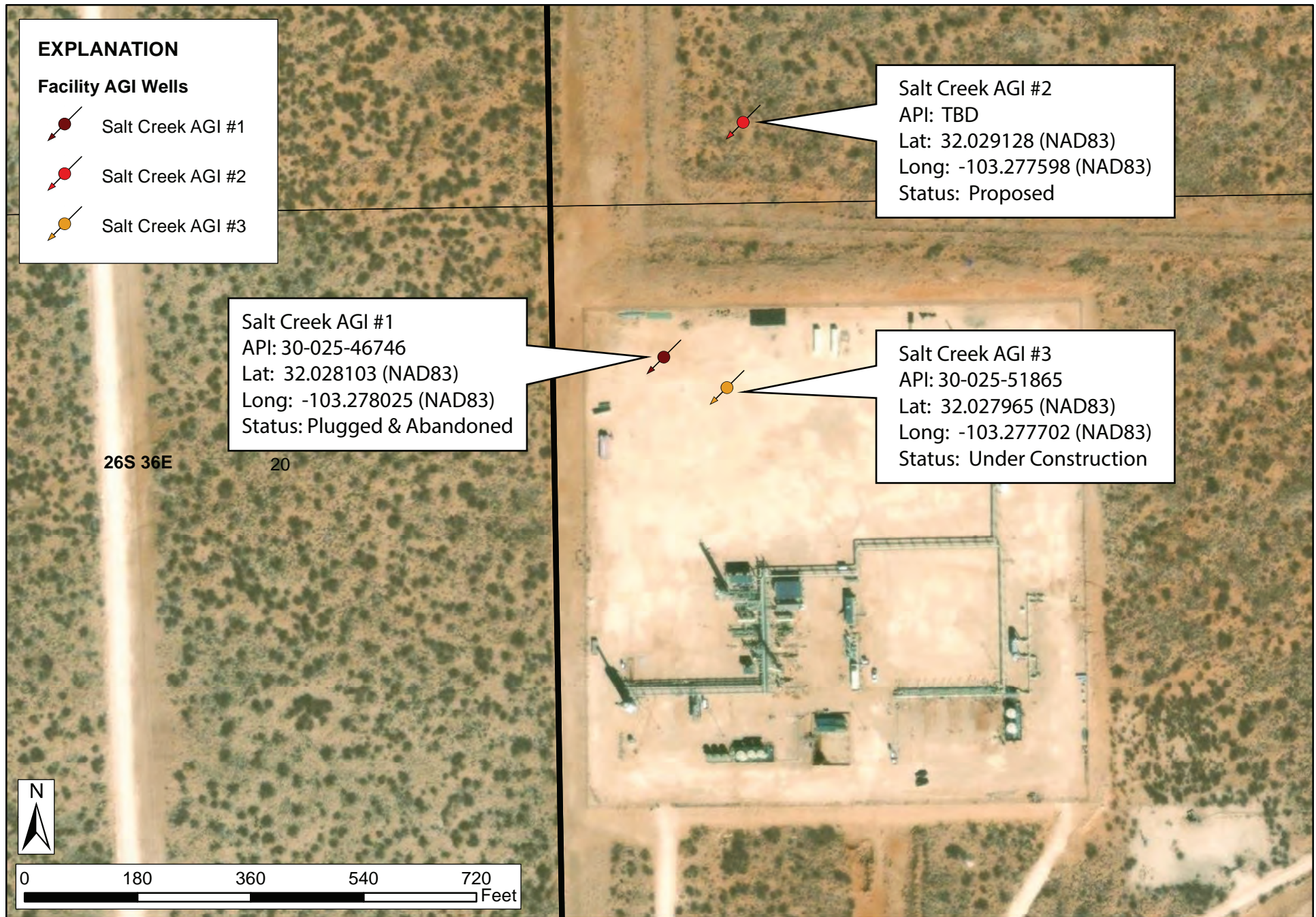
1. Operations to drill the Salt Creek AGI Well #1 (API: 30-025-46746), originally authorized by NMOCC Order R-20913, commenced, but were unsuccessful as down-hole hazards resulted in casing becoming parted and lost within the borehole. Following collaboration with NMOCD personnel to develop an appropriate plan, the well was successfully plugged and abandoned.
2. Following the abandonment of the original AGI well location (Salt Creek AGI #1), Salt Creek filed an additional Form C-108 application, seeking NMOCC authorization to redesign and relocate Salt Creek AGI #1. Considerations of the redesign plan included additional casing strings to isolate down-hole hazards encountered. The application was presented and approved by the NMOCC, in a public hearing, on May 11, 2023. To preserve well records and the plugged-well status of Salt Creek AGI #1, approval of the application required generation of a new well file with the well designation Salt Creek AGI #3 (API: 30-025-51865).
3. In planning the design and construction of gas-processing facility surface equipment, Northwind has identified that minor revision of the proposed Salt Creek AGI #2 well surface location is preferred to ensure safe and accessible equipment layout. Minor modification of the AGI #2 surface location, to a position approximately 125 to the northeast, places the well at 32.029128, -103.277598 (NAD83) and does not significantly alter the application area of review (AOR). In accordance with NMOCC hearing procedures, all relevant interested parties will be provided with notice of the application hearing along with complete copies of the application.



4. As the current and anticipated surface locations of Northwind's AGI well projects (including approved, plugged, and proposed) differ from those described in the original Salt Creek AGI #2 application, submitted on October 14, 2022, we also provide a Supplemental Figure 1, on the following page, which shows the specific location of the plugged Salt Creek AGI #1, the relocated and redesigned Salt Creek AGI #3, and the proposed Salt Creek AGI #2.
5. As shown in Supplemental Figure 1, the surface location coordinates for relevant AGI wells are as follows:

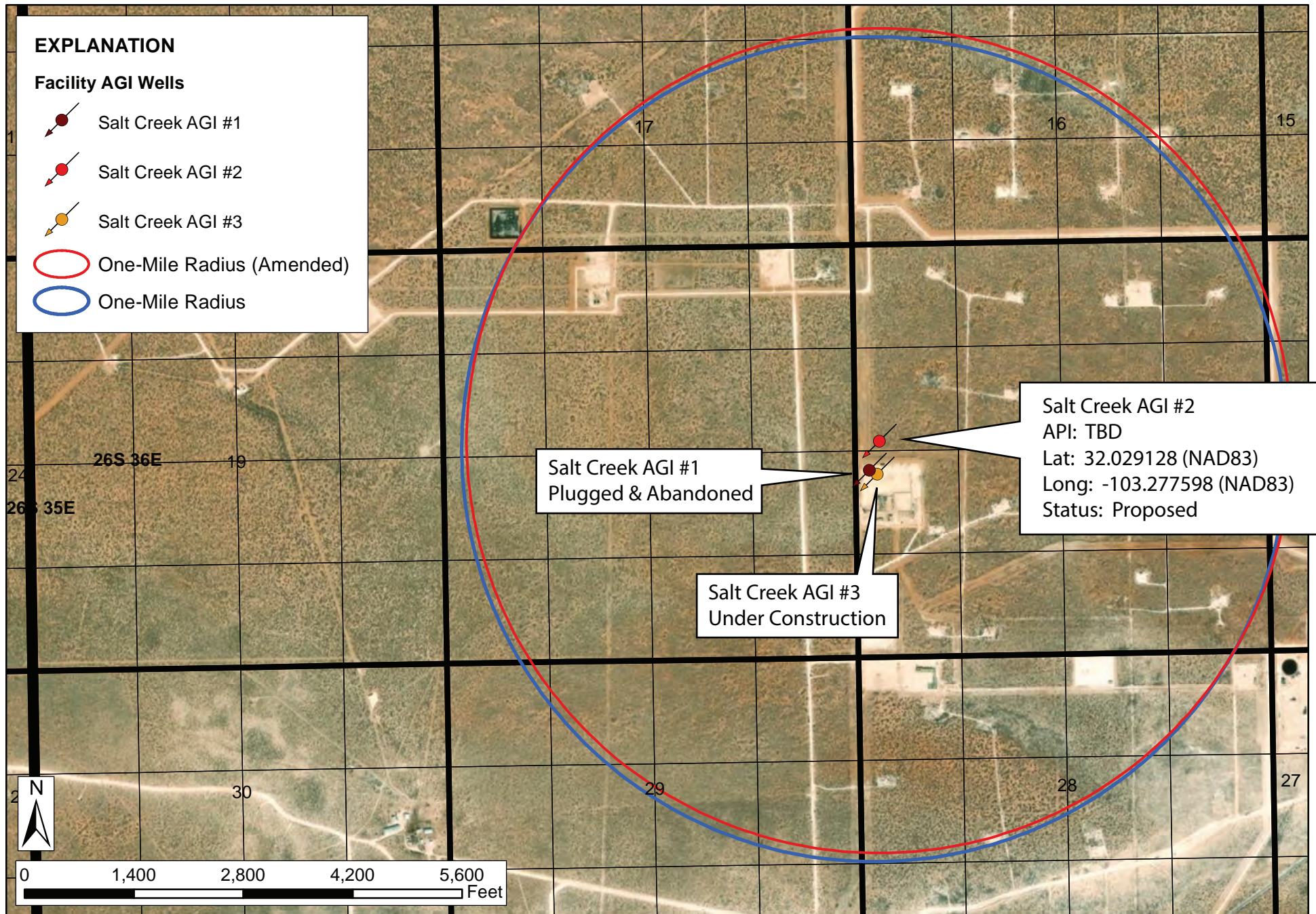
Salt Creek AGI #1 (plugged & abandoned)	32.028103, -103.278025 (NAD83)
Salt Creek AGI #2 (proposed)	32.029128, -103.277598 (NAD83)
Salt Creek AGI #3 (new/approved)	32.027965, -103.277702 (NAD83)

As the original application for the proposed Salt Creek AGI #2 was filed timely, and the implementation a redundant, deep AGI well at this facility is in the interest of the applicant (Northwind), the Commission, the Division, and others, Northwind seeks to further progress the previously submitted Salt Creek AGI #2 C-108 application and respectfully requests the application be scheduled for hearing for consideration by the NMOCC.



Supplemental Figure 1 -- General location map showing Northwind Gas Processing Facility and the location of all approved, proposed, and plugged and abandoned Salt Creek AGI wells.





Supplemental Figure 2 -- General location map showing one-mile radius area around original and revised AGI #2 location.

STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL  
RESOURCES DEPARTMENT

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

FORM C-108  
Revised June 10, 2003

**APPLICATION FOR AUTHORIZATION TO INJECT**

I. PURPOSE: \_\_\_\_\_ Secondary Recovery \_\_\_\_\_ Pressure Maintenance  Disposal \_\_\_\_\_ Storage  
Application qualifies for administrative approval? \_\_\_\_\_ Yes  No

II. OPERATOR: NORTHWIND MIDSTREAM PARTNERS, LLC

ADDRESS: 825 Town and Country Ln; Bldg. 5, Suite 700; Houston, TX 77024

CONTACT PARTY: Ben Ahiabor PHONE: (281)382-7785

III. WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injection.  
Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project?  Yes \_\_\_\_\_ No  
If yes, give the Division order number authorizing the project: NMOCC ORDER R-20913 -- Redundant AGI Well Requirement

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. **SECTIONS 5 & 6; APPENDICES A & B**

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. **SECTION 5; APPENDIX A**

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected; **SECTIONS 1, 2, & 3**
2. Whether the system is open or closed; **SECTIONS 1, 2, 4, & 7**
3. Proposed average and maximum injection pressure; **SECTIONS 1 & 3**
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and, **SECTIONS 3 & 4**
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.). **SECTIONS 3 & 4**

\*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. **SECTIONS 3 & 4**

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).  
**WELL NOT YET DRILLED**

\*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. **SECTION 4.5**

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. **SECTION 7**

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: DAVID A. WHITE, P.G. TITLE: CONSULTANT TO NORTHWIND

SIGNATURE:  DATE: OCTOBER 10, 2023

E-MAIL ADDRESS: DWHITE@GEOLEX.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.

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Attachment B: Sample public notice of hearing

## 1.0 EXECUTIVE SUMMARY

On behalf of Northwind Midstream, LLC (Northwind), Geolex<sup>®</sup>, Inc. (Geolex) has prepared and is hereby submitting a complete C-108 application for approval to drill, complete, and operate an acid gas (CO<sub>2</sub> and H<sub>2</sub>S) injection (AGI) well in Section 21, Township 26 South, Range 36 East, approximately 7.5 miles southwest of Jal in Lea County, New Mexico (Figure 1). The proposed well, Salt Creek AGI #2, will ensure operational stability and redundancy with respect to acid gas disposal operations at Northwind's Natural Gas Processing Facility and will fulfill the redundant Devonian AGI well requirement of NMOCC Order R-20913 (A-D).

The proposed Salt Creek AGI #2 is designed to address the disposal needs of the Northwind Midstream Gas Processing Facility, which needs to safely inject up to a maximum of twelve (12) million standard cubic feet (MMSCF) per day (approximately 6,631 barrels per day) of treated acid gas (TAG) for at least 30 years. The TAG stream is anticipated to consist of approximately 80% carbon dioxide (CO<sub>2</sub>) and 20% hydrogen sulfide (H<sub>2</sub>S) with trace components of hydrocarbons (C<sub>1</sub> – C<sub>7</sub>). When operating at full capacity, Salt Creek AGI #2 will permanently sequester daily approximately 590 tons of CO<sub>2</sub> and approximately 115 tons of H<sub>2</sub>S.

Salt Creek AGI #2 will be drilled as a vertical well with a surface location of approximately 2,665 feet from the south line (FSL) and approximately 245 feet from the west line (FWL) of Section 21, approximately 255 feet northeast of the permitted Salt Creek AGI #1 (Figure 2). The well will be constructed utilizing a five-string casing design and all casing strings will be cemented to the surface. The integrity of cementing operations will be verified via visual inspection, as well as collection of cement bond logs for all casing strings. The production casing and injection tubing will utilize 300 feet of corrosion resistant alloy materials in order to protect the well and lower well components from corrosive conditions.

The proposed injection zone will target the Silurian-Devonian formations at depths of approximately 17,550 feet to 18,650 feet. Analyses of these geologic units confirm that they act as excellent closed-system reservoirs that will accommodate the future needs of Northwind for the disposal of acid gas and sequestration of CO<sub>2</sub> from the Northwind Midstream Gas Processing Facility and provide redundancy required by NMOCC Order R-20913.

In the area of Salt Creek AGI #2, the proposed injection interval is overlain by the Woodford Shale (over 400 feet thick) and an additional 3,850 feet of tight carbonates in the Atoka, Morrow, Barnett, and Osage formations. These units, in total, will provide more than 4,200 feet of caprock that will sufficiently contain and prevent the upward migration of TAG. Within the area of interest, the closest active pay zone is approximately 5,200 feet above the proposed injection zone in the Lower Wolfcamp. The distance from active producing zones as well as the thick caprock ensures production will be unaffected by TAG injection in the Salt Creek AGI #2. Additionally, the low porosity intervals of the underlying Montoya and Ellenburger carbonates will prevent downward migration into underlying geologic strata.

The proposed maximum allowable operating pressure (MAOP) requested for the Northwind Midstream AGI #2 is approximately 5,798 psig, which was determined by utilizing appropriate NMOCD-approved calculation methods that utilize the specific gravity of the injection stream. At the anticipated reservoir conditions of 236 °F and 7,837 psig, each MMSCF of TAG will occupy a reservoir volume of approximately 402 barrels.

After 30 years of injection at the proposed rate of twelve (12) MMSCF per day, the resultant TAG plume would occupy an area of approximately 138 acres (0.26-mile radius). Based on the results simulating the



area of the TAG plume after 30 years of injection, it will not impact the nearest wells penetrating the injection zone nor any subsurface structures.

Within the one-mile area of review, there are 63 wells, which most commonly were completed to produce shallow Tansill-Yates-Seven River plays and deeper Bone Spring and Wolfcamp Formation plays. Specific well data are summarized in Appendix A along with relevant plugging documents. Of these wells, 22 are active and 20 are plugged. Additionally, there are 15 locations permitted that have not yet been drilled or completed. Within a two-mile radius, the proposed injection zone is penetrated by four plugged wells. All relevant plugging reports and documents for these wells are included in Appendix A and demonstrate that they have been properly cemented through the injection zone and will not be negatively impacted by the operation of the proposed Salt Creek AGI #2 well nor serve as conduits out of the injection interval.

The area surrounding the proposed injection site is arid and there are no natural bodies of water within several miles of the Northwind Facility. A search of the New Mexico State Engineer's files shows 43 water wells or points of diversion within two miles of the proposed AGI. The closest water well is located approximately 0.57 miles away and permitted to reach a total depth of 700 feet. All wells within a two-mile radius are shallow and will be protected via the proposed Salt Creek AGI #2 casing design, which includes a surface casing interval down to 1,000 feet that will isolate and protect all shallow groundwater resources.

In preparing this C-108 application, Geolex conducted a detailed examination of all the elements required to be evaluated in order to prepare and obtain approval for this application for Class II injection. The elements of this evaluation include:

- Identification and characterization of all hydrocarbon-producing zones of wells that surround and are present on the plant's site.
- The depths of perforated pay intervals in those wells relative to the depth of the target injection zone (Silurian-Devonian interval)
- The past and current uses of the proposed injection interval
- The stratigraphic and structural setting of the targeted zones relative to any nearby active or plugged wells, and other wells penetrating the interval
- The identification of and sample notification letter that will be sent to all surface owners, lessees, and operators within a one-mile radius of the proposed injection well
- Identification and characterization of all plugged and operating wells penetrating the proposed injection zone within a one-mile radius of the proposed injection well
- The details of the proposed injection operation, including general well design and average maximum daily rates of injection and injection pressures
- An analysis of the potential for induced seismicity based on seismic review and mapping in the area
- Reservoir injection simulations to evaluate the resultant effects of injection operations in the area after 30 years at the maximum daily injection rate and predict the resultant acid gas dispersion plume

- Sources of injection fluid and compatibility with the formation fluid of the injection zone
- Location and identification of any freshwater-bearing zones in the area; the depth and quality of available groundwater in the vicinity of the proposed well, including a determination that there are no structures which could possibly communicate the disposal zone with any known sources of drinking water

Based upon this detailed evaluation, Northwind Midstream has determined that the proposed AGI well is a safe and environmentally sound project for the disposal of treated acid gas. Furthermore, our analyses demonstrate that the proposed injection wells will not negatively affect any waters of the State, nor have any actual or potential impacts on production in the area. This application is fully protective of correlative rights.

## 2.0 INTRODUCTION AND ORGANIZATION OF THE C-108 APPLICATION

The completed NMOCD Form C-108 is included before the Table of Contents of this document and references appropriate sections where data required to be submitted are included.

This application organizes and details all of the information required by NMOCD and NMOCC to evaluate and approve the submitted Form C-108 – Application for Authorization to Inject. This information is presented in the following categories:

- A detailed description of the location, construction, and operation of the proposed injection well (Section 3.0)
- An overview of the acid gas characteristics and modeling simulation results to predict the resultant acid gas plume and reservoir pressure effects from injection operations in the area of the proposed AGI (Section 3.0)
- A summary of the regional and local geology, hydrogeology, and the location of drinking water wells within the area of review (Section 4.0)
- The identification, location, status, production zones, and other relevant information on oil and gas wells within the area of review (Section 5.0)
- The identification and required notification for operators and surface landowners that are located within the area of review (Section 6.0)
- An affirmative statement, based on the analysis of geological conditions at the site that there is no hydraulic connection between the proposed injection zone and any known sources of drinking water (Section 7.0)

In addition, this application includes the following supporting information:

- **Appendix A:** Data tables showing all active, temporarily abandoned, abandoned and plugged oil and gas wells included within a two-mile radius and the one-mile area of review in addition to associated plugging documents for wells within one mile.
- **Appendix B:** Tables summarizing the operators, lessees, and surface owners in the one-mile radius area of review, an example of the notification letter that will be sent out to these parties at least 20 days prior to the NMOCD hearing, and a draft public notice.
- **Appendix C:** Groundwater sample request letter and associated certified mail documents

### 3.0 PROPOSED CONSTRUCTION AND OPERATION OF SALT CREEK AGI #2

The Salt Creek AGI #2 will be drilled at approximately 2,665 feet from the south line (FSL) and 245 feet from the west line (FWL) of Section 21 (Figure 2). TAG to be injected will be routed from the Northwind Midstream Gas Processing Facility (approximately 600 feet) to on-site compression facilities that will compress and dehydrate the acid gas. The compressed TAG will then be routed to the wellhead via high-pressure NACE-compliant, corrosion resistant, lines for injection. Design details are provided in Sections 3.1 and 3.2 below.

#### 3.1 DESIGN OF SALT CREEK AGI #2

The location of the proposed AGI well is shown in Figure 2, and a schematic of the injection system is shown in Figure 3. The Salt Creek AGI #2 well will be drilled to a total depth of 18,650 feet TVD, set within the Fusselman Formation. The injection interval (from approximately 17,550 feet – 18,650 feet) will be completed as an open-hole injection interval that includes the Devonian, Wristen, and Fusselman formations.

The AGI facilities and well will be integrated components of the Northwind Midstream Gas Processing Facility design and the proposed Salt Creek AGI #2, combined with the approved Salt Creek AGI #1, will provide operational redundancy at the Northwind Facility, with respect to acid gas disposal operations. The preliminary well design for the Salt Creek AGI #2 is shown in Figure 4. The well is designed to accommodate injection of twelve (12) MMSCF per day of TAG for a design life of 30 years.

Salt Creek AGI #2 will utilize a five-string casing design. The surface casing (24-inch) will be set within competent strata above the Salado Formation, within the Rustler Formation, at approximately 2,080 feet TVD to isolate shallow groundwater resources in the Dockum Formation from the acid gas injectate. The first intermediate casing string will be set at approximately 3,700 feet TVD and will provide individual isolation of the Salado Salt interval. The second intermediate casing will extend to the Lamar Formation at approximately 5,325 feet TVD. The third intermediate casing string will be 9 5/8 inches and will be set within the Wolfcamp Formation at approximately 11,880 feet TVD to aid in the isolation of the lower pressured Delaware Mountain Group and Bone Spring formation from the underlying, higher-pressure zones of the Wolfcamp, Strawn, Atoka, and Morrow formations. The 7-inch production casing will be set in a competent geologic unit within the Devonian at an approximate depth of 17,550 feet. The injection interval will consist of a 5 7/8-inch, open-hole completion interval to a total depth of 18,650 feet in the Fusselman Formation.

As shown in Figures 3 and 4, the Salt Creek AGI #2 well design will include a subsurface safety valve on the production tubing to assure that injected fluids are prevented from flowing back out of the well in the event of a failure of injection equipment. Additionally, the annular space between the production tubing and the well bore will be filled with an inert fluid (corrosion-inhibited diesel fuel with biocide additives) as a further safety measure. These practices are consistent with injection well designs previously supported by NMOCD and approved by the NMOCC for acid gas injection and conform to industry best practices for AGI well design.

Design and material considerations for Salt Creek AGI #2 include: 1) Placement of the Subsurface Safety Valve (SSSV) and permanent packer; 2) installation of three casing strings to isolate and protect groundwater resources and active producing zones; 3) characterization of the injection zone; and 4) a total depth (TD) ensuring accurate identification of the reservoir.

A suitable drilling rig will be chosen for the job that will include an appropriately sized blowout preventer and choke-manifold system for any unforeseen pressures encountered, and operations to drill the Salt

Creek AGI #2 will utilize a closed-loop system to manage drilling fluids. Visual inspections of cement returns to the surface will be noted in cementing operations of all casing strings. Casing and cement integrity will be demonstrated by pressure testing and 360-degree cement bond logs recorded for each cement operation. A schematic of the proposed well is shown in Figure 4 and the Salt Creek AGI #2 casing plan is summarized in Table 1.

**Table 1. Summary of proposed casing schedule**

Casing	Hole Size (in.)	Csg. Size (in.)	Pounds Per Foot	Grade	Thread	Top (ft.)	Bottom (ft.)	Length (ft.)
<i>Proposed Casing</i>								
Conductor	36	30	118	-	Welded	0	120	120
Surface	26	24	186.4	X-56	XLF	0	2,080	2,080
1 <sup>st</sup> Intermediate	22	20	133	J55	BTC	0	1,922	1,922
1 <sup>st</sup> Intermediate	22	20	133	P110	Liberty LD	1,922	3,700	1,778
2 <sup>nd</sup> Intermediate	17.5	13.625	88.2	Q-125HC	BTC	0	5,325	5,325
3 <sup>rd</sup> Intermediate	12.25	9.625	47	L-80HC	BTC	0	9,332	9,332
3 <sup>rd</sup> Intermediate	12.25	9.625	47	P110HP	BTC	9,332	11,879	2,547
Production	8.5	7	32	P110EC	VAMTOP	0	17,250	17,250
Production (CRA)	8.5	7	32	G3 (CRA)	VAMTOP	17,250	17,550	300
<i>Injection Tubing</i>								
Tubing	N/A	3.5	9.2	L-80	VAMTOP	0	17,200	17,200
Tubing (CRA)	N/A	3.5	9.2	G3 (CRA)	VAM	17,200	17,500	300

The conductor and surface casing will be cemented to the surface, using appropriate conventional cement and methods. These cement jobs will be pressure tested and 360-degree cement bond logs will be recorded after the required amount of time has passed for the cement to set. Once the integrity of cementing operations has been verified, the production-casing borehole will be advanced to the anticipated total depth of approximately 17,550 feet.

The 7-inch production casing will be set in a competent bed within the Devonian Formation at approximately 17,550 feet as described above (Table 1). The interval will be cemented in two stages utilizing a cement diverter tool (DVT) and ECP at a depth of approximately 15,080 feet. As shown in Table 1 above, approximately 300 feet of corrosion-resistant alloy (CRA) casing and tubing will be utilized to protect lower well components and assure well integrity in potentially corrosive conditions. To provide an additional layer of safety, this interval of CRA materials will be cemented utilizing corrosion-resistant cement (e.g., LockCem, WellLock, or equivalent), which is specially designed for use in such conditions. Following cementing operations for the production string of casing, the open-hole injection interval will be drilled to the well's total depth of approximately 18,650 feet. Table 2 below summarizes the preliminary cement program for all proposed Salt Creek AGI #2 casing strings.

**Table 2. Salt Creek AGI #2 proposed cementing plan**

Casing String	Stage #	Cement Type	No. of Sacks	Density (#/gal)	Coverage Interval
Conductor	1	Redimix	-	-	0' – 120'
Surface	1	Lead: Hal Cem C Tail: HalCem C	Lead: 963 Tail: 517	Lead: 13.5 Tail: 14.8	0' – 2,080'
1 <sup>st</sup> Intermediate	1	Lead: HalCem C Tail: HalCem C	Lead: 1,629 Tail: 204	Lead: 13.5 Tail: 14.8	0' – 3,700'
2 <sup>nd</sup> Intermediate	1	Lead: NeoCem IL2 Tail: VersaCem H	Lead: 498 Tail: 190	Lead: 11.5 Tail: 14.8	3,556' – 5,325'
	2	Lead: EconoCem HCL Tail: HalCem C	Lead: 1,421 Tail: 190	Lead: 12.5 Tail: 14.5	0' – 3,556'
3 <sup>rd</sup> Intermediate	1	Lead: NeoCem PL2 Tail: VercaCem H	Lead: 779 Tail: 296	Lead: 11.5 Tail: 14.5	7,285' – 11,879'
	2	Lead: EconoCem HLC Tail: VersaCem H	Lead: 2,634 Tail: 156	12.5 14.5	0' – 7,285'
Production	1	Lead: NeoCem PT2 Tail: LockCem	Lead: 48 Tail: 48	13.2 15.3	15,080' – 17,550'
	2	Tail: NeoCem PT	Tail: 1,895	13.2	0' – 15,080'

Permanent, continuous-recording sensors will be incorporated into the packer assembly and appropriate connections will be run through the annulus and out of the wellhead. These sensors will provide real-time reservoir temperature and pressure conditions. Data will be transmitted to the plant's control room for observation, analysis, and recording.

The subsurface safety valve (SSSV) will be run into the well at a depth of approximately 250 feet and connected to the surface via a ¼-inch Inconel hydraulic line. From the surface, the line is run to the surface control panel through a stainless-steel line.

The National Association of Corrosion Engineers (NACE) issues guidelines for metals exposed to various corrosive gases like those anticipated for this well. For an H<sub>2</sub>S-CO<sub>2</sub> stream of acid gas that is dewatered at the surface via successive stages of compression, down-hole components, such as the SSSV and packer should be constructed of Inconel 925 (or equivalent). The CRA joints utilized in Salt Creek AGI #2 will be constructed of a similar alloy from a manufacturer, such as Sumitomo SM2550 (with 50% nickel content). Additionally, the gates, bonnets, and valve stems within the injection tree will also be nickel coated.

The remainder of the injection tree will be constructed of standard carbon steel components and outfitted with annular pressure gauges that report operating pressure conditions in real time to a gas-control center located remotely from the wellhead. In the case of abnormal pressures or any other situation requiring immediate action, the acid gas injection process can be stopped or diverted to AGI #1 at the compressor, and the wellhead can be shut in using a pneumatically operated wing valve on the injection tree. The SSSV provides a redundant safety feature to shut in the well in case the wing valve does not close properly. After the AGI well is drilled and tested to assure that it will be capable of accepting the target volume of injection fluid (without using acid gas), it will be completed with the approved injection equipment for the acid gas stream.

### 3.2 GEOPHYSICAL LOGGING

Prior to running the production casing string, open-hole geophysical logging will be performed for the interval underlying the casing from 11,879 feet to 17,550 feet and within the open-hole injection interval

from 17,550 feet to 18,650 feet. Due to the close proximity to Salt Creek AGI #1 (approximately 255 feet), no shallow geophysical logging (excluding gamma ray from MWD) are planned, as these intervals will be logged in detail for the AGI #1 location. The proposed open-hole logging suite for deeper geologic sections will consist of the following: Gamma ray, formation density, resistivity, neutron porosity, sonic porosity, and 360-degree caliper measurements with integrated borehole volume. Additionally, Fullbore Formation MicroImager (FMI) logs will be recorded along the proposed injection interval, as well as the overlying caprock to verify the integrity and confirm the capability of the overlying material to contain the injected TAG. In addition, porosity and permeability characteristics of the proposed injection zone and overlying caprock material will be verified through collection and laboratory analysis of sidewall cores.

### 3.3 RESERVOIR STIMULATION, TESTING, AND PRESSURE MONITORING

Upon completion of geophysical logging for Salt Creek AGI #2, reservoir stimulation and testing operations will be completed. These operations include acid stimulation of the injection zone and step-rate injection testing.

Stimulation operations will include a two-stage acidizing treatment of the injection zone. First, a spot-acid treatment will be performed in which approximately 3,000 gallons of 15% hydrochloric acid (HCl) will be displaced along the open-hole injection interval for approximately 24 hours to enhance injectivity. Subsequently, a complete acid stimulation job consisting of approximately 32,000 gallons of 15% HCl and approximately 8,000 gallons of gelled 15% HCL acid will be injected into the reservoir to open potential reservoir-bound fractures, secondary porosity zones, and dissolve any natural carbonate cement within the pore spaces of the Devonian-Silurian injection zone.

In addition to stimulation operations, an injection test (step-rate test) will be performed for the Salt Creek AGI #2. A temporary string containing a removable packer and tubing will be run to conduct the test to determine the final injection pressures and volumes that assures the formation parting pressure (fracture pressure) is not reached during future TAG injection operations. Once the reservoir has been tested and safe operational conditions have been identified, the final tubing string and permanent injection packer will be run in and set at an approximate depth of 17,470 feet.

The Salt Creek AGI #2 will be equipped with bottom-hole pressure and temperature instrumentation designed to provide real-time monitoring of reservoir conditions as it is installed immediately above the permanent injection packer. While this equipment is useful in gathering data that will ultimately be used to evaluate reservoir and well performance, it is only a portion of the overall data collection and analysis program to evaluate the reservoir over time and to compare the predicted reservoir performance (discussed in sections 3.3 and 3.4) with actual performance in future reporting periods.

The collection and analysis of injection and annular pressure data has a two-fold purpose. First, to provide an early warning of any mechanical well issues that may arise, and the second to provide data for reservoir performance evaluation. While the initial purpose of monitoring the mechanical integrity of the well only requires the surface injection pressure, temperature, rate, and annular pressure monitoring, the bottom-hole data provides the ability to analyze and evaluate the performance of the reservoir.

Surface pressure/temperature/annular pressure monitoring equipment has extremely high reliability, whereas, our experience with bottom-hole pressure/temperature monitoring equipment has shown that this equipment is more complex and suffers from periodic data collection and transmission issues. We have developed a process to ensure that necessary data are collected in the event of bottom-hole sensor failure. The simultaneous collection of the surface- and bottom-hole data allows us to develop empirical relationships with actual observed data that, in conjunction with the use of established models (such as,

AQUALibrium™, or equivalent) will allow us to fill in gaps when bottom-hole data loss occurs. This approach will allow us to provide NMOCD with reliable monitoring data and interpretations and provides the basis for the reservoir evaluation, which will be performed periodically during the lifetime of the well.

Below is a summary of the overall data collection and analysis program proposed for this well and reservoir:

1. Obtain initial bottom-hole pressure and temperature after drilling (during logging)
2. Perform detailed step-rate injection test and pressure fall-off test to provide baseline reservoir conditions prior to the initiation of TAG injection
3. Monitor surface parameters (injection pressure, temperature, injection rate, and annular pressure) to provide an early warning system for any potential mechanical issues in the well
4. Monitor bottom-hole pressure/temperature with a device to provide real-time reservoir condition data for analysis of reservoir performance
5. Use bottom-hole reservoir and surface pressure/temperature to develop a well-specific empirical relationship between observed surface- and bottom-hole data
6. Use TAG/wellbore model to predict bottom-hole P/T conditions based on surface data and test with empirical relationships observed in #5 above to calibrate models
7. Use surface data along with tools in #5 and #6 above to fill in missing bottom-hole data when data drops or sensor failure occurs
8. In the event of an extended period of bottom-hole pressure/temperature sensor failure, perform periodic bottom-hole pressure monitoring using slickline pressure gauges only if data from such temporary device is necessary to fill in data for relevant analysis
9. After approximately 10 years of operation, perform another detailed step-rate injection test and fall-off test to compare with baseline prior to injection

### 3.4 INJECTION STREAM CHARACTERISTICS AND MAXIMUM ALLOWABLE OPERATING PRESSURE

The Salt Creek AGI #2 well has been designed and will be constructed such that it will serve as the injection conduit for a mixed stream of treated acid gas. Based on current estimates, the TAG stream used for the following calculation will be:

- Carbon Dioxide (CO<sub>2</sub>)                      80%
- Hydrogen Sulfide (H<sub>2</sub>S)                      20%
- Trace Nitrogen and C<sub>1</sub> – C<sub>7</sub>                      <1%

The maximum total volume of TAG to be injected daily will be approximately twelve (12) MMSCF per day. Pressure reduction valves and controls will be incorporated to assure that the maximum surface injection pressure allowed by NMOCD will not be exceeded.



The specific gravity of TAG is dependent on the temperature and pressure conditions and the composition of the fluid mixture. It is most accurately calculated using a modification of the Peng-Robinson (PR) equation of state (EOS) model (Boyle and Carroll, 2002). We have calculated the specific gravity of the supercritical TAG phase for the proposed Salt Creek AGI #2 using the AQUAlibrium™ 3.1 software, which employs the modified PR EOS model (Table 3).

We have modeled the proposed maximum daily injection rate of twelve (12) MMSCF per day composed of 80 mol% CO<sub>2</sub> and 20 mol% H<sub>2</sub>S. Specific gravities of TAG were determined for the conditions at the wellhead (pressure = 1,700 psi, temperature = 110 °F) and the bottom of the well (pressure = 8,075 psi, temperature = 243 °F). The specific gravity of TAG at equilibrium with the reservoir (pressure = 7,837 psi, temperature = 236 °F) was also determined to preliminarily evaluate the area expected to be affected by injection in the reservoir (see Table 3 and Section 3.4).

The calculated maximum allowable injection pressure (MAOP) would be approximately 5,798 psi (depending on specific gravity of final TAG stream). We have used the following method approved by NMOCD to calculate the proposed MAOP. The final maximum permitted surface injection pressure should be based on the final specific gravity of the injection stream according to the following formulas:

$$IP_{Max} = PG (D_{Top})$$

Where:  $IP_{Max}$  = Maximum Surface Injection Pressure (psi)  
 $PG$  = Pressure Gradient of Injection Fluid (psi/ft.)  
 $D_{Top}$  = Depth at top of perforated interval of injection zone (ft.)

And

$$PG = 0.2 + 0.433 ( 1.04 - SG_{Tag} )$$

Where:  $SG_{Tag}$  = Average specific gravity of treated acid gas in the tubing  
( $SG_{Tag}$  at top = 0.66, and  $SG_{Tag}$  at bottom = 0.82; see Table 3)

For the maximum requested injection volume case, it is assumed that:

$$SG_{Tag} = 0.7389 \text{ (Average of 0.66 and 0.82)}$$

$$D_{Top} = 17,550 \text{ feet}$$

Therefore:

$$PG = 0.2 + 0.433 (1.04 - 0.7389)$$

$$PG = 0.3304$$

And

$$IP_{Max} = 0.3304 \frac{\text{psi}}{\text{ft}} \times 17,550 \text{ ft}$$

$$IP_{Max} = 5,798 \text{ psi}$$

For this reason, Northwind Midstream requests approval for a surface injection MAOP of 5,798 psig for the proposed Salt Creek AGI #2.

**Table 3. Reservoir Injection Pressure and Volume Calculations**

Proposed Injection Stream Characteristics

TAG	H <sub>2</sub> S	CO <sub>2</sub>	H <sub>2</sub> S	CO <sub>2</sub>	TAG
Gas Volume MMSCFD <sup>-1</sup>	Conc. Mol %	Conc. Mol %	Injection Rate lbs/day	Injection Rate lbs/day	Injection Rate lbs/day
12	20	80	227814	1176733	1404547

Conditions at Wellhead

Wellhead		TAG							
Temp F	Pressure psig	Gas Vol (MMSCFD) <sup>-1</sup>	Comp CO <sub>2</sub> :H <sub>2</sub> S	Inject Rate lbs/day	Density <sup>1</sup> kg/m <sup>3</sup>	SG <sup>2</sup>	Density lbs/gal	Volume ft <sup>3</sup>	Volume bbl
110	1700	12	80:20	1404547	660.90	0.66	5.52	34026	6060

Conditions at Bottom of Well

Wellhead		TAG							
Temp F	Pressure psig	Depth <sub>Top</sub> ft	Depth <sub>Bot</sub> ft	Thickness <sup>4</sup> ft	Density <sup>1</sup> kg/m <sup>3</sup>	SG	Density lbs/gal	Volume ft <sup>3</sup>	Volume bbl
243	8075	17550	18650	1100	816.98	0.82	6.82	27526	4903

Conditions in Reservoir at Equilibrium

Wellhead		TAG							
Temp <sup>5</sup> F	Pressure <sup>3</sup> psig	Avg. Porosity	S <sub>WR</sub>	Porosity (ft)	Density <sup>1</sup> kg/m <sup>3</sup>	SG <sup>2</sup>	Density lbs/gal	Volume ft <sup>3</sup>	Volume bbl
236	7837	4.5	0.36	45.75	829.69	0.83	6.93	27104	4827

### 3.5 ACID GAS INJECTION PLUME MODELING

To evaluate the impact of operation of the proposed Salt Creek AGI #2 well on the target Siluro-Devonian reservoir, Geolex collaborated with Sproule in constructing a geologic reservoir model to complete a detailed reservoir evaluation and injection modeling assessment. Components of this evaluation included: 1) Review of available subsurface data (e.g., geophysical logs and drill-stem and injection tests) to identify and estimate reservoir characteristics in the area of the proposed AGI well location, and 2) construction of a geologic simulation grid and injection model utilizing Schlumberger Petrel and Eclipse platforms, respectively.

#### 3.5.1 Siluro-Devonian Reservoir Evaluation

Upon review of available subsurface data, six discrete zones were identified within the target injection reservoir delineated by their porosity and permeability characteristics (Table 4). Within these zones, interpreted porosity types include solution-enhanced primary porosity (SEP), solution-enhanced fracture porosity (SEF), and small-fracture porosity (FX). Utilizing available log data, porosity within each zone was estimated utilizing the density and neutron logs.

**Table 4. Summary of reservoir characteristics within each discrete zone identified in the Siluro-Devonian injection interval near Salt Creek AGI #2**

Zone	Zone Thickness	$\Phi$ Type	$\Phi$ *Thickness	Average $\Phi$ (%)	$\Phi$ Range (%)	Average K (mD)
4	100	SEP, SEF	9	9	2-15	200
5	99	SEP, SEF	8.91	9	2-12	100
6	121	SEP	4.84	4	1-6	30
7	255	-	0	0	0	0
8	204	SEP, FX	8.16	4	0-8	70
9	247	SEF, SEF, FX	14.82	6	2-12	150

Generally, average porosity values within each identified zone range from approximately 0% to 9% and the total proposed Siluro-Devonian injection interval exhibits an average porosity of 4.5%. Average permeability values were estimated from nearby porosity logs and where additional drill-stem tests, or adequate resistivity log data were available and were further informed by extensive dolomite permeability studies of Lucia et al. (1995).

### 3.5.2 Acid Gas Injection Modeling

To simulate the proposed injection scenario and better understand the potential resultant acid gas injection plume after 30 years of operation at the maximum anticipated daily injection rate (12 MMSCF per day), Geolex collaborated with Sproule to complete a detailed reservoir injection simulation. This modeling evaluation was completed utilizing Schlumberger Petrel to construct a geologic simulation grid informed by the previously described reservoir evaluation and available well data in the area of Salt Creek AGI #2. Schlumberger Eclipse was then utilized to conduct injection simulations representative of the proposed injection scenario described in this application.

The geologic simulation grid constructed as the environment, in which the proposed injection scenario was simulated, is comprised of 292 simulation layers characterizing the six distinct intervals identified within the proposed injection reservoir. The simulation model area covers approximately 30 square miles and includes nearby subsurface features. There are no active injection wells within this area and although there have been saltwater disposal well applications submitted, none have been authorized. In total, the simulation grid contains 923,000 cells with areal dimensions of 500 by 500 feet.

Porosity and permeability characteristics within the simulation environment were defined utilizing available well-log data and reservoir characteristics identified during the evaluation discussed in Section 3.5.1. From this data, a model distribution for porosity, and subsequently permeability, was generated (Figure 5). Model permeability distribution was determined using the Winland R35 method as normal and beta distribution methods generated no instances of simulation cells with permeability less than 0.1 mD.

Following construction of the model simulation grid, the proposed injection scenario was simulated utilizing the Schlumberger Eclipse simulation platform. Specific scenarios simulated include operation of the proposed AGI at the maximum anticipated injection rate (12 MMSCFD). Subsurface faults in the area of review were assumed to be non-transmissive of fluids (sealed).

Figure 6 illustrates the results of Eclipse injection modeling for the proposed Salt Creek AGI #2. After 30 years of injection at the maximum anticipated rate of 12 MMSCF per day, the resultant acid gas plume would occupy an area with an approximate diameter of 2.6 miles and is not predicted to reach any wells (active or inactive) that penetrate the target injection interval.

### 3.5.3 Potential for Vertical Migration of Acid Gas to Overlying Productive Zones

Results of the injection system simulations predict that some fraction of acid gas injectate will exhibit a dispersion pattern such that gas reaches local fault features in the area. These features represent potential conduits allowing the vertical transmission of acid gas out of the target injection reservoir and into overlying productive zones. To address this concern, Geolex reviewed available drilling fluid records in the area of the proposed AGI. Additionally, published literature evaluating regional reservoir pressure conditions in the Delaware Basin were utilized. Based on this analysis, we determined these sealed faults could not result in an escape of TAG from the injection zone.

Illustrated in Figure 7 are wells and associated drilling fluid densities utilized while drilling through overlying producing zones in the area of the Salt Creek AGI #2 well. Above the proposed Siluro-Devonian injection reservoir mud weights utilized range from 11.9 to 15.1 pounds per gallon (ppg). For those wells identified that penetrate the proposed injection reservoir, fluid records indicate utilization of less dense fluids (average of 9.0 ppg). These records support the interpretation that overlying producing zones in this area are over-pressured with respect to the target injection reservoir.

Over-pressured reservoir conditions within the Lower Bone Springs to Woodford formation strata have been recognized in many areas of the eastern Delaware Basin (Luo et al., 1994). Rittenhouse et al. (2016) generated a regional pore-pressure model of the Delaware Basin informed by over 23,700 drilling fluid recordings and more than 4,000 drill-stem and fracture injection tests. As shown in Figure 8, these compiled fluid records and testing operations indicate increased pore-pressure gradients from Lower Bone Springs to Woodford Formation strata expressed in the utilization of heavier drilling fluids. Normal pressure conditions are observed to return underlying the Woodford Shale.

Based on the record of local drilling fluids utilized and extensive records compiled by Rittenhouse et al. (2016), the proposed Siluro-Devonian injection reservoir at this location is anticipated to be under-pressured with respect to overlying strata. Under these conditions, there is no anticipated potential for the vertical migration of acid gas out of the target reservoir as the pressure differential between the over- and under-pressured intervals will act as a barrier impeding vertical migration, even along potential conduits.

## 4.0 REGIONAL AND LOCAL GEOLOGY AND HYDROGEOLOGY

### 4.1 GENERAL GEOLOGIC SETTING AND SURFICIAL GEOLOGY

The proposed Salt Creek AGI #2 site is located in Section 21, T26S, R36E in Lea County, New Mexico, approximately 7.5 miles southwest of Jal (Figure 1). The well location lies on the eastern flank of the topographic Pecos River Basin within the Javelina Basin. Generally, the area is flat and covered predominantly by sand dunes overlying a hard caliche surface. The dunes are locally stabilized with shin oak, mesquite, and some burr grass. There are no observed surface bodies of water, or groundwater discharge sites within one mile of the proposed location. Where drainages exist in interdunal areas, they are ephemeral, discontinuous, dry washes. The proposed well site is underlain by Quaternary alluvium overlying the Triassic redbeds of the Santa Rosa Formation (Dockum Group), both of which are local sources of groundwater. The thick sequences of Permian rocks that underly these deposits are described generally below.

### 4.2 BEDROCK GEOLOGY

The Northwind Midstream Gas Processing Facility and the proposed well are located at the northern margin of the Delaware Basin, a sub-basin of the larger, encompassing Permian Basin (Figure 9), which covers a large area of southeastern New Mexico and west Texas. The Permian as we know it today began to take form during the Middle to Late Mississippian, with various segments (Delaware Basin, Midland Basin, Central Basin Platform, and North Platform) arising from the ancestral Tabosa Basin. The Delaware Basin was subsequently deepened by periodic deformation during the Hercynian Orogeny of the Pennsylvanian through Early Permian. Following the orogeny, the Delaware Basin was structurally stable and gradually was filled by large quantities of clastic sediments while carbonates were deposited on the surrounding shelves and was further deepened via basin subsidence.

Figure 10 illustrates a generalized Permian Basin stratigraphic column showing the anticipated formations and lithologies that underlie the proposed well site. The entire Lower Paleozoic interval (Ellenburger through Devonian) was periodically subjected to subaerial exposure and prolonged periods of karsting, most especially in the Fusselman and Devonian intervals. The result of this exposure was development of systems of karst-related secondary porosity, which included solution-enlargement of fractures and vugs, and the development of small cavities and caves. Particularly in the Fusselman, solution features from temporally distinct karst events became interconnected with each successive episode of subaerial exposure, so there is the potential for vertical continuity in parts of the Fusselman that could lead to enhanced vertical and horizontal permeability.

The sub-Woodford Paleozoic rocks extend down to the Ordovician Ellenburger Formation, which is separated from underlying basement rock by a limited interval of Early Ordovician sandstones and granite wash. The Ellenburger is comprised of dolomites and limestones and can be several hundred feet thick. It is overlain by approximately 880 feet of Ordovician Simpson Formation sandstones, shale, and tight limestones, as well as approximately 480 feet of basal Montoya cherty carbonates.

The Silurian Fusselman and Wrysten and Devonian Thirty-one formations overlie the Montoya Formation and are comprised of interbedded dolomites and dolomitic limestones that are capped by the Woodford Shale. The Woodford Shale is overlain by several hundred feet of tight Osagean limestone and several hundred feet of shale and basinal limestones of the Upper Mississippian Barnett Formation. The overlying Pennsylvanian Morrow, Atoka, and Strawn Formations complete the pre-Permian section. Within this entire sequence, wells have historically produced gas from the Strawn, however, gas production in the area is limited to only one nearby well producing from the Strawn Formation. Active oil production within the area of review of the proposed AGI well is found predominantly in the Tansill-

Yates-Seven Rivers pool and horizontal plays (active and permitted) within the Bone Spring, and Wolfcamp. The deepest currently producing formation, the lower Permian Wolfcamp, is approximately 4,200 feet above the target injection zone.

#### 4.3 LITHOLOGIC AND RESERVOIR CHARACTERISTICS OF THE DEVONIAN-SILURIAN FORMATIONS

The proposed injection interval for the Salt Creek AGI #2 includes the Devonian and Silurian Wristen and Fusselman formations (collectively referred to as Siluro-Devonian). These strata are comprised of carbonates with high permeability such as porous limestones or dolostones with moderate to high pore space that are well-demonstrated intervals that are anticipated to readily accept and sequester acid-gas. In evaluating the proposed Salt Creek AGI #2 location, Geolex determined that the Devonian and Silurian injection reservoirs exhibited sufficient porosity potential to accommodate the needs of the Northwind Midstream proposed operations.

Based on the geologic analysis of the subsurface, acid-gas injection and CO<sub>2</sub> sequestration is recommended between the depths of approximately 17,550 feet to 18,650 feet. The proposed injection zone consists of 1,100 feet of Siluro-Devonian Wristen and Fusselman formations. These units are comprised predominantly of porous carbonates that would readily accept TAG for permanent sequestration. Figure 11 is an interpreted type-log, showing the lithology of the subsurface formations. Anticipated formation tops are included in Table 5. Over 10,000 feet of Permian, Pennsylvanian and Mississippian formations lie between the Delaware Mountain Group and the proposed Devonian-Silurian injection zone selected for Salt Creek AGI #2.

The primary caprock for the Devonian-Silurian zone is the upper Devonian Woodford Shale, approximately 360 feet thick in this area. The Woodford is overlain, in turn, by approximately 2,200 feet of tight shales and carbonates of the Morrow, Barnett, and Osage formations. These units provide an excellent geologic seal above the porous carbonates of the injection zone, additionally providing protection to shallow groundwater resources and overlying pay intervals.

Figure 12 shows a structural contour map covering the area of the proposed AGI well and Figure 13 highlights the lateral extent of available lower Devonian porosity and regional coverage of the overlying caprock. The proposed location is on a southwestern-dipping slope, and there is no indication of any significant faulting that would impact the Silurian-Devonian injection zone.

Figure 14 includes a structural cross section SCD-SCD' in the area of the proposed Salt Creek AGI #2 with the wells employed shown in Figure 13. Geophysical logs from included wells indicate several intervals within the proposed injection zone (Devonian – Fusselman formations) have an average porosity of 9% (Figure 14 - yellow shaded intervals) and the anticipated low-porosity and low-permeability caprock material is shown to be present through the area of interest.

**Table 5. Anticipated formation tops at the proposed Salt Creek AGI #2 location**

Formation	Depth (MD)	Formation	Depth (MD)
Surface	0	Bone Spring	8,479
Dockum	669	Wolfcamp	11,826
Ochoa-Dewey	1,247	Strawn	12,748
Rustler	2,076	Atoka	13,335
Salado	2,359	Morrow	14,981
Yates	3,160	Barnett	16,462
7 Rivers	3,334	Osage	16,724
Castile	3,737	Woodford	17,186
Lamar	5,305	Devonian	17,550
Bell Canyon	5,410	Wristen	17,953
Cherry Canyon	6,273	Fusselman	18,403
Brushy Canyon	6,950	Montoya	18,907

#### 4.4 CHEMISTRY OF THE RESERVOIR FLUIDS

A review of formation waters from the U.S. Geological Survey National Produced Waters Geochemical Database v. 2.3 (retrieved on June 21, 2022) identified eight wells with analyses from drill stem tests fluids collected from the Devonian-Silurian interval in wells within approximately 15 miles of the proposed Salt Creek AGI #2. Table 6 below summarizes the observed formation fluid characteristics.

**Table 6. Summary of produced water analyses from nearby wells (U.S. Geological Survey National Produced Water Geochemical Database v. 2.3)**

API	Concentration (parts per million)						
	TDS	HCO <sub>3</sub>	Ca	Cl	Na	Mg	SO <sub>4</sub>
3002511568	55183	1158	2451	31600	17310	860	1804
3002511812	99879	687	4753	60410	32610	828	591
3002511818	27506	1089	1384	15270	8144	540	1079
3002511863	158761	476	17240	100300	35400	5345	N/A
3002511886	101036	540	5393	61630	30380	2183	910
3002511890	80055	934	6384	48090	22550	139	1958
3002511950	31931	302	7196	20450	1151	2241	591
3002512386	56776	66	5407	35590	14380	1333	N/A

These analyses show Total Dissolved Solids (TDS) in the area of the proposed AGI well ranging from 31,931 to 158,761 parts per million (ppm) with an average of 76,391 ppm. The primary constituent in sampled formation waters is the chloride ion, with an average concentration of 46,667 ppm.

Based on this data, the Siluro-Devonian reservoir fluids are anticipated to be completely compatible with the acid gas injectate, however, an attempt will be made to sample formation fluids during drilling and completion of the proposed Salt Creek AGI #2 to provide more site-specific fluid properties and verify our assessment of fluid compatibility.

#### 4.5 GROUNDWATER HYDROLOGY IN THE VICINITY OF THE PROPOSED AGI WELL

Based on the New Mexico Water Rights Database from the New Mexico Office of the State Engineer, there are 43 water wells or points of diversion located within a two-mile radius of the Salt Creek AGI #2 well, and six water wells within a one-mile radius (and none within a one-half mile radius). Of these wells, the closest is located approximately 0.57 miles away (Figure 15; Table 7). All wells with known depths within the two-mile radius are shallow, collecting water from about 175 feet to 800 feet depth, in alluvium and Triassic redbeds. The shallow freshwater aquifer will be protected by a five-string casing design including a surface casing interval that extends to 1,690 feet within the Rustler Formation, effectively isolating shallow groundwater resources (Figure 4).

The area surrounding the proposed injection well is arid and there are no bodies of surface water within a two-mile radius.

**Table 7. Water wells or points of diversion within one mile of the proposed Salt Creek AGI #2 (Retrieved from the New Mexico Office of the State Engineer's Files on August 18, 2022)**

POD Number	Source	Use	Owner	Latitude (NAD83)	Longitude (NAD83)	Depth (ft)	Date Completed	Distance (mi)
J 00025 POD1	-	Commercial	NGL SOUTH RANCH INC	32.020951	-103.280668	-	-	0.57
J 00038 POD1	Shallow	Exploration	BECKHAM, BRAD	32.020556	-103.279723	-	-	0.58
J 00051 POD2	-	Exploration	CITY OF JAL	32.039703	-103.285656	-	-	0.88
J 00002 POD6	-	Municipal	CITY OF JAL	32.030559	-103.293448	-	-	0.93
J 00038 POD2	Shallow	Exploration	BECKHAM, BRAD	32.021667	-103.263611	-	-	0.97
J 00025 POD2	Artesian	Commercial	NGL SOUTH RANCH INC	32.021667	-103.263611	800	4/3/2017	0.97

In lieu of recent groundwater sample collection and chemical analysis, Geolex conducted a review of *Geology and Ground-Water Conditions in Southern Lea County, New Mexico* (Nicholson and Clebsch, 1961) to identify published groundwater data representative of nearby water wells in the area (within less than 10 miles) of the proposed Salt Creek AGI #2 well. Table 8 summarizes the four wells identified in this review and the results of those chemical analyses.

**Table 8. Chemical analysis results of samples collected from water wells in the area of the proposed Salt Creek AGI #2 (Nicholson and Clebsch, 1961, *Geology and Ground-Water Conditions in Southern Lea County, New Mexico*)**

Historical Owner	Location (T-R-S)	Depth (ft)	Ca (eq)	Na+K	HCO <sub>3</sub>	SO <sub>4</sub>	Cl	NO <sub>3</sub>	Hardness	pH
-	26S-35E-13	230	<u>6.72</u>	-	207	233	73	-	336	7.3
W.D. Dinwiddie	26S-33E-3	180	<u>8.72</u>	-	306	110	57	-	436	7.3
City of Jal	25S-37E-19	500	55	170	376	280	71	0.4	338	-
	25S-37E-19	450	34	175	264	286	54	0.5	262	-
El Paso Natural Gas	25S-37E-20	70	102	77	150	145	168	7.6	386	-
	25S-37E-20	47	<u>7.96</u>	-	191	200	145	-	398	7.5

Underlined values are represented in terms of equivalents per million; others are expressed in parts per million.

Our analysis confirms that the proposed well poses no risk of contaminating groundwater in the area as 1) the proposed well design includes material considerations to protect shallow groundwater resources and, 2) there are no identified conduits that would facilitate migration of injected fluids to fresh-water zones.



#### 4.6 POTENTIAL FOR INDUCED SEISMICITY IN THE AREA

To evaluate the potential for seismic events in response to injected fluids, Geolex conducted an induced-seismicity risk assessment in the area of the proposed Salt Creek AGI #2. This estimate 1) Models the impact of four waste disposal wells over a 30-year period and 2) estimates the fault slip probability associated with the anticipated injection scenario. The analysis was completed utilizing the Stanford Center for Induced and Triggered Seismicity's (SCITS) Fault Slip Potential (FSP) modeling package.

Based on detailed review of the subsurface, Geolex identified five faults, located approximately within five miles of the proposed well and striking approximately north-northwest to south-southeast (Figure 16). These subsurface features, relative to the other active and proposed injection wells in the area, are separated by significant distances and are not anticipated to be susceptible to injection-induced slip. To verify these structures would not be affected by approval of the proposed Salt Creek AGI #2, a model simulation was performed, despite their significant distance from the area of review.

To calculate the fault slip probability for this injection scenario, input parameters characterizing the local stress field, reservoir characteristics, sub-surface features, and injected fluids are required. Parameters utilized and their sources for this study are included in Table 9 below. Additionally, Table 9 details the injection volume characteristics and locations of the disposal wells modeled in this scenario.

For this study, limitations of the FSP model required a conservative approach be taken in determining the fault slip probability of the injection scenario. Specifically, the FSP model is only capable of considering a single set of fluid characteristics and this study aims to model an injection scenario that includes saltwater disposal (SWD) and acid gas injection systems. To ensure a conservative fault slip probability estimate, the proposed AGI well was modeled utilizing the characteristics of an SWD. This approach yields a more conservative model prediction as water displays greater density, dynamic viscosity, and is significantly less compressible than acid gas. Characteristics of acid gas at anticipated reservoir conditions, as modeled by AQUAlibrium™, are shown in Table 9.

Generally, faults considered in this assessment are predicted by the Stanford FSP Model to have very low potential for injection-induced slip and the proposed Salt Creek AGI #2 is not predicted by the FSP model to contribute significantly to the total resultant pressure front. All faults within the modeled study area show no increase in slip probability throughout the 30-year modeled scenario (Figures 13 & 14). Table 11 summarizes the predicted pressure change along each fault and includes the model-derived pressure conditions necessary to induce slip for each feature. Modeled pressure increases along faults after 30 years fall far short of the required pressure increase to induce slip.

**Table 9. Input parameters and source material for FSP simulations**

Modeled Parameter	Input Value	Variability (+/-)	UOM	Source
<i>Stress</i>				
Vertical Stress Gradient	1.05	0.105	psi ft <sup>-1</sup>	Nearby well estimate
Max Horizontal Stress Direction	N75E	5	Deg.	Lund Snee & Zoback, 2018
Reference Depth	17,600		ft	Nearby well evaluation
Initial Res. Pressure Gradient	0.43	0.043	psi ft <sup>-1</sup>	Lund Snee & Zoback, 2018
A <sub>φ</sub> Parameter	0.6	0.06	-	Lund Snee & Zoback, 2018
Reference Friction Coefficient (μ)	0.6	0.06	-	Standard Value
<i>Hydrologic</i>				
Aquifer Thickness	1100	10	ft	Nearby well evaluation
Porosity	4.5	0.45	%	Nearby well evaluation
Permeability	25	2.5	mD	Nearby well evaluation
<i>Material properties</i>				
Density (Water)	1040	20	kg m <sup>-3</sup>	Standard Value
Dynamic Viscosity (Water)	0.0008	0.0001	Pa.s	Standard Value
Fluid Compressibility (water)	3.6 x 10 <sup>-10</sup>	0	Pa <sup>-1</sup>	Standard Value
Rock Compressibility	1.08 x 10 <sup>-9</sup>	0	Pa <sup>-1</sup>	Standard Value
<i>Acid gas @ 236 °F, 7,837 psi</i>				
Density	818.18	-	kg m <sup>-3</sup>	AQUALibrium™
Dynamic Viscosity	0.0000806	-	Pa.s	AQUALibrium™

**Table 10. Location and characteristics of injection wells modeled in FSP assessment**

#	API	Well Name	Latitude	Longitude	Volume (bbls/day)	Start (year)	End (year)
1	30-025-43360	Kimberly SWD #001	32.08353	-103.194274	20,000	2019	2053
2	30-025-49974	Independence Fee AGI #2	32.120062	-103.291025	4,265	2023	2053
3	30-025-48081	Independence AGI #001	32.120835	-103.291025	4,265	2021	2053
4	TBD	Thunderbird SWD No. 1	32.09463	-103.2967	50,000	2023	2053
5	TBD	Hornet SWD No. 1	32.06601	-103.3116	50,000	2023	2053
6	TBD	Salt Creek AGI #2	32.028828	-103.277809	4,917	2023	2053

Daily maximum injection volumes utilized in the FSP model range from 4,265 to 50,000 bpd (Table 10). In submission of this application, Northwind is requesting approval to operate the proposed Salt Creek AGI #2 for a period of at least 30 years. Additionally, history matching for a period of four and two

additional years was completed for two of the wells to assure the simulation results also consider the historical impact of injection wells that have been operating since 2019 and 2021. Figure 17 shows the resultant pressure front, single well radial solutions, and the predicted pressure change at the fault midpoints; Figure 18 shows the model-predicted fault slip potential throughout time injection scenario for all wells operating at maximum capacity. This approach yields a more conservative model prediction that ensures the impact of operations from Northwind AGI wells will not pose an increased risk of induced seismicity. The predicted pressure change along each fault segment in the year 2053 and model-derived pressure change necessary to induce slip for each feature are included in Table 11 below.

**Table 11. Summary of model-simulation results showing the required pressure change to induce fault slip, actual pressure change as predicted by the FSP model, probability of fault slip at the end of the 30-year injection scenario, and fault slip probability when proposed AGI is excluded**

Fault #	$\Delta$ Pressure necessary to induce fault slip	Actual $\Delta$ Pressure at fault midpoint at year 2053	Fault Slip Potential at year 2053
1	7,088	29	0.0
2	6,931	36	0.0
3	7,071	55	0.0
4	1,313	97	0.0
5	1,302	109	0.0
6	1,606	80	0.0
7	7,047	58	0.0
8	4,432	51	0.0
9	5,240	59	0.0
10	1,608	60	0.0
11	1,565	64	0.0
12	1,272	75	0.0
13	1,536	90	0.0
14	1,304	127	0.0
15	1,579	179	0.0

In summary, no structures included in the modeled simulations are expected to experience any significant increase in slip potential, and modeled pressure increases along faults fall significantly short of the required pressure increase to induce slip. Furthermore, radial pressure solutions calculated for each simulated injection well illustrate that the operation of the proposed AGI well will have little impact on conditions near identified faults in the area.

## 5.0 OIL AND GAS WELLS IN THE SALT CREEK AGI AREA OF REVIEW AND VICINITY

Appendix A summarizes in detail all NMOCD recorded wells within a one- and two-mile radius of the proposed Salt Creek AGI #2. These wells are shown in Figure A-1 and include active, plugged, and permitted well locations. Table A-1 summarizes all wells within two miles of the proposed AGI well location and wells located within one mile of the proposed AGI location are included in Table 12 below.

In total, there are 150 wells within a two-mile radius of the proposed Salt Creek AGI #2 (Appendix A, Figure A-1, Table A-1). Of these wells, 25 are active, 22 are permitted, and 72 are plugged (and an additional 31 are cancelled locations). Among the 72 plugged wells is a saltwater disposal well, Lea 20 #1 (API: 30-025-25957), that was active from 1978-2017 injecting fluid into the depth interval from 3,323 feet to 3,420 feet. The Lea 20 #001 was plugged and abandoned in January 2021. Active wells are primarily producing from Tansill-Yates-7Rivers, Lower Bone Spring, and Wolfcamp pools. One active gas well is present within two miles of the proposed AGI and produces resources from the Strawn pool.

Within one mile of the proposed AGI well there are 63 wells, of which, 22 are active and 20 are plugged (6 cancelled) (Figure A-2, Table 12). Additionally, there are 15 locations permitted that have not yet been drilled or completed including the Salt Creek AGI #1 (API: 30-025-46746).

**Table 12. Wells located within one mile of proposed Salt Creek AGI #2**

API	Well Name	Pool	Status	Latitude (NAD83)	Longitude (NAD83)	Total Depth (ft)	Miles from AGI
3002546746	Salt Creek AGI #001	Delaware	Permitted	32.0282	-103.2781	0	0.05
3002526718	Wilson 21 Federal #006Y	Comanche Stateline, Tan-Yates-7Riv-Qu	Plugged	32.031	-103.276	3750	0.21
3002526136	Wilson 21 Federal #006	No Data	Plugged	32.031	-103.275	1682	0.22
3002526134	Wilson 21 Federal #004	Comanche Stateline, Tan-Yates-7Riv-Qu	Active	32.026	-103.275	3575	0.24
3002526133	Wilson 21 Federal #003	Comanche Stateline, Tan-Yates-7Riv-Qu	Active	32.027	-103.273	3797	0.33
3002525957	Lea 20 #001	Capitan Reef	Plugged	32.024	-103.28	3420	0.34
3002526135	Wilson 21 Federal #005	Comanche Stateline, Tan-Yates-7Riv-Qu	Active	32.031	-103.272	3800	0.35
3002509858	Roy Smith #001	No Data	Plugged	32.027	-103.272	3940	0.36
3002526138	Wilson 21 Federal #008	Comanche Stateline, Tan-Yates-7Riv-Qu	Active	32.034	-103.275	3700	0.40
3002509856	Sand Hills Unit #006	No Data	Plugged	32.023	-103.281	1247	0.42
3002527197	Lea 20 7426 JV-S #002	Comanche Stateline, Tan-Yates-7Riv-Qu	Plugged	32.035	-103.28	3670	0.44
3002545837	Camellia Federal Com 26 36 21 #111H	Wolfcamp	Permitted	32.022	-103.278	0	0.45
3002545918	Camellia Federal Com 26 36 21 #101H	Wolfcamp	Permitted	32.022	-103.278	0	0.45
3002545897	Camellia Federal Com 26 36 21 #121H	Wolfcamp	Active	32.022	-103.278	11992	0.45
3002545982	Camellia Federal Com 26 36 21 #081H	Lower Bone Spring	Permitted	32.022	-103.278	0	0.45
3002545984	Camellia Federal Com 26 36 21 #091H	Lower Bone Spring	Permitted	32.022	-103.278	0	0.45
3002526132	Wilson 21 Federal #002	Comanche Stateline, Tan-Yates-7Riv-Qu	Active	32.022	-103.275	3500	0.46
3002509857	Sand Hills Unit #006A	No Data	Plugged	32.022	-103.281	3349	0.47

3002526137	Wilson 21 Federal #007	Comanche Stateline, Tan-Yates-7Riv-Qu	Active	32.034	-103.272	3700	0.50
3002544112	Wildhog BWX State Com #002H	Wolfcamp	Active	32.035	-103.282	12008	0.51
3002526131	Wilson 21 Federal #001	Comanche Stateline, Tan-Yates-7Riv-Qu	Active	32.022	-103.273	3340	0.52
3002544527	Camellia 26 36 16 State Com #101C	Wolfcamp	Cancelled	32.037	-103.277	0	0.54
3002544229	Azalea 26 36 28 State #121Y	Wolfcamp	Active	32.021	-103.278	12434	0.55
3002544104	Azalea 26 36 28 State #111H	Wolfcamp	Active	32.021	-103.278	11966	0.55
3002544105	Azalea 26 36 28 State #121	Wolfcamp	Permitted	32.021	-103.278	994	0.55
3002527028	Lea 21, 7406 JV-S #002	Comanche Stateline, Tan-Yates-7Riv-Qu	Active	32.031	-103.268	3658	0.59
3002527029	Lea 21, 7406 JV-S #003	Comanche Stateline, Tan-Yates-7Riv-Qu	Active	32.027	-103.268	3574	0.60
3002509847	Maralo SV 16 State #006	No Data	Plugged	32.038	-103.276	11492	0.62
3002526806	Maralo 16 State #006Y	Sioux, Tansill-Yates-Seven Rivers	Plugged	32.038	-103.276	3800	0.63
3002526816	Wilson 17 Federal #003	Sioux, Tansill-Yates-Seven Rivers	Plugged	32.038	-103.281	3700	0.64
3002526056	Lea 7406 JV-S #009	Yates	Plugged	32.02	-103.275	1406	0.64
3002544522	Wildhog Bwx State Com #003C	Wolfcamp	Cancelled	32.035	-103.286	0	0.65
3002526068	Lea 7406 JV-S #009Y	Comanche Stateline, Tan-Yates-7Riv-Qu	Plugged	32.02	-103.275	3270	0.65
3002549931	Azalea 26 36 28 State Com #104H	Wolfcamp	Permitted	32.021	-103.271	0	0.66
3002549932	Azalea 26 36 28 State Com #123H	Wolfcamp	Permitted	32.021	-103.271	0	0.66
3002527000	Lea 21, 7406 JV-S #001	Comanche Stateline, Tan-Yates-7Riv-Qu	Active	32.034	-103.268	3668	0.69
3002527030	Lea 21 7406 JV-S #004	Tan-Yates	Plugged	32.023	-103.268	1060	0.70
3002526751	Maralo 16 State #007	Sioux, Tansill-Yates-Seven Rivers	Plugged	32.038	-103.272	3800	0.70
3002545983	Camellia Federal Com 26 36 21 #083H	Lower Bone Spring	Permitted	32.02	-103.272	0	0.71
3002545985	Camellia Federal Com 26 36 21 #093H	Lower Bone Spring	Permitted	32.02	-103.272	0	0.71
3002545986	Camellia Federal Com 26 36 21 #104H	Wolfcamp	Permitted	32.02	-103.272	0	0.71
3002545987	Camellia Federal Com 26 36 21 #114H	Wolfcamp	Permitted	32.02	-103.272	0	0.71
3002545988	Camellia Federal Com 26 36 21 #124H	Wolfcamp	Permitted	32.02	-103.272	0	0.72
3002527207	Lea 21, 7406 JV-S #004Y	Comanche Stateline, Tan-Yates-7Riv-Qu	Active	32.024	-103.267	3550	0.72
3002525930	Lea 7406 JV-S #008	Comanche Stateline, Tan-Yates-7Riv-Qu	Plugged	32.019	-103.273	3270	0.73
3002549590	Azalea 26 36 28 State Com #125H	Wolfcamp	Permitted	32.021	-103.269	0	0.74
3002538885	Eagle Feather Federal #002	Pawnee, Strawn	Active	32.034	-103.267	13179	0.74
3002526847	Wilson 17 Federal #006	Yates	Cancelled	32.038	-103.285	0	0.75

3002542733	Wildhog BWX State Com #001H	Wolfcamp	Active	32.035	-103.289	12517	0.81
3002525920	Lea 7406 JV-S #007	Comanche Stateline, Tan-Yates-7Riv-Qu	Plugged	32.017	-103.278	3270	0.82
3002527041	Lea 21, 7406 JV-S #006	Comanche Stateline, Tan-Yates-7Riv-Qu	Active	32.031	-103.264	3495	0.84
3002527042	Lea 21, 7406 JV-S #007	Comanche Stateline, Tan-Yates-7Riv-Qu	Active	32.027	-103.264	3525	0.84
3002526805	Maralo 16 State #010	Sioux, Tansill-Yates-Seven Rivers	Active	32.038	-103.268	3800	0.85
3002526753	Maralo 16 State #009	Sioux, Tansill-Yates-Seven Rivers	Plugged	32.041	-103.276	3800	0.88
3002527106	Lea 10 7406 JV-S #001	Undesignated	Cancelled	32.041	-103.281	0	0.89
3002526815	Wilson 17 Federal #002	Sioux, Tansill-Yates-Seven Rivers	Plugged	32.041	-103.281	3700	0.89
3002549933	Azalea 26 36 28 State Com #127H	Wolfcamp	Permitted	32.021	-103.266	0	0.91
3002527031	Lea 21, 7406 JV-S #005	Comanche Stateline, Tan-Yates-7Riv-Qu	Active	32.034	-103.264	3660	0.91
3002527027	Wilson 17 Federal #009	Yates	Cancelled	32.038	-103.289	0	0.91
3002527043	Lea 21, 7406 JV-S #008	Comanche Stateline, Tan-Yates-7Riv-Qu	Active	32.023	-103.264	3570	0.92
3002526752	Maralo 16 State #008	Sioux, Tansill-Yates-Seven Rivers	Plugged	32.041	-103.272	3750	0.93
3002526846	Wilson 17 Federal #005	Yates	Cancelled	32.041	-103.285	0	0.97
3002525909	Lea 7406 JV-S #006	Comanche Stateline, Tan-Yates-7Riv-Qu	Plugged	32.015	-103.273	3250	0.98

There are four wells within two miles of the proposed AGI well that penetrate the anticipated injection interval (Table 13). All four wells have been plugged and are located more than one mile from the proposed AGI location. Although the wells penetrate the injection zone, each one was plugged back to shallower formations before being plugged and abandoned. The wells are properly cemented through the injection zone and are not anticipated to be negatively affected by the operation of Salt Creek AGI #2. All relevant plugging reports are included in Appendix A.

**Table 13. Wells located within two miles of Salt Creek AGI #2 that penetrate the proposed injection interval**

API	Well Name	Pool	Status	Latitude (NAD 83)	Longitude (NAD 83)	Total Depth (ft)	Mi. from AGI
3002523197	South Lea Federal #001	Strawn	Plugged	32.0415	-103.2892	21252	1.10
3002526557	Pawnee Deep Unit #001	Strawn, Bone Spring	Plugged	32.0315	-103.2541	18577	1.40
3002525354	Horse Back #001	Bone Spring	Plugged	32.0031	-103.2679	21750	1.87
3002524719	Dogie Draw Federal #001	Bone Spring	Plugged	32.0560	-103.2850	20971	1.92

## **6.0 IDENTIFICATION AND REQUIRED NOTIFICATION OF OPERATORS, SUBSURFACE LESSEES, AND SURFACE OWNERS WITHIN THE AREA OF REVIEW**

In developing this C-108 application, a detailed review of land records was completed to obtain a listing of all operators, oil and gas mineral leases, and surface owners within a one-mile radius of the proposed AGI well. Appendix B includes the results from that research.

Table B-1 summarizes the surface owners, operators, and lessees in the one-mile area of review. The table is inclusive of all persons that were provided notice and a complete copy of the C-108 application. Figure B-1 shows the location of the surface owners and active operators, and Figure B-2 shows all leaseholders within one mile of the proposed AGI well location.

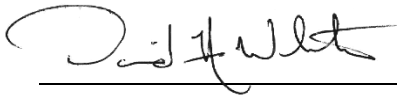
Appendix B also includes a sample notice letter text that will be provided to the required parties. Individual notices will be sent and copies of the individual notice letters, certified mail receipts, and a copy of the newspaper notice and affidavit of publication, will be provided to the Commission after the receipt of a Case Number and a date for the hearing.

**7.0 AFFIRMATIVE STATEMENT OF LACK OF HYDRAULIC CONNECTION BETWEEN THE PROPOSED INJECTION ZONE AND KNOWN SOURCES OF DRINKING WATER**

As part of the work performed to support this application, a detailed investigation of the structure, stratigraphy, and hydrogeology of the area surrounding the proposed Northwind Midstream well has been performed. The investigation included the analysis of available geologic data and hydrogeologic data from wells and literature identified in Section 3.0, 4.0, and 5.0 above, including related appendices. Based on this investigation and the analysis of these data, it is clear that there are no open fractures, faults, or other structures which could potentially result in the communication of fluids between the proposed injection zone and any known sources of drinking water or oil/gas production in the vicinity, as described above in Sections 4.0 and 5.0 of this application.

I have reviewed this information and affirm that it is correct to the best of my knowledge.

David A. White, P.G.  
Vice President – Geolex, Inc.®  
Consultant to Northwind Midstream, LLC



Date: 10/10/2023



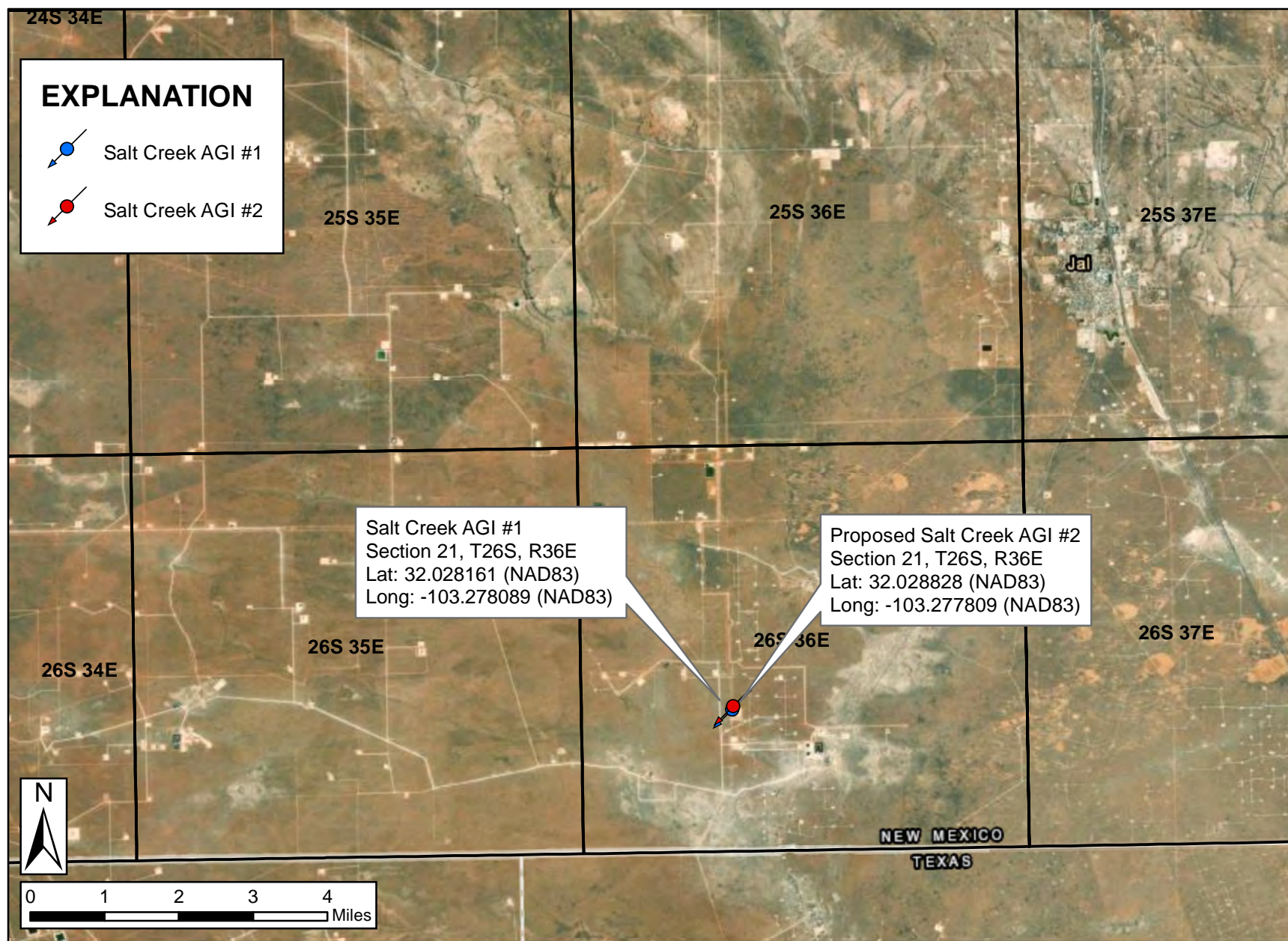


Figure 1. General location map for proposed Salt Creek AGI #2 in Section 21 (T26S R36E) located approximately 7.5 miles southwest of Jal, New Mexico.

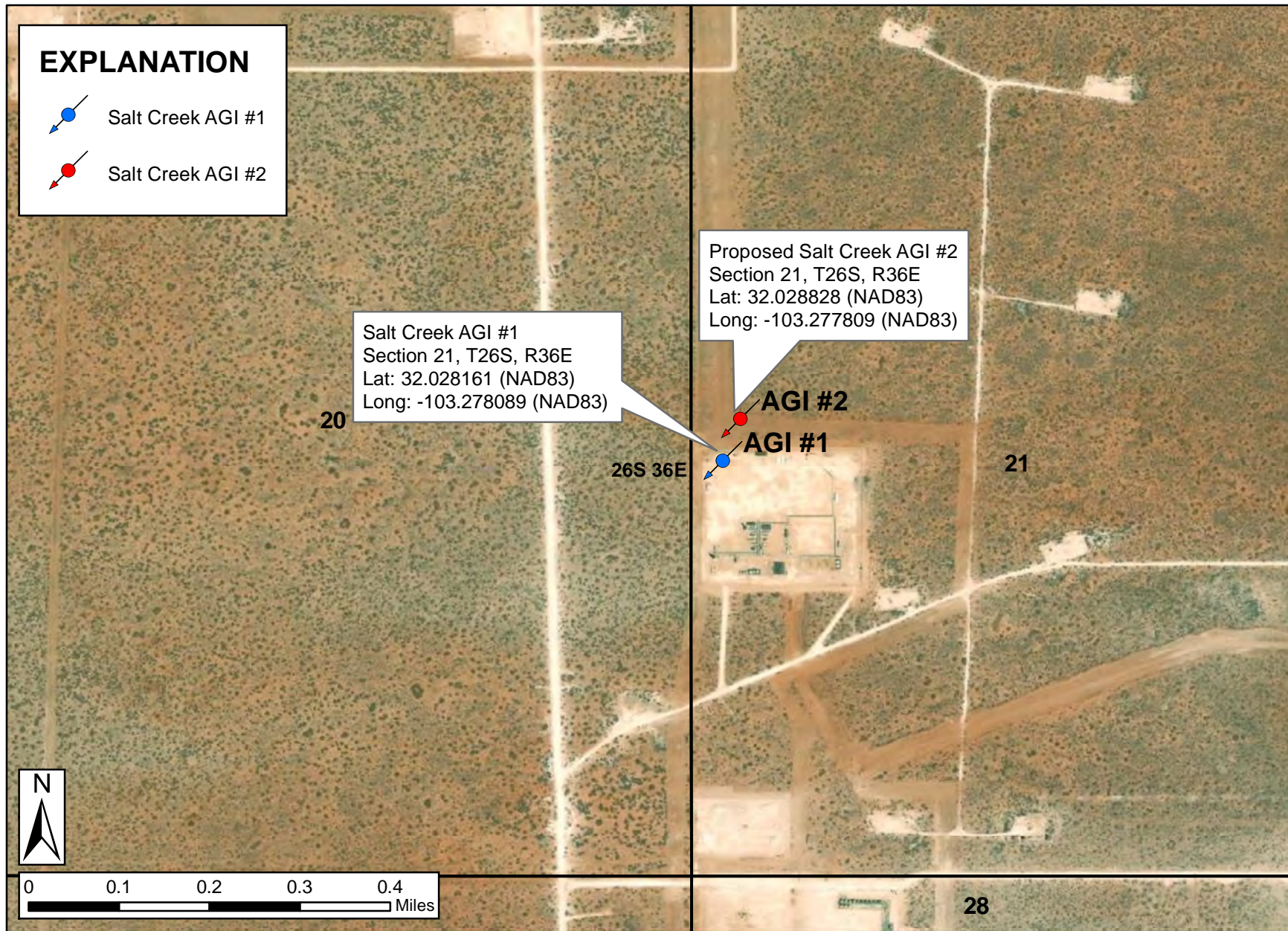


Figure 2. Detailed location map showing the anticipated Salt Creek AGI #1 and the proposed Salt Creek AGI #2 at the Section 21 Northwind Midstream gas-processing facility.

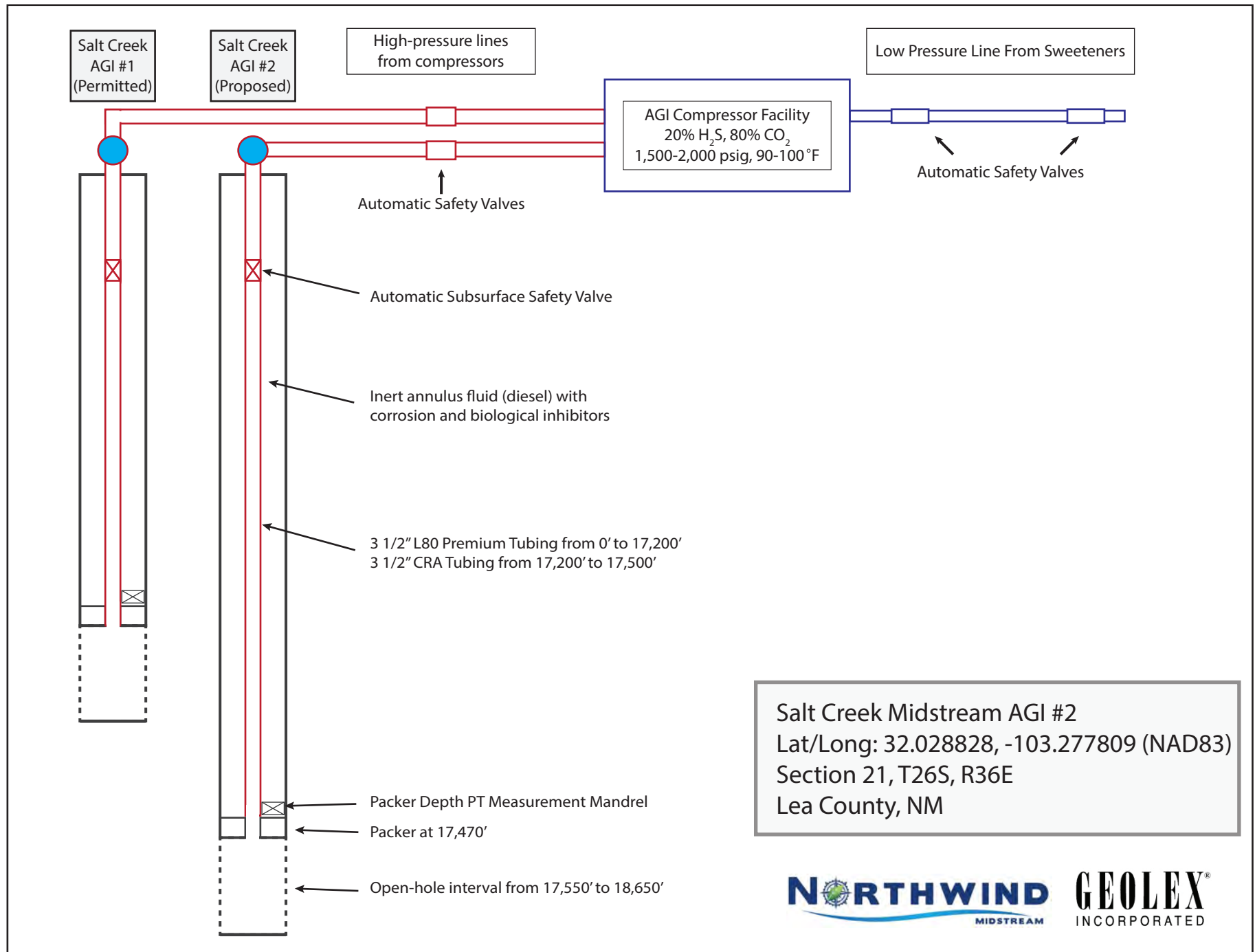


Figure 3. Schematic of surface facilities and proposed Salt Creek AGI #2.



# WELL SCHEMATIC SALT CREEK AGI #2 S21 - T26S - R36E

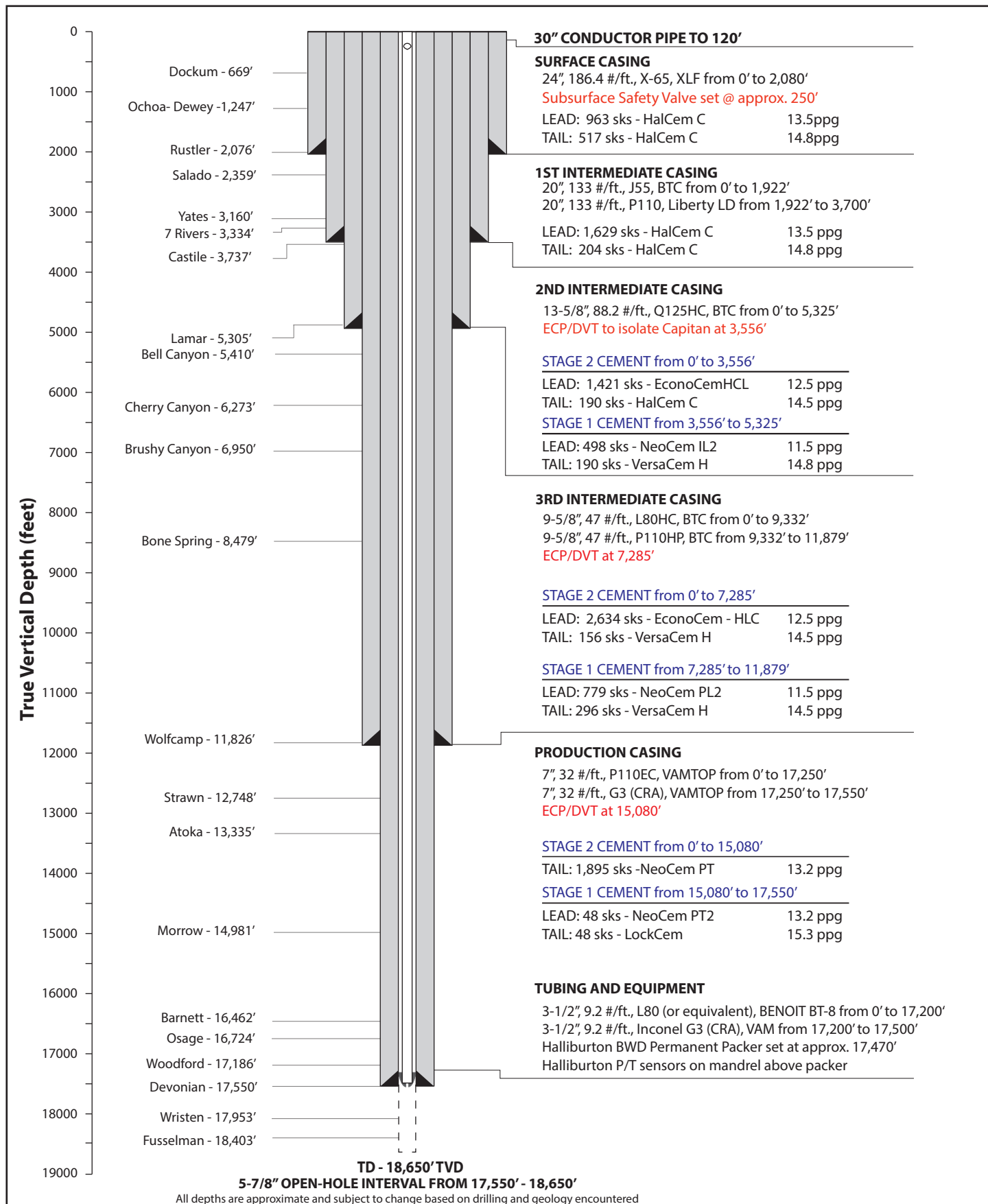
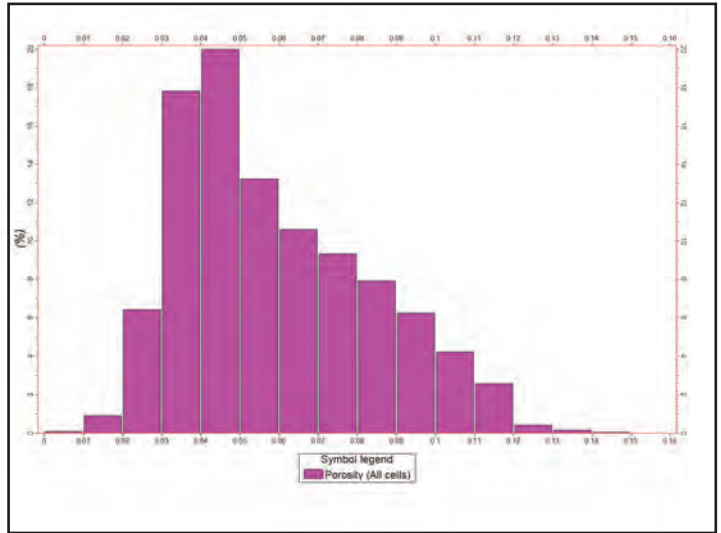
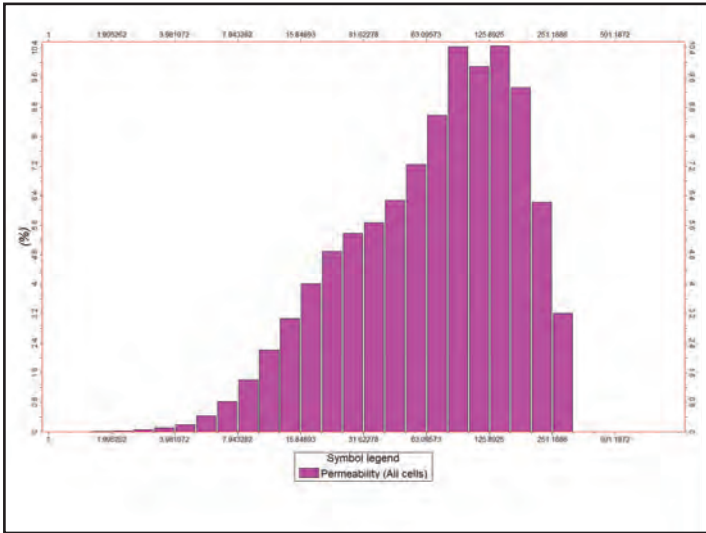


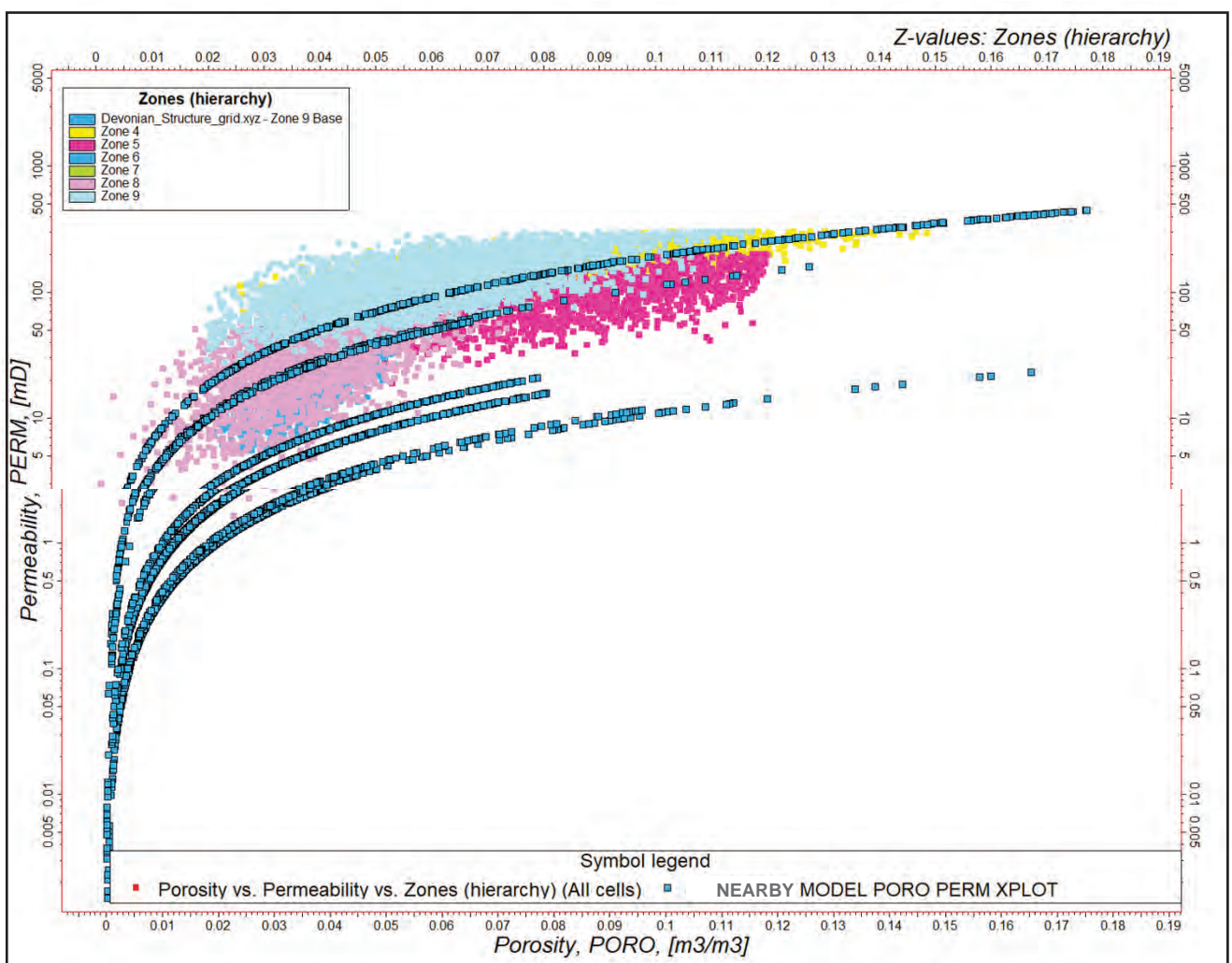
Figure 4. Well design consisting of a surface string of casing, three intermediate strings, and a production string with associating tubing/equipment and cement types.

# MODEL SIMULATION GRID CHARACTERISTICS



Permeability Distribution

Porosity Distribution



Permeability vs. Porosity

Figure 5. Geologic model porosity and permeability distribution generated from available wells

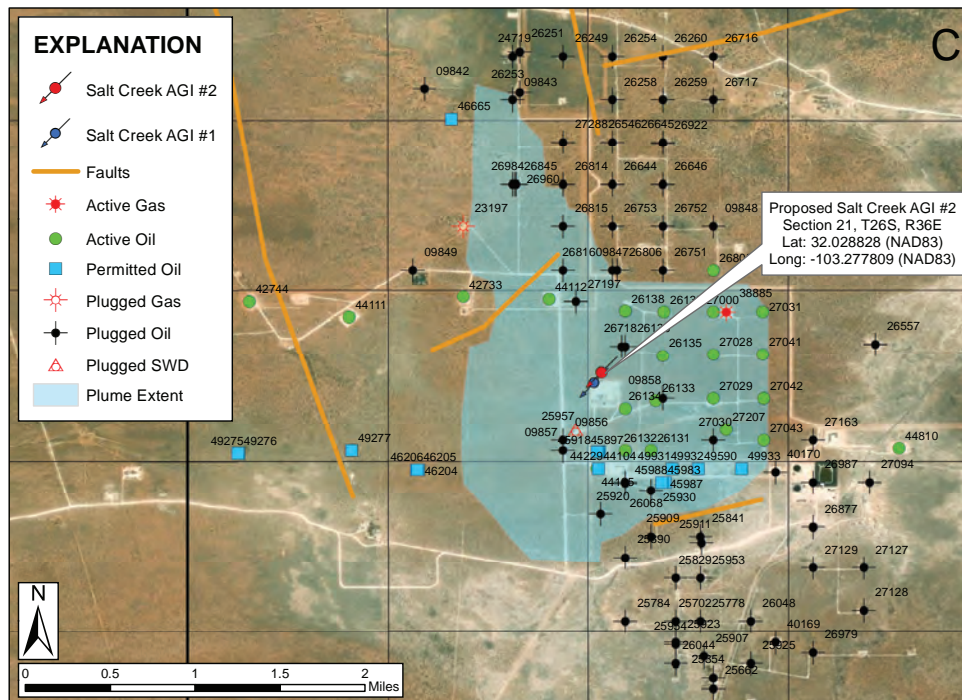
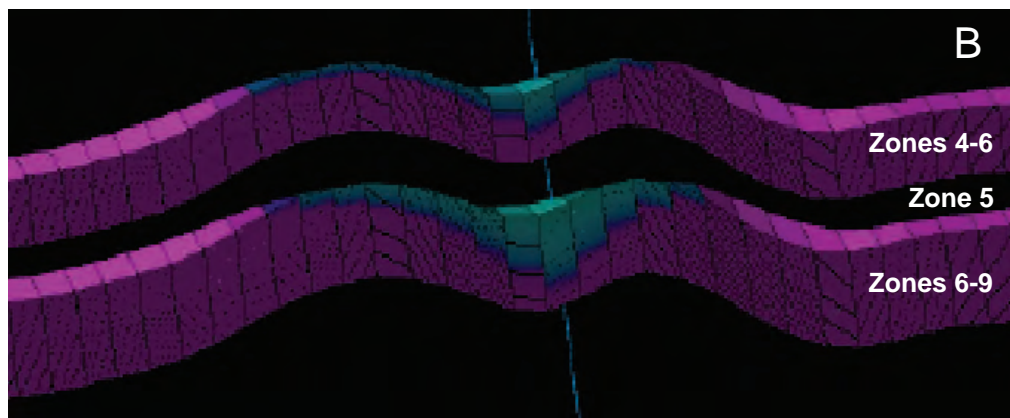
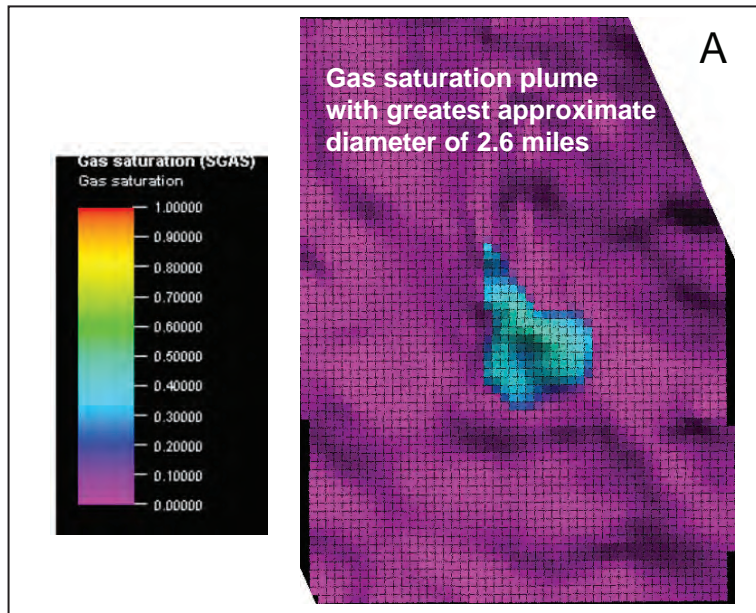


Figure 6. Summary of ECLIPSE injection simulation results. Panel A displays a map of gas saturation with the greatest diameter of approximately 2.6 miles. Panel B illustrates the cross-sectional view of the resultant injection plume. Panel C shows the approximate plume footprint.

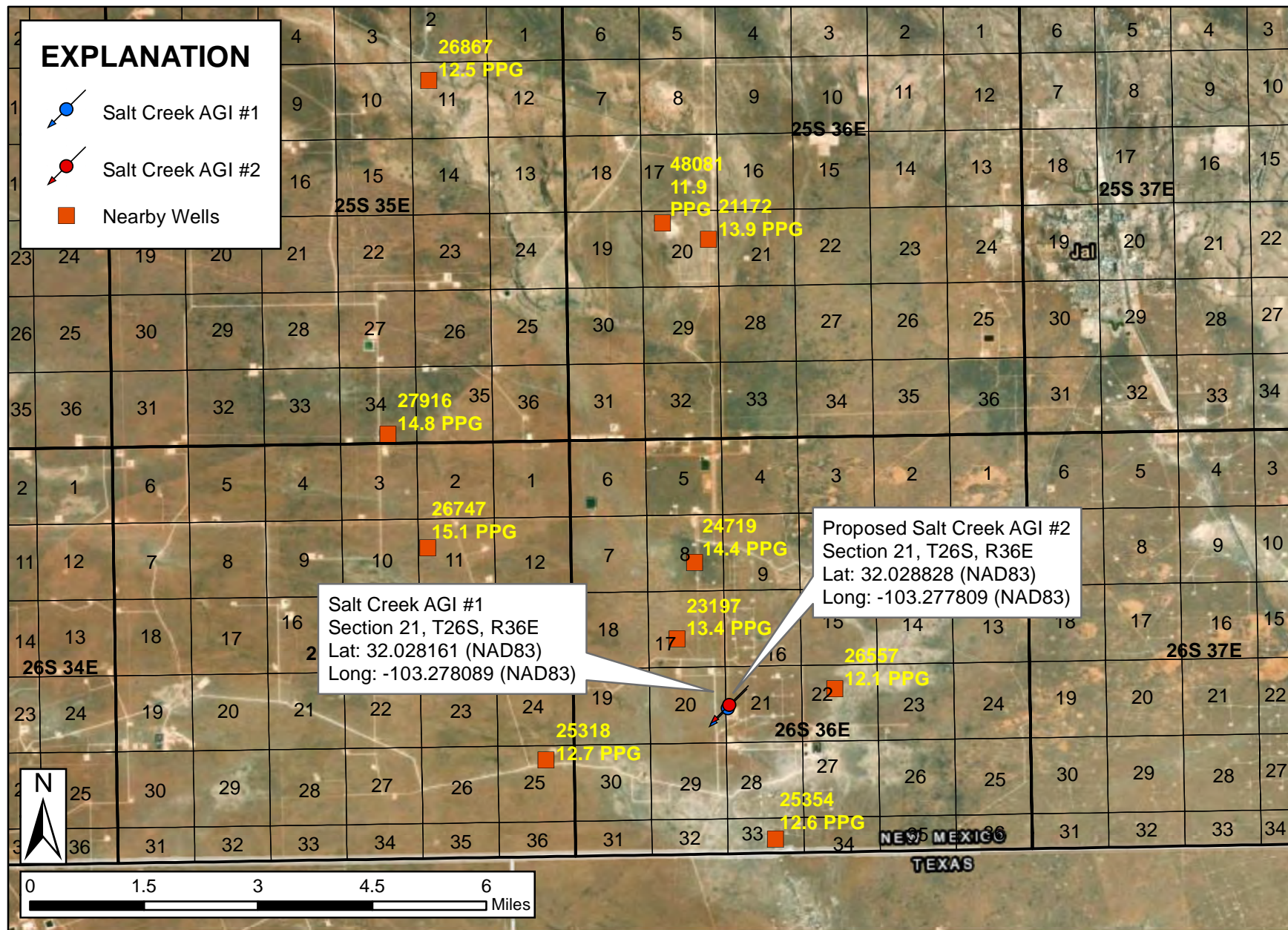


Figure 7. Location map summarizing drilling fluid weights utilized while drilling through overlying productive intervals and strata directly above the proposed injection zone. Labels denote last five digits of API #30-025-XXXXX.

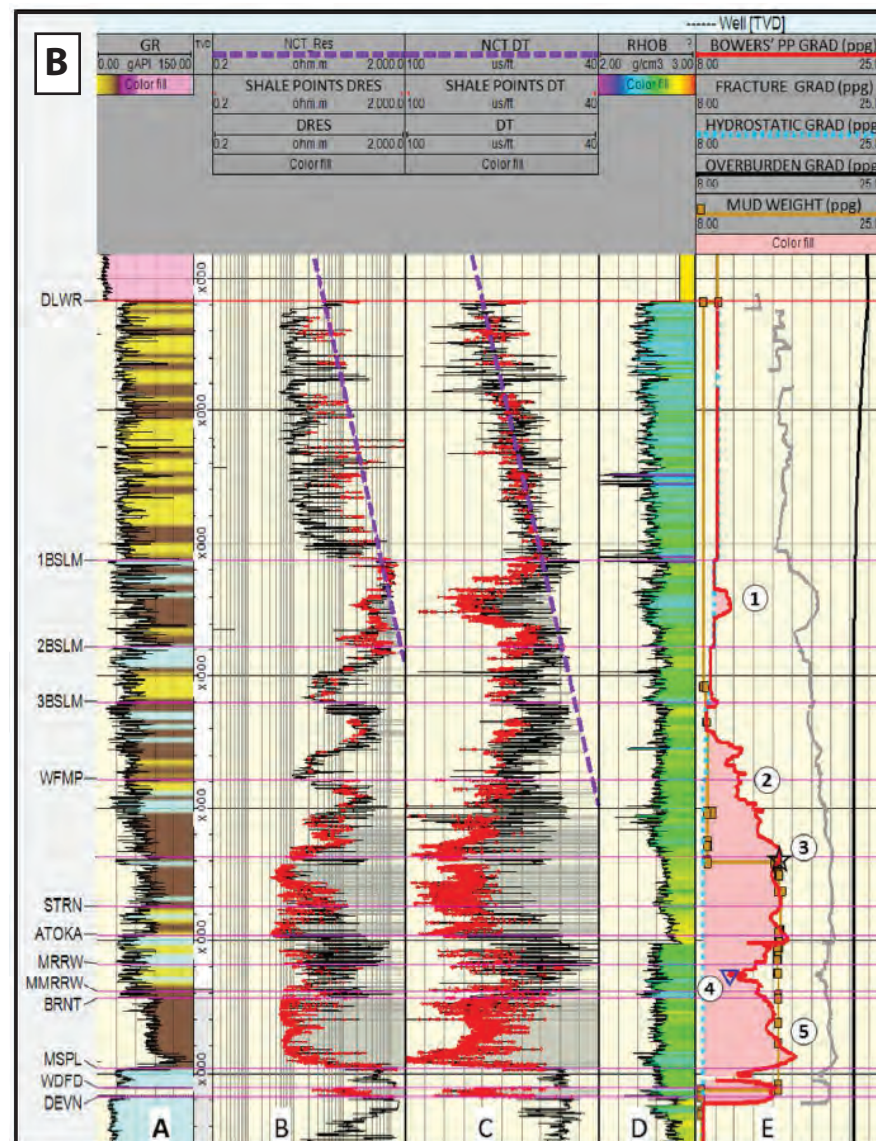
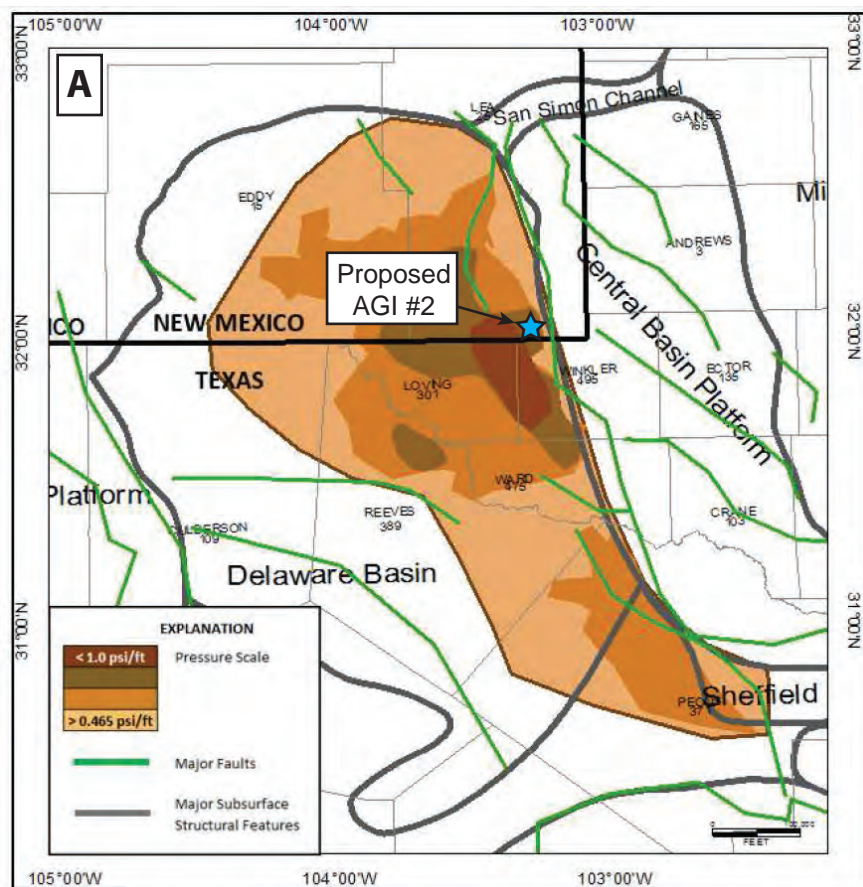


Figure 8. Mapped extent of present day overpressure in the Delaware Basin (Panel A) and example log response (Panel B) illustrating stratigraphic onset of over-pressured intervals and associated drilling fluid densities (modified from Rittenhouse et al., 2016)



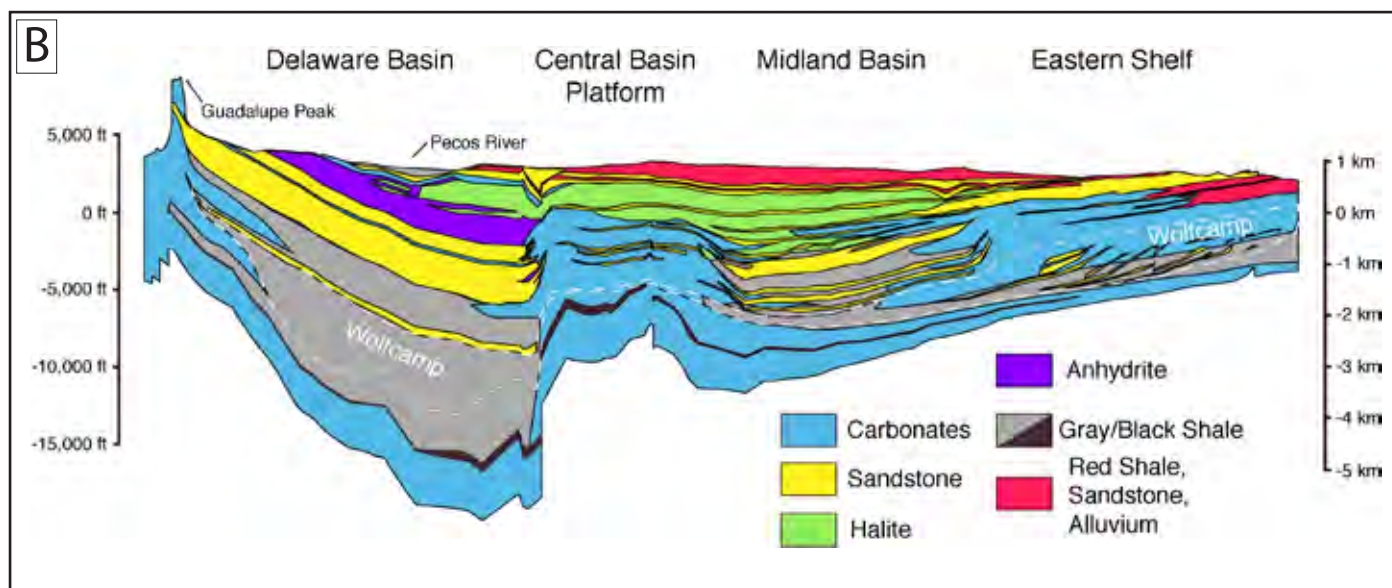
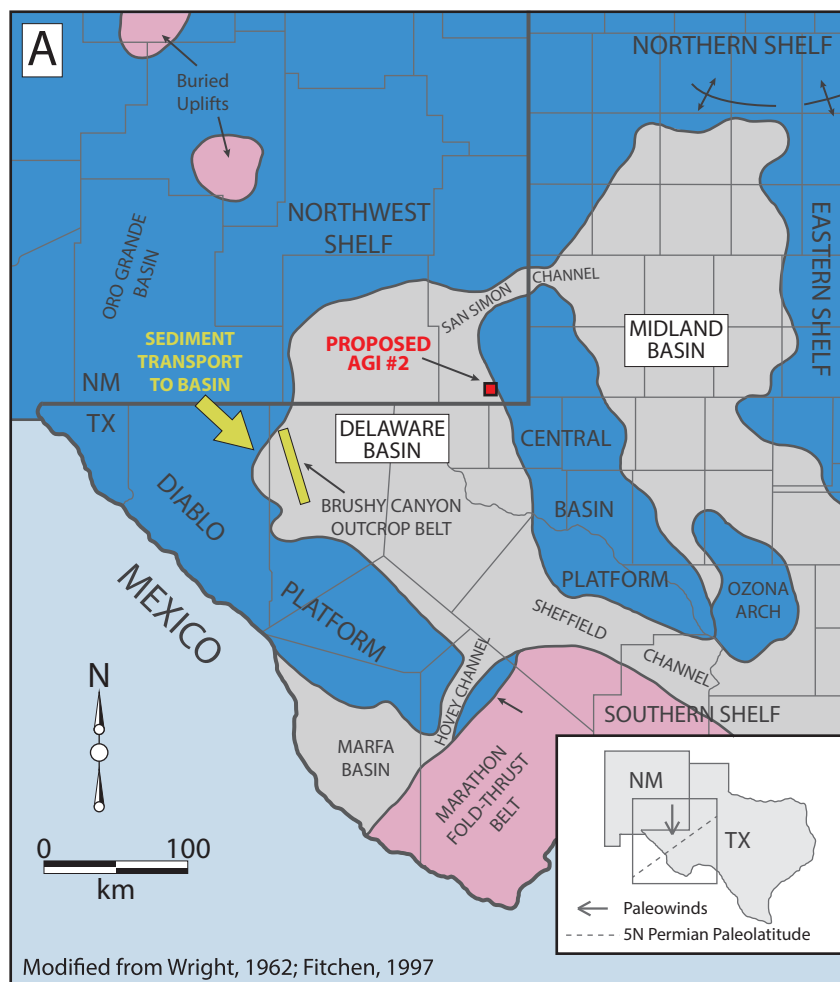


Figure 9. Structural setting (panel A) and general lithologies (panel B) of the Permian Basin.



## Generalized stratigraphic correlation chart for the Permian Basin region

SYSTEM	SERIES/STAGE	NORTHWEST SHELF	CENTRAL BASIN PLATFORM	MIDLAND BASIN & EASTERN SHELF	DELAWARE BASIN	VAL VERDE BASIN
PERMIAN	OCHOAN	DEWEY LAKE RUSTLER SALADO	DEWEY LAKE RUSTLER SALADO	DEWEY LAKE RUSTLER SALADO	DEWEY LAKE RUSTLER SALADO CASTILE	RUSTLER SALADO
	GUADALUPIAN	TANSILL YATES SEVEN RIVERS QUEEN GRAYBURG SAN ANDRES GLORIETA	TANSILL YATES SEVEN RIVERS QUEEN GRAYBURG SAN ANDRES GLORIETA	TANSILL YATES SEVEN RIVERS QUEEN GRAYBURG SAN ANDRES SAN ANGELO	DELAWARE MT. GROUP BELL CANYON CHERRY CANYON BRUSHY CANYON	TANSILL YATES SEVEN RIVERS QUEEN GRAYBURG SAN ANDRES
	LEONARDIAN	CLEARFORK YESO WICHITA ABO	CLEARFORK WICHITA	LEONARD SPRABERRY, DEAN	★ BONE SPRING	LEONARD
	WOLFCAMPIAN	WOLFCAMP	WOLFCAMP	WOLFCAMP	★ WOLFCAMP	WOLFCAMP
PENNSYLVANIAN	VIRGILIAN	CISCO	CISCO	CISCO	CISCO	CISCO
	MISSOURIAN	CANYON	CANYON	CANYON	CANYON	CANYON
	DESMOINESIAN	STRAWN	STRAWN	STRAWN	★ STRAWN	STRAWN
	ATOKAN	ATOKA	ATOKA	ATOKA	★ ATOKA	(ABSENT)
	MORROWAN	MORROW	(ABSENT)	(ABSENT ?)	★ MORROW	(ABSENT)
MISSISSIPPIAN	CHESTERIAN MERAMECIAN OSAGEAN KINDERHOOKIAN	CHESTER MERAMEC OSAGE KINDERHOOK	CHESTER MERAMEC OSAGE "BARNETT"	CHESTER MERAMEC OSAGE "BARNETT"	CHESTER MERAMEC OSAGE "BARNETT"	MERAMEC OSAGE "BARNETT"
	DEVONIAN	WOODFORD DEVONIAN	KINDERHOOK WOODFORD DEVONIAN	KINDERHOOK WOODFORD DEVONIAN	KINDERHOOK WOODFORD DEVONIAN	KINDERHOOK WOODFORD DEVONIAN
SILURIAN	(UNDIFFERENTIATED)	SILURIAN SHALE FUSSELMAN	SILURIAN SHALE FUSSELMAN	MIDDLE SILURIAN ★ FUSSELMAN	MIDDLE SILURIAN FUSSELMAN	
ORDOVICIAN	UPPER	MONTOYA	MONTOYA	SYLVAN MONTOYA	SYLVAN MONTOYA	SYLVAN MONTOYA
	MIDDLE	SIMPSON	SIMPSON	SIMPSON	SIMPSON	SIMPSON
	LOWER	ELLENBURGER	ELLENBURGER	ELLENBURGER	★ ELLENBURGER	ELLENBURGER
CAMBRIAN	UPPER	CAMBRIAN	CAMBRIAN	CAMBRIAN	CAMBRIAN	
PRECAMBRIAN						

Figure 10. General stratigraphy and producing zones (red stars) in the immediate area of Salt Creek AGI #2. Source: Yang and Dorobek (1995).

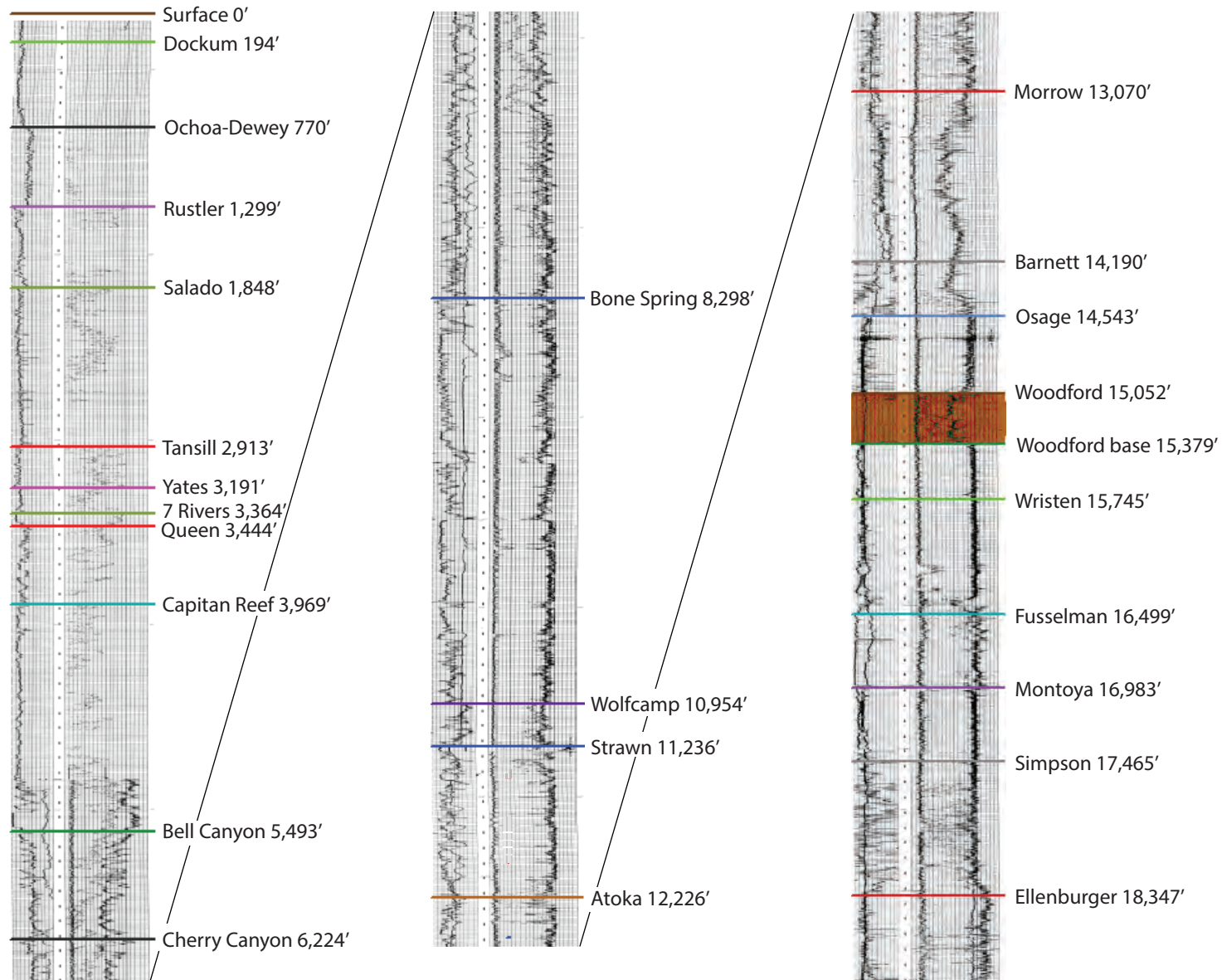


Figure 11. Type log of nearby well, West Jal B Deep #1 (API: 30-025-25046), illustrating identified formation tops in TVD. Estimated formation tops for the proposed Salt Creek AGI #2 are included in Table 4.

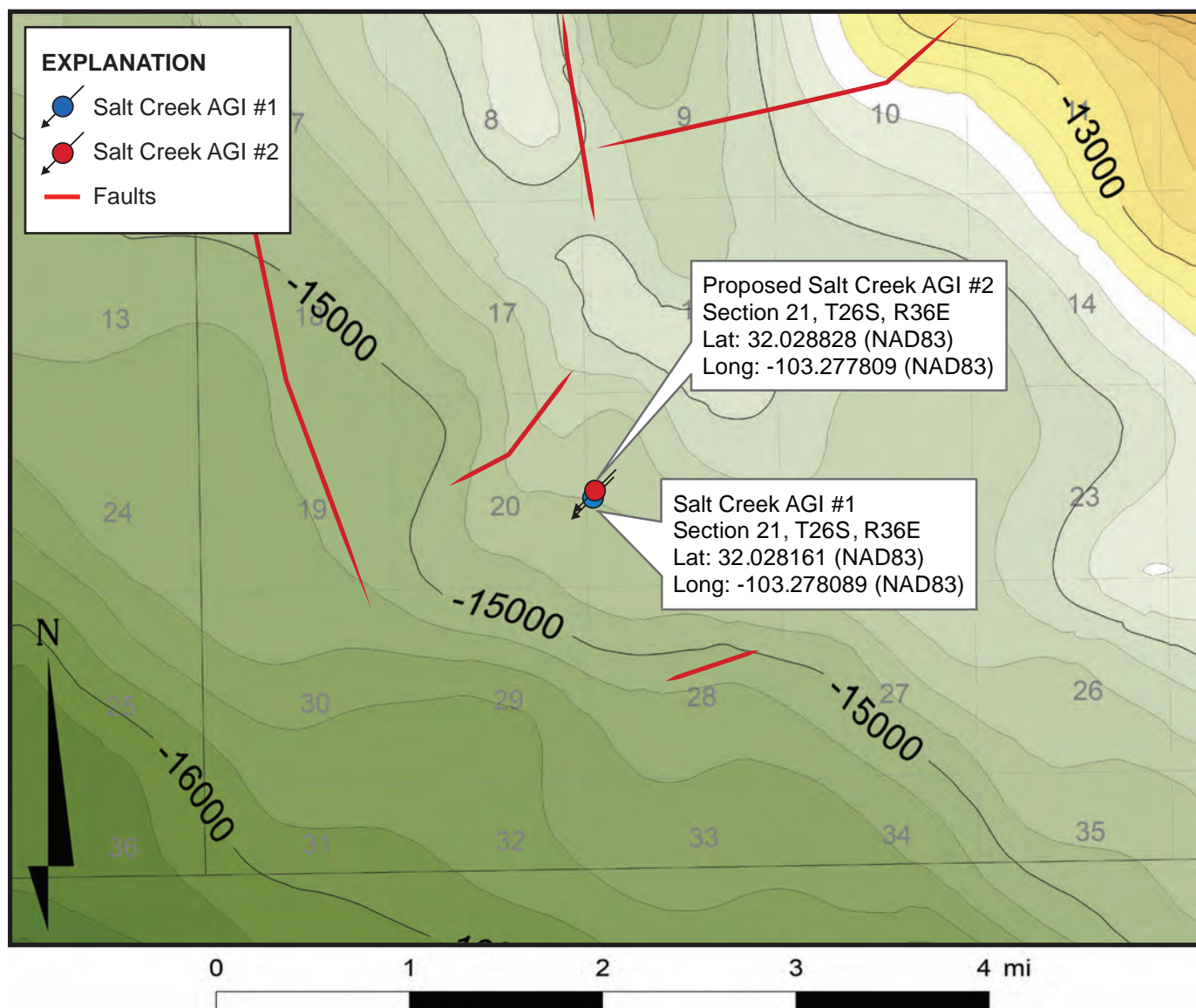


Figure 12. Structure contour map showing subsea elevation of the top of the Siluro-Devonian injection interval for the proposed Salt Creek AGI #2.

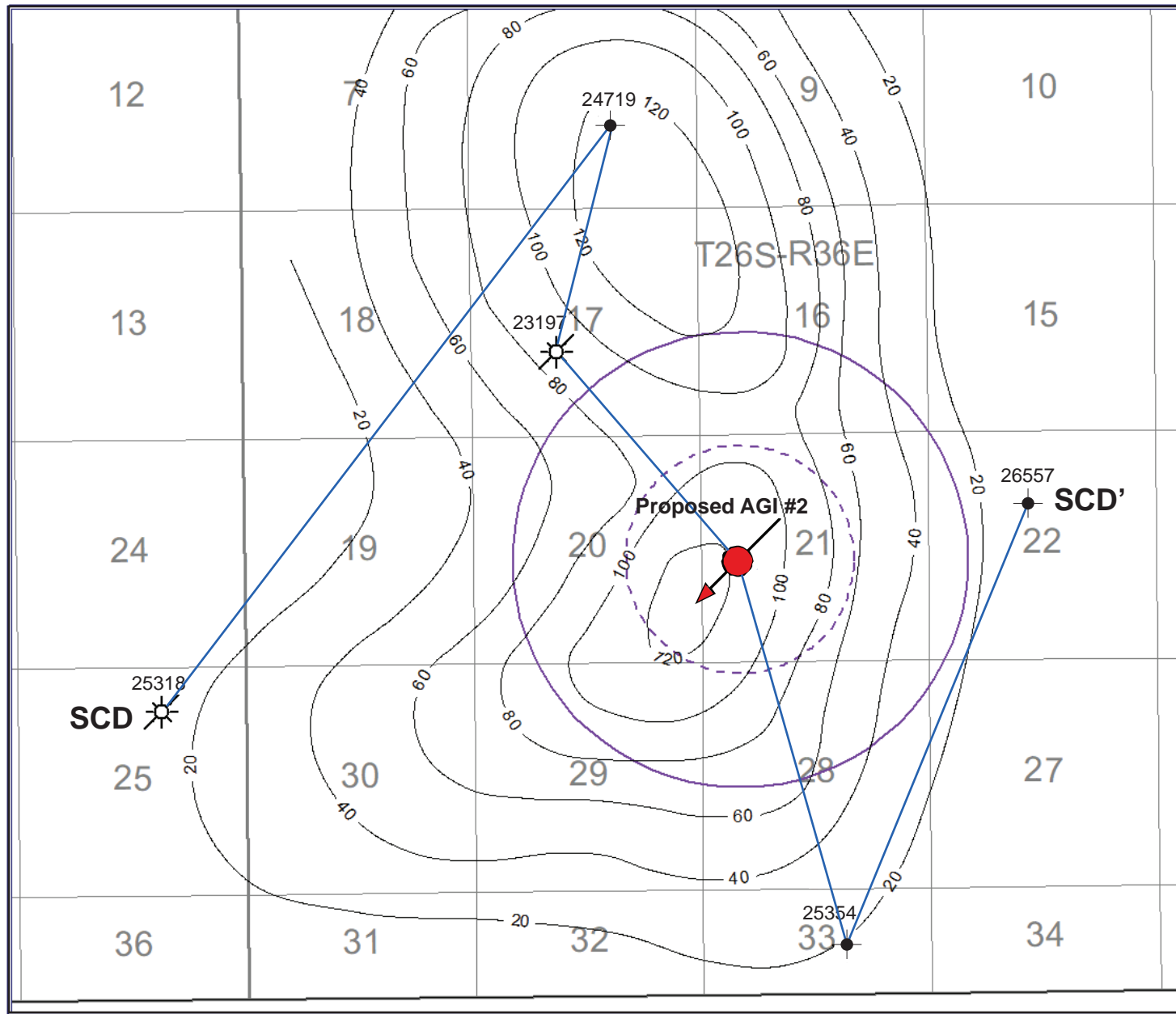


Figure 13. Isopach map showing observed thickness and estimated extent of the lower Devonian within the injection interval from nearby well data. The estimated range of porosity in this zone is from 2% to 12% with an average of 9%. Labels denote the last five digits of API #30-025-XXXXX. The circles shown are one-half mile radius (dashed) and one-mile radius (solid) around the proposed AGI #2.

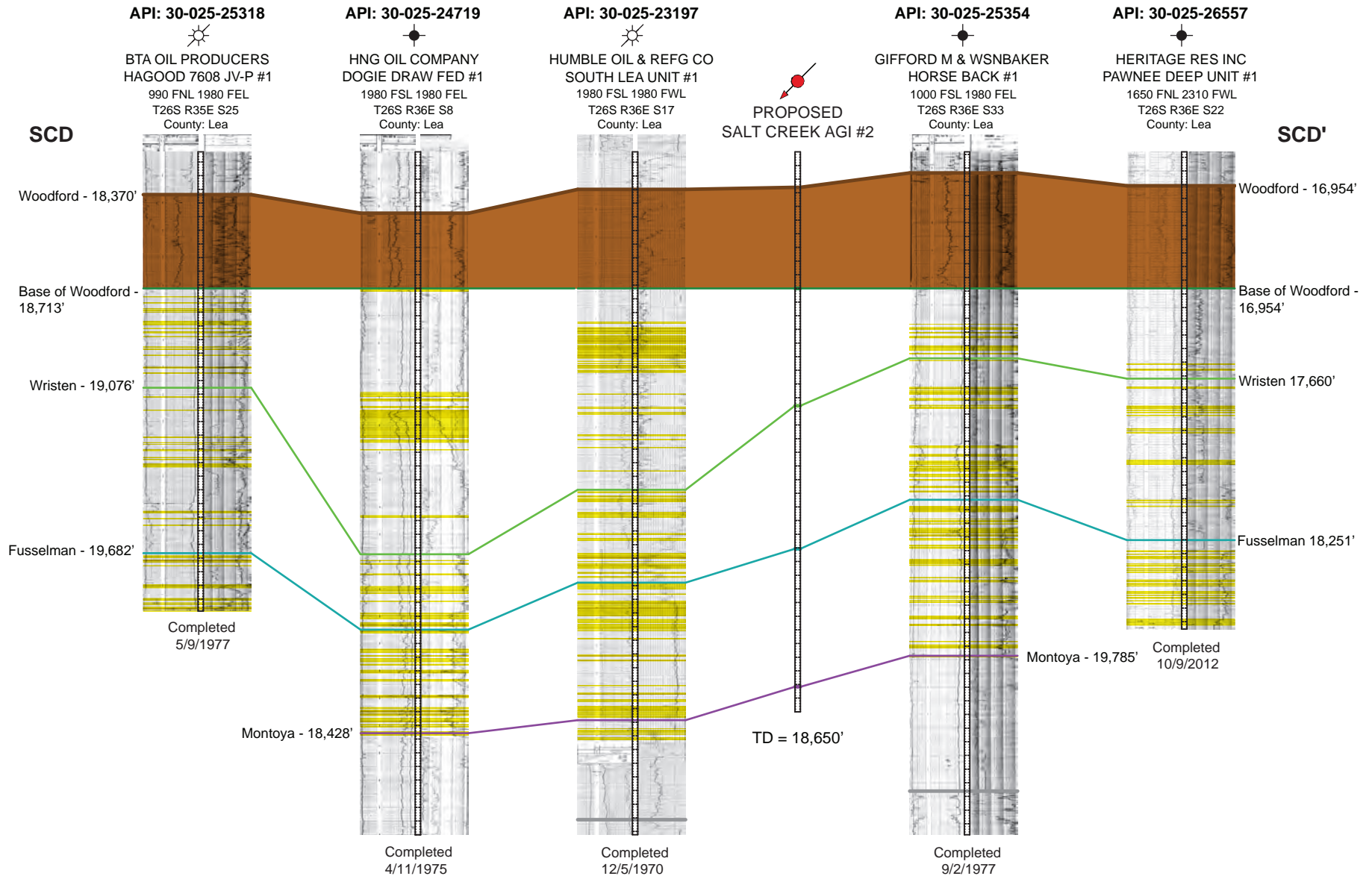


Figure 14. Cross section SCD-SCD' showing porosity profile within the proposed injection interval. Primary and fracture porosity is highlighted in yellow.

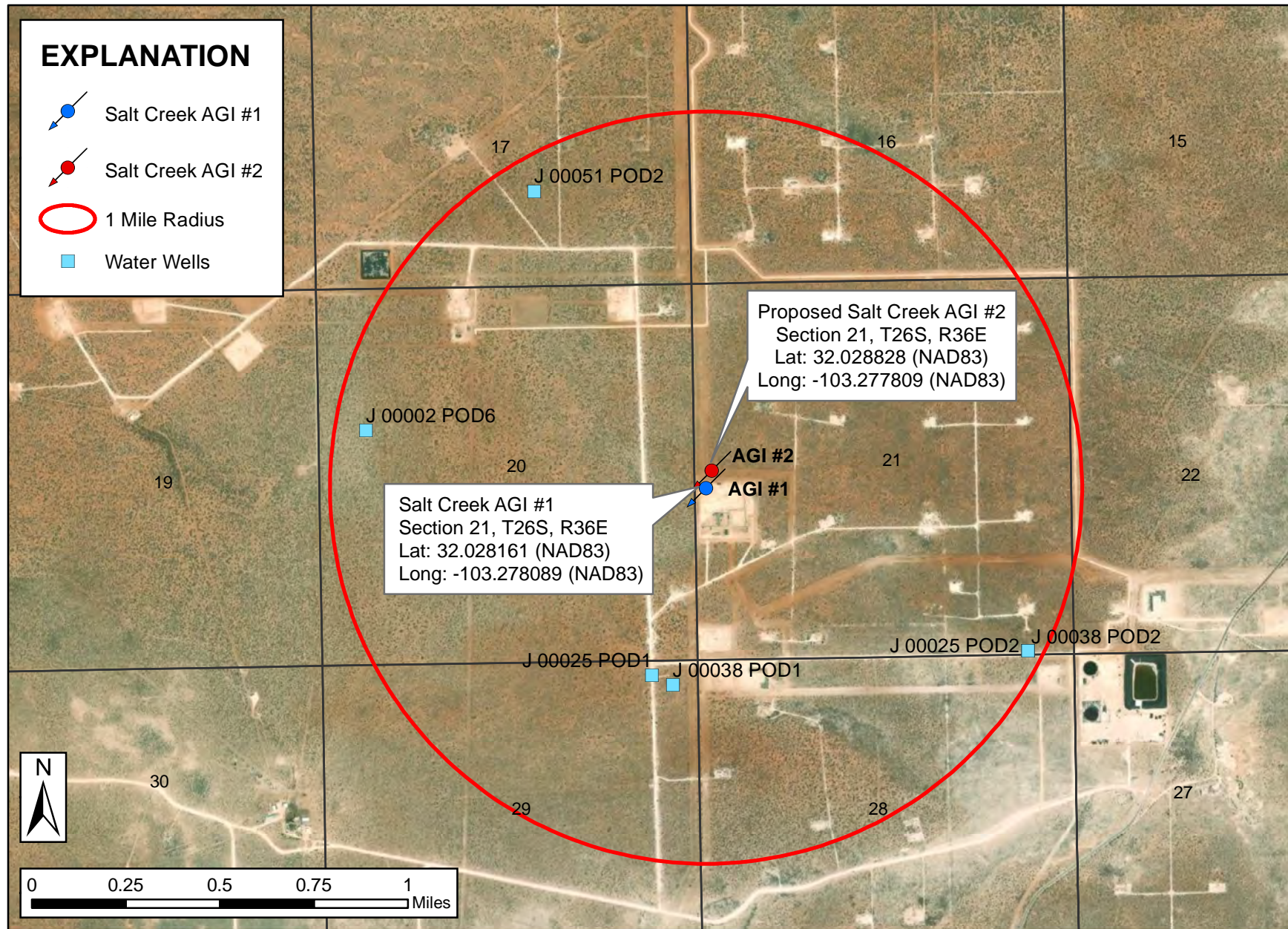


Figure 15. Water wells within one mile of the proposed Salt Creek AGI #2 location.

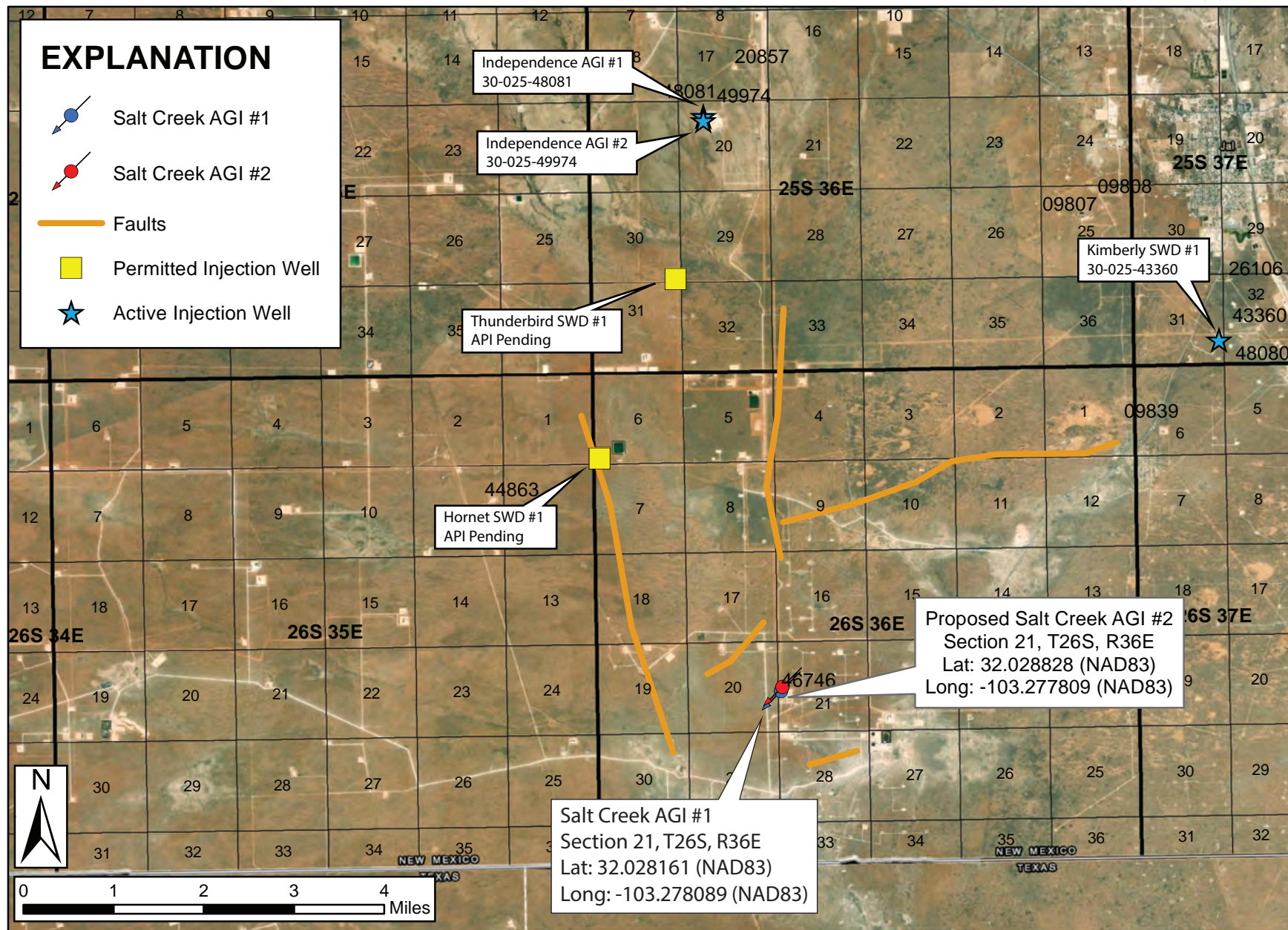
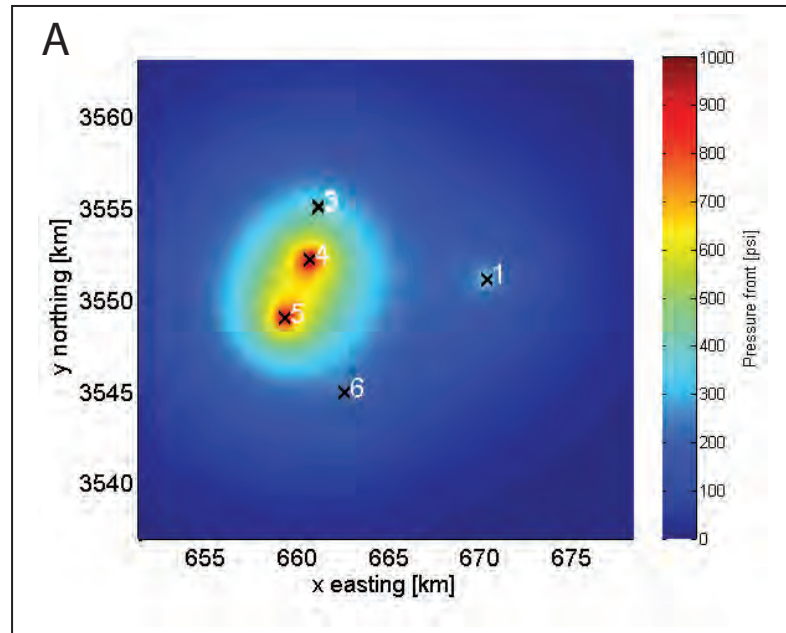
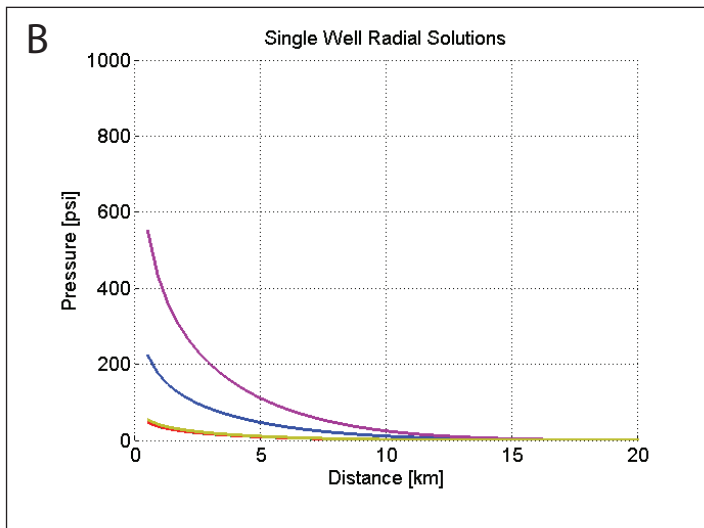


Figure 16. Deep injection wells and subsurface fault features in the vicinity of the proposed Salt Creek AGI #2. Labels denote last five digits of API #30-025-XXXXX.

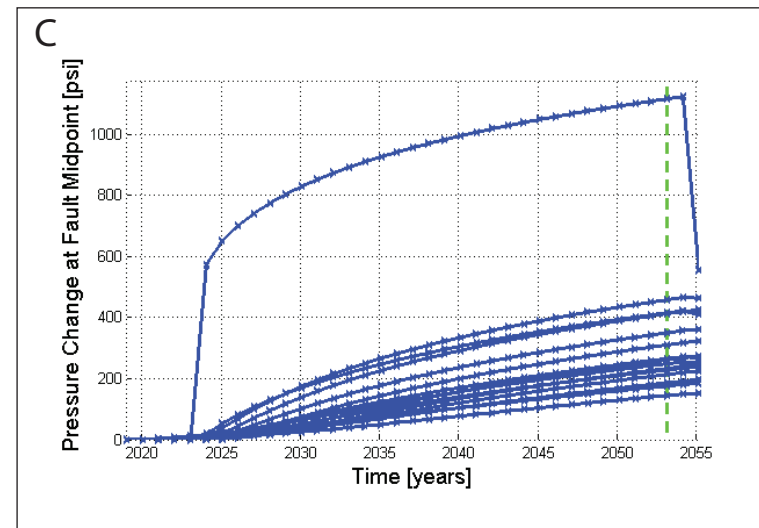




**Panel A.** The proposed AGI is well #4 and appears to have minimal impact on resultant on reservoir pressure conditions after the 30-year injection simulation with all other nearby AGI wells operating at maximum daily volume.



**Panel B.** Single well radial pressure solutions in the year 2053 as determined by the fault-slip potential model.



**Panel C.** Model-predicted pressure change through time at the midpoint of each fault segment included in the simulation.

Figure 17. Summary of model-predicted pressure front effects in the year 2053 from injection wells near the proposed AGI well that are operating within the Siluro-Devonian formations.

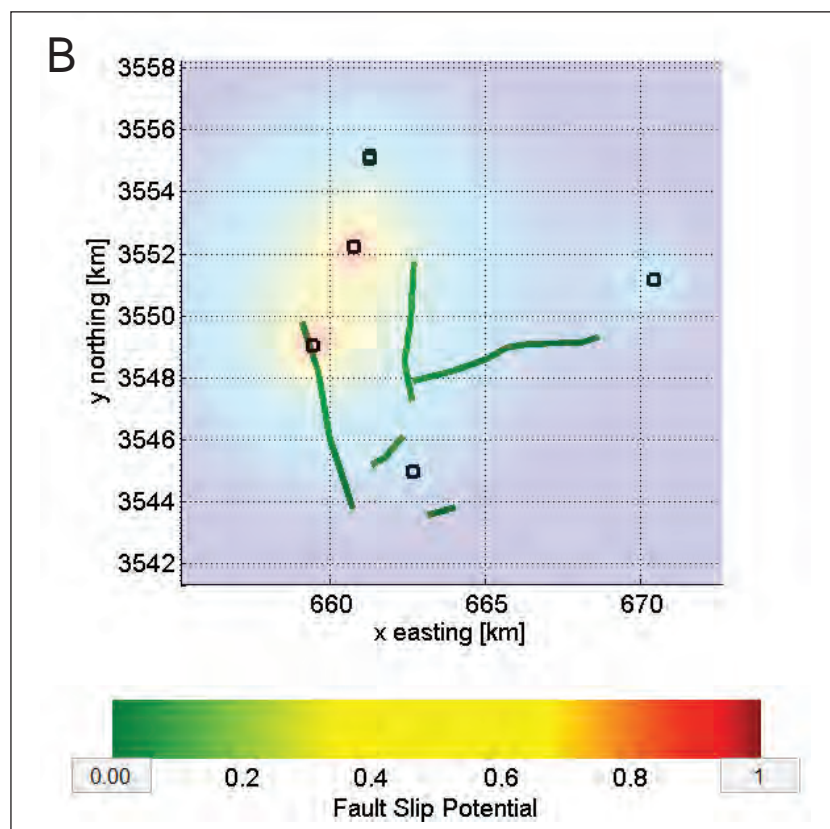
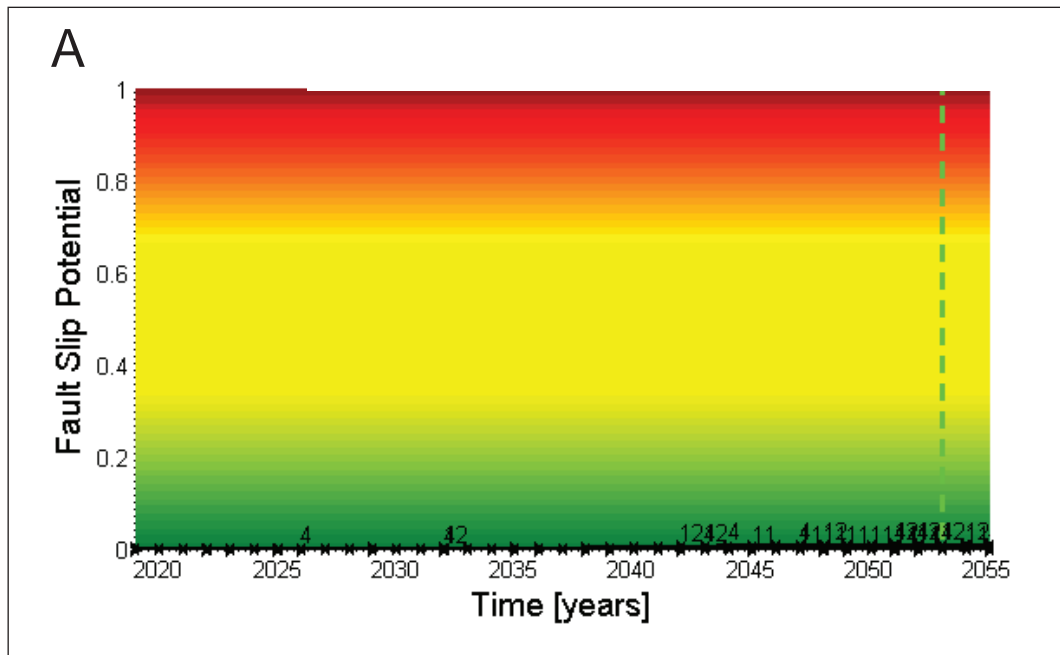


Figure 18. Model-predicted fault-slip potential after 30 years (Panel A) of injection operations at maximum daily volume conditions. Injection operations will have little impact on the faults in the area and indicate no risk of increasing the likelihood of induced seismicity in the region of the proposed AGI well (Panel B).

## **APPENDIX A**

### **INFORMATION ON OIL AND GAS WELLS WITHIN TWO MILES AND ONE MILE OF THE PROPOSED SALT CREEK AGI #2 AND PLUGGING DATA FOR PLUGGED WELLS WITHIN ONE MILE OF THE PROPOSED AGI**

Figure A-1:	All wells located within two miles of the proposed Salt Creek AGI #2
Figure A-2:	All wells located within one mile of the proposed Salt Creek AGI #2
Table A-1:	Wells located within two miles of the proposed Salt Creek AGI #2
Table A-2:	Wells located within one mile of the proposed Salt Creek AGI #2
Attachment A-1:	Available NMOCD plugging documents for wells penetrating the injection zone within two miles of the proposed Salt Creek AGI #2

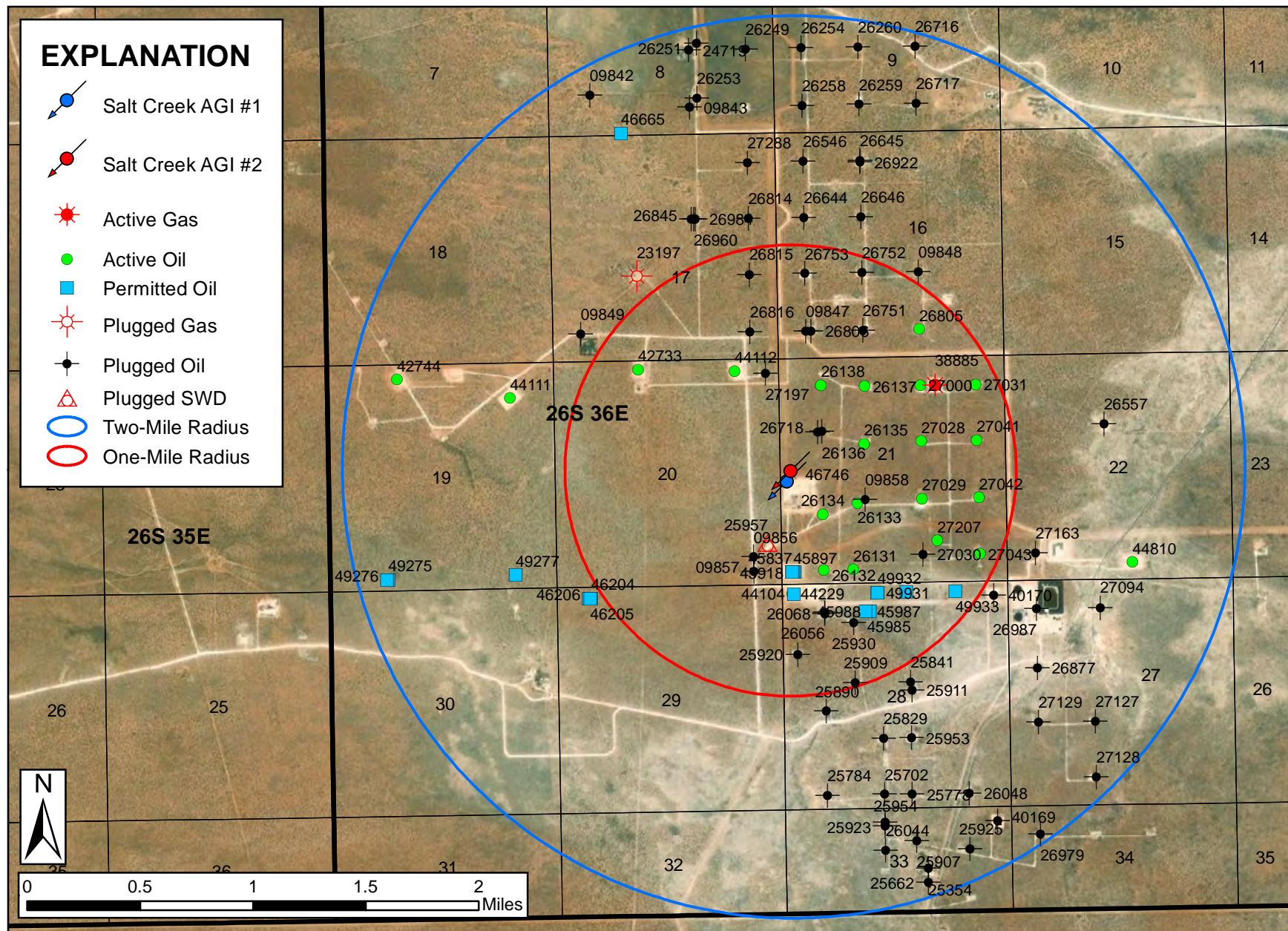


Figure A-1. All wells located within two miles of the proposed Salt Creek AGI well. Labels denote last five digits of API #30-025-XXXXX.

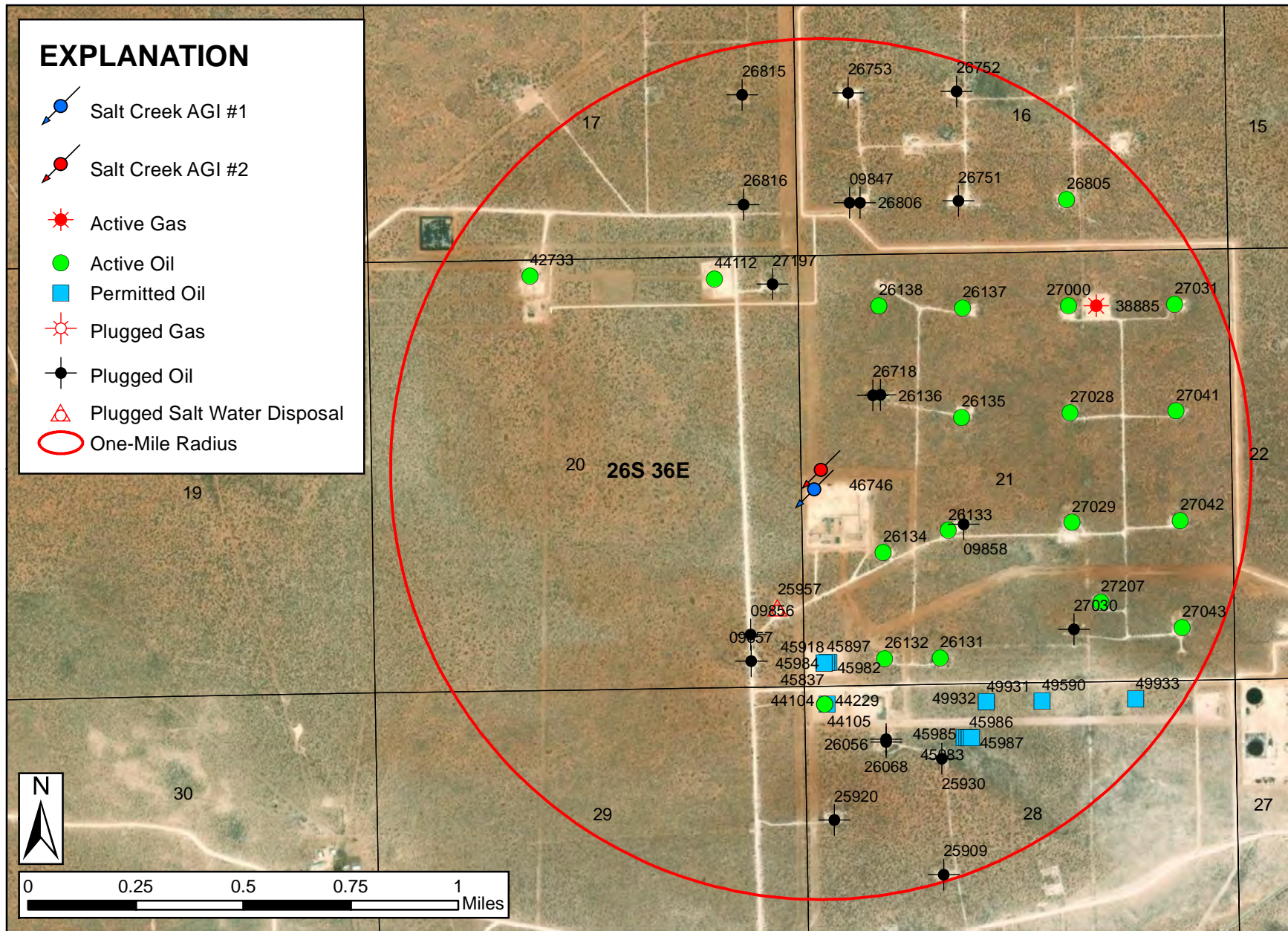


Figure A-2. All wells located within one mile of the proposed Salt Creek AGI #2. Labels denote last five digits of API #30-025-XXXXX.

**TABLE A-1. WELLS LOCATED WITHIN TWO MILES OF THE PROPOSED SALT CREEK AGI #2**

API	Well Name	Operator	Well Type	Status	Lat. (NAD83)	Long. (NAD83)	Pool	Spud Year	Plug Year	Total Depth (ft)	Miles from AGI
3002546746	Salt Creek AGI #001	Salt Creek Midstream, LLC	AGI	New	32.02816	-103.278	Delaware	-	-	0	0.05
3002526718	Wilson 21 Federal Well #006Y	Enron Oil & Gas Company	Oil	Plugged	32.0313	-103.276	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3750	0.21
3002526136	Wilson 21 Federal #006	HNG Oil Company	Oil	Plugged	32.0313	-103.275	Comanche Stateline, Yates	-	-	1682	0.22
3002526134	Wilson 21 Federal #004	Fulfer Oil & Cattle LLC	Oil	Active	32.026	-103.275	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3575	0.24
3002526133	Wilson 21 Federal #003	Fulfer Oil & Cattle LLC	Oil	Active	32.0267	-103.273	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3797	0.33
3002525957	Lea 20 #001	Chance Properties Company	SWD	Plugged	32.0242	-103.28	Capitan Reef	1978	2021	3420	0.34
3002526135	Wilson 21 Federal #005	Fulfer Oil & Cattle LLC	Oil	Active	32.0305	-103.272	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3800	0.35
3002509858	Roy Smith #001	Roy H. Smith Drilling Co.	Oil	Plugged	32.0269	-103.272	Yates	-	-	3940	0.36
3002526138	Wilson 21 Federal #008	Fulfer Oil & Cattle LLC	Oil	Active	32.0343	-103.275	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3700	0.40
3002509856	Sand Hills Unit #006	Sinclair Oil & Gas Company	Oil	Plugged	32.0233	-103.281	Tansill	-	-	1247	0.42
3002527197	Lea 20 7426 JV-S #002	BTA Oil Producers	Oil	Plugged	32.0351	-103.28	Comanche Stateline, Tan-Yates-7R-Qu	-	1982	3670	0.44
3002545837	Camellia Federal Com 26 36 21 #111H	Ameredev Operating, LLC	Oil	New	32.0223	-103.278	Wolfcamp	-	-	0	0.45
3002545918	Camellia Federal Com 26 36 21 #101H	Ameredev Operating, LLC	Oil	New	32.0223	-103.278	Wolfcamp	-	-	0	0.45
3002545897	Camellia Federal Com 26 36 21 #121H	Ameredev Operating, LLC	Oil	Active	32.0223	-103.278	Wolfcamp	2019	-	11992	0.45
3002545982	Camellia Federal Com 26 36 21 #081H	Ameredev Operating, LLC	Oil	New	32.0223	-103.278	Lower Bone Spring	-	-	0	0.45
3002545984	Camellia Federal Com 26 36 21 #091H	Ameredev Operating, LLC	Oil	New	32.0223	-103.278	Lower Bone Spring	-	-	0	0.45
3002526132	Wilson 21 Federal #002	Fulfer Oil & Cattle LLC	Oil	Active	32.0224	-103.275	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3500	0.46
3002509857	Sand Hills Unit #006A	Sinclair Oil & Gas Company	Oil	Plugged	32.0224	-103.281	Capitan Reef	-	-	3349	0.47
3002526137	Wilson 21 Federal #007	Fulfer Oil & Cattle LLC	Oil	Active	32.0342	-103.272	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3700	0.50
3002544112	Wildhog BWX State Com #002H	Ameredev Operating, LLC	Oil	Active	32.0353	-103.282	Wolfcamp	2018	-	12008	0.51
3002526131	Wilson 21 Federal #001	Fulfer Oil & Cattle LLC	Oil	Active	32.0224	-103.273	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3340	0.52
3002544229	Azalea 26 36 28 State #121Y	Ameredev Operating, LLC	Oil	Active	32.0209	-103.278	Wolfcamp	2017	-	12434	0.55
3002544104	Azalea 26 36 28 State #111H	Ameredev Operating, LLC	Oil	Active	32.0209	-103.278	Wolfcamp	2017	-	11966	0.55
3002544105	Azalea 26 36 28 State #121	Ameredev Operating, LLC	Oil	New	32.0209	-103.278	Wolfcamp	2017	-	994	0.55
3002527028	Lea 21, 7406 JV-S #002	Fulfer Oil & Cattle LLC	Oil	Active	32.0306	-103.268	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3658	0.59

3002527029	Lea 21, 7406 JV-S #003	Fulfer Oil & Cattle LLC	Oil	Active	32.0269	-103.268	Comanche Stateline, Tan-Yates-7R-Qu	2010	-	3574	0.60
3002509847	Maralo SV 16 State #006	Maralo Inc	Oil	Plugged	32.0378	-103.276	Sioux Yates	-	-	11492	0.62
3002526806	Maralo 16 State #006Y	Northern Pacific Oil And Gas Incorporated	Oil	Plugged	32.0378	-103.276	Sioux, Tansill-Yates-Seven Rivers	-	2018	3800	0.63
3002526816	Wilson 17 Federal #003	HNG Oil Company	Oil	Plugged	32.0378	-103.281	Sioux, Tansill-Yates-Seven Rivers	-	-	3700	0.64
3002526056	Lea 7406 JV-S #009	BTA Oil Producers	Oil	Plugged	32.0197	-103.275	Comanche Stateline	-	-	1406	0.64
3002526068	Lea 7406 JV-S #009Y	BTA Oil Producers	Oil	Plugged	32.0196	-103.275	Comanche Stateline, Tan-Yates-7R-Qu	-	2009	3270	0.65
3002549931	Azalea 26 36 28 State Com #104H	Ameredev Operating, LLC	Oil	New	32.0209	-103.271	Wolfcamp	-	-	0	0.66
3002549932	Azalea 26 36 28 State Com #123H	Ameredev Operating, LLC	Oil	New	32.0209	-103.271	Wolfcamp	-	-	0	0.66
3002527000	Lea 21, 7406 JV-S #001	Fulfer Oil & Cattle LLC	Oil	Active	32.0342	-103.268	Comanche Stateline, Tan-Yates-7R-Qu	1980	-	3668	0.69
3002527030	Lea 21 7406 JV-S #004	BTA Oil Producers	Oil	Plugged	32.0233	-103.268	Comanche Stateline	-	-	1060	0.70
3002526751	Maralo 16 State #007	Draco Energy, Incorporated	Oil	Plugged	32.0378	-103.272	Sioux, Tansill-Yates-Seven Rivers	-	2003	3800	0.70
3002545983	Camellia Federal Com 26 36 21 #083H	Ameredev Operating, LLC	Oil	New	32.0197	-103.272	Lower Bone Spring	-	-	0	0.71
3002545985	Camellia Federal Com 26 36 21 #093H	Ameredev Operating, LLC	Oil	New	32.0197	-103.272	Lower Bone Spring	-	-	0	0.71
3002545986	Camellia Federal Com 26 36 21 #104H	Ameredev Operating, LLC	Oil	New	32.0197	-103.272	Wolfcamp	-	-	0	0.71
3002545987	Camellia Federal Com 26 36 21 #114H	Ameredev Operating, LLC	Oil	New	32.0197	-103.272	Wolfcamp	-	-	0	0.71
3002545988	Camellia Federal Com 26 36 21 #124H	Ameredev Operating, LLC	Oil	New	32.0197	-103.272	Wolfcamp	-	-	0	0.72
3002527207	Lea 21, 7406 JV-S #004Y	Fulfer Oil & Cattle LLC	Oil	Active	32.0242	-103.267	Comanche Stateline, Tan-Yates-7R-Qu	1981	-	3550	0.72
3002525930	Lea 7406 JV-S #008	BTA Oil Producers	Oil	Plugged	32.019	-103.273	Comanche Stateline, Tan-Yates-7R-Qu	-	2009	3270	0.73
3002549590	Azalea 26 36 28 State Com #125H	Ameredev Operating, LLC	Oil	New	32.0209	-103.269	Wolfcamp	-	-	0	0.74
3002538885	Eagle Feather Federal #002	Ameredev Operating, LLC	Gas	Active	32.0342	-103.267	Pawnee, Strawn	2008	-	13179	0.74
3002542733	Wildhog BWX State Com #001H	Ameredev Operating, LLC	Oil	Active	32.0355	-103.289	Lower Bone Spring, Wolfcamp	2015	-	12517	0.81
3002525920	Lea 7406 JV-S #007	BTA Oil Producers	Oil	Plugged	32.017	-103.278	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3270	0.82
3002527041	Lea 21, 7406 JV-S #006	Fulfer Oil & Cattle LLC	Oil	Active	32.0306	-103.264	Comanche Stateline, Tan-Yates-7R-Qu	1980	-	3495	0.84
3002527042	Lea 21, 7406 JV-S #007	Fulfer Oil & Cattle LLC	Oil	Active	32.0269	-103.264	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3525	0.84
3002526805	Maralo 16 State #010	Northern Pacific Oil And Gas Incorporated	Oil	Active	32.0378	-103.268	Sioux, Tansill-Yates-Seven Rivers	-	-	3800	0.85
3002526753	Maralo 16 State #009	Northern Pacific Oil And Gas Incorporated	Oil	Plugged	32.0415	-103.276	Sioux, Tansill-Yates-Seven Rivers	-	2018	3800	0.88
3002526815	Wilson 17 Federal #002	HNG Oil Company	Oil	Plugged	32.0415	-103.281	Sioux, Tansill-Yates-Seven Rivers	-	-	3700	0.89

3002549933	Azalea 26 36 28 State Com #127H	Ameredev Operating, LLC	Oil	New	32.0209	-103.266	Wolfcamp	-	-	0	0.91
3002527031	Lea 21, 7406 JV-S #005	Fulfer Oil & Cattle LLC	Oil	Active	32.0342	-103.264	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3660	0.91
3002527043	Lea 21, 7406 JV-S #008	Fulfer Oil & Cattle LLC	Oil	Active	32.0233	-103.264	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3570	0.92
3002526752	Maralo 16 State #008	Northern Pacific Oil And Gas Incorporated	Oil	Plugged	32.0415	-103.272	Sioux, Tansill-Yates-Seven Rivers	-	2018	3750	0.93
3002525909	Lea 7406 JV-S #006	BTA Oil Producers	Oil	Plugged	32.0151	-103.273	Comanche Stateline, Tan-Yates-7R-Qu	-	2009	3250	0.98
3002509848	Maralo 16 State #005	Draco Energy, Incorporated	Oil	Plugged	32.0415	-103.268	Sioux, Tansill-Yates-Seven Rivers	-	2003	4149	1.05
3002546204	Green Jacket 26 36 29 Federal Com #101H	Ameredev Operating, LLC	Oil	New	32.0208	-103.293	Wolfcamp	-	-	0	1.05
3002546205	Green Jacket 26 36 29 Federal Com #111H	Ameredev Operating, LLC	Oil	New	32.0208	-103.293	Wolfcamp	-	-	0	1.05
3002540170	Good Chief State #001	Northern Pacific Oil And Gas Incorporated	Oil	Plugged	32.0206	-103.263	Comanche Stateline, Tan-Yates-7R-Qu	2011	2018	3873	1.06
3002546206	Green Jacket 26 36 29 Federal Com #121H	Ameredev Operating, LLC	Oil	New	32.0208	-103.293	Wolfcamp	-	-	0	1.06
3002525841	Quanah Parker #002	Gifford, Mitchell & Wisenb.	Oil	Plugged	32.0151	-103.269	Comanche Stateline	-	-	284	1.08
3002525890	Lea 7406 JV-S #005	BTA Oil Producers	Oil	Plugged	32.0133	-103.275	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3266	1.08
3002523197	South Lea Federal #001	Energen Resources Corporation	Gas	Plugged	32.0415	-103.289	Pawnee, Strawn	1969	2015	21252	1.10
3002509849	Sand Hills Unit #007	Sinclair Oil & Gas Company	Oil	Plugged	32.0378	-103.293	Tansill	-	-	3471	1.11
3002525911	Quanah Parker #002Y	Whiting Oil And Gas Corporation	Oil	Plugged	32.0146	-103.269	Comanche Stateline, Tan-Yates-7R-Qu	-	2005	3258	1.11
3002526644	Maralo 16 State #002	Northern Pacific Oil And Gas Incorporated	Oil	Plugged	32.0451	-103.276	Sioux, Tansill-Yates-Seven Rivers	-	2018	3770	1.12
3002526814	Wilson 17 Federal #001	HNG Oil Company	Oil	Plugged	32.0451	-103.281	Sioux, Tansill-Yates-Seven Rivers	-	-	3800	1.13
3002527163	American Eagle #001	Whiting Oil And Gas Corporation	Oil	Plugged	32.0233	-103.259	Comanche Stateline, Tan-Yates-7R-Qu	1981	2005	3550	1.15
3002526646	Maralo 16 State #004	Northern Pacific Oil And Gas Incorporated	Oil	Plugged	32.0451	-103.272	Sioux, Tansill-Yates-Seven Rivers	1980	2018	3780	1.17
3002526984	Wilson 17 Federal #004Z	HNG Oil Company	Oil	Plugged	32.0451	-103.285	Sioux, Tansill-Yates-Seven Rivers	-	-	3603	1.19
3002526960	Wilson 17 Federal #004Y	HNG Oil Company	Oil	Plugged	32.0451	-103.285	Sioux Yates	-	-	1331	1.19
3002526845	Wilson 17 Federal #004	HNG Oil Company	Oil	Plugged	32.0451	-103.285	Sioux Yates	-	-	1950	1.20
3002526987	Buffalo Hump #002	Whiting Oil And Gas Corporation	Oil	Plugged	32.0197	-103.259	Comanche Stateline, Tan-Yates-7R-Qu	-	2005	3545	1.25
3002525829	Lea 7406 JV-S #004	BTA Oil Producers	Oil	Plugged	32.0115	-103.271	Comanche Stateline, Tan-Yates-7R-Qu	-	2009	3268	1.26
3002544111	Prizehog BWZ State Com #002H	Ameredev Operating, LLC	Oil	Active	32.0338	-103.299	Wolfcamp	2018	-	12366	1.28
3002525953	New Mexico CV State #001	Whiting Oil And Gas Corporation	Oil	Plugged	32.0115	-103.269	Comanche Stateline, Tan-Yates-7R-Qu	1978	2005	3239	1.30
3002549277	Prizehog B Federal State Com #001H	Ameredev Operating, LLC	Oil	New	32.0224	-103.299	Wolfcamp	-	-	0	1.30



3002526546	Maralo 16 State #001	RMR Operating, LLC	Oil	Plugged	32.0487	-103.276	Sioux, Tansill-Yates-Seven Rivers	1979	2012	3800	1.37
3002527288	Lea "17", 7426 JV-S #001	BTA Oil Producers	Oil	Plugged	32.0487	-103.281	Comanche Stateline	-	-	2879	1.38
3002526877	Buffalo Hump #001	Whiting Oil And Gas Corporation	Oil	Plugged	32.0159	-103.259	Comanche Stateline, Tan-Yates-7R-Qu	-	2005	3585	1.40
3002526922	Maralo 16 State #003Y	Draco Energy, Incorporated	Oil	Plugged	32.0486	-103.272	Sioux, Tansill-Yates-Seven Rivers	-	2003	3800	1.40
3002526557	Pawnee Deep Unit #001	Heritage Resources, Inc.	Oil	Plugged	32.0315	-103.254	Bone Spring	1979	2014	18577	1.40
3002526645	Maralo SV 16 State #003	Maralo LLC	Oil	Plugged	32.0487	-103.272	Sioux, Yates	-	-	1576	1.41
3002525784	Lea 7406 JV-S #003	BTA Oil Producers	Oil	Plugged	32.0079	-103.275	Capitan Reef	-	-	887	1.45
3002525702	Lea 7406 JV-S #002	BTA Oil Producers	Oil	Plugged	32.0079	-103.271	Comanche Stateline, Tan-Yates-7R-Qu	-	2009	3349	1.49
3002527094	Buffalo Hump #003	RR Cagle	Oil	Plugged	32.0197	-103.255	Comanche Stateline	-	-	3608	1.50
3002525778	Quanah Parker #001	Whiting Oil And Gas Corporation	Oil	Plugged	32.0079	-103.269	Comanche Stateline, Tan-Yates-7R-Qu	-	2005	-9	1.53
3002527129	Buffalo Hump #008	Whiting Oil And Gas Corporation	Oil	Plugged	32.0124	-103.259	Comanche Stateline, Tan-Yates-7R-Qu	-	2005	3606	1.56
3002544810	Magnolia 26 36 22 State Com #125H	Ameredev Operating, LLC	Oil	Active	32.0226	-103.252	Wolfcamp	2019	-	11449	1.57
3002525923	Horse Back #004	Gifford, Mitchell & Wisenb.	Oil	Plugged	32.0061	-103.271	Comanche Stateline	-	-	748	1.61
3002526258	Wilson 9 Federal #002	Enron Oil & Gas Company	Oil	Plugged	32.0523	-103.276	Sioux, Tansill-Yates-Seven Rivers	-	-	3800	1.62
3002525954	Horse Back #004Y	Gifford, Mitchell & Wisenb.	Oil	Plugged	32.0059	-103.271	Comanche Stateline	-	-	749	1.63
3002526048	New Mexico CV State #002	Whiting Oil And Gas Corporation	Oil	Plugged	32.0079	-103.265	Comanche Stateline, Tan-Yates-7R-Qu	-	2004	3400	1.63
3002526259	Wilson 9 Federal #003	HNG Oil Company	Oil	Plugged	32.0523	-103.272	Sioux, Tansill-Yates-Seven Rivers	-	-	3684	1.65
3002509843	Sand Hills Unit #003	Sinclair Oil & Gas Company	Oil	Plugged	32.0523	-103.285	Tansill-Yates-Seven Rivers	-	-	5500	1.67
3002546665	Holly 26 36 05 Federal Com #104H	Ameredev Operating, LLC	Oil	New	32.0507	-103.29	Wolfcamp	2020	-	0	1.67
3002526253	Wilson 8 Federal #007	HNG Oil Company	Oil	Plugged	32.0529	-103.284	Sioux, Tansill-Yates-Seven Rivers	-	-	3700	1.70
3002526717	Wilson 9 Federal #006	HNG Oil Company	Oil	Plugged	32.0523	-103.268	Sioux, Tansill-Yates-Seven Rivers	-	-	3650	1.72
3002525907	Horseback #003	Whiting Oil And Gas Corporation	Oil	Plugged	32.0049	-103.269	Comanche Stateline, Tan-Yates-7R-Qu	-	2005	3255	1.73
3002526044	Horseback #007	Whiting Oil And Gas Corporation	Oil	Plugged	32.0043	-103.271	Comanche Stateline, Tan-Yates-7R-Qu	-	2005	-9	1.74
3002527127	Buffalo Hump #005	Whiting Oil And Gas Corporation	Oil	Plugged	32.0124	-103.255	Comanche Stateline, Tan-Yates-7R-Qu	-	2005	3554	1.75
3002542744	Prizehog BWZ State Com #001H	Ameredev Operating, LLC	Oil	Active	32.0351	-103.307	Lower Bone Spring; Wolfcamp	2015	-	12778	1.79
3002540169	Big Brave State #001	Northern Pacific Oil And Gas Incorporated	Oil	Plugged	32.0061	-103.263	Comanche Stateline, Tan-Yates-7R-Qu	2011	2018	999	1.80
3002549275	Prizehog A Federal State Com #001H	Ameredev Operating, LLC	Oil	New	32.0222	-103.308	Wolfcamp	-	-	0	1.85

3002549276	Prizehog A Federal State Com #002H	Ameredev Operating, LLC	Oil	New	32.0222	-103.308	Wolfcamp	-	-	0	1.85
3002525925	Horseback #006	Whiting Oil And Gas Corporation	Oil	Plugged	32.0043	-103.265	Comanche Stateline, Tan-Yates-7R-Qu	-	2005	-9	1.86
3002525354	Horse Back #001	Gifford, Mitchell & Wisenb.	Oil	Plugged	32.0031	-103.268	Montoya	-	-	21750	1.87
3002526254	Wilson 9 Federal #001	HNG Oil Company	Oil	Plugged	32.056	-103.276	Sioux, Tansill-Yates-Seven Rivers	-	-	3730	1.87
3002526249	Wilson 8 Federal #003	HNG Oil Company	Oil	Plugged	32.056	-103.281	Sioux, Tansill-Yates-Seven Rivers	-	-	3795	1.88
3002509842	Sand Hills Unit #008	Sinclair Oil & Gas Company	Oil	Plugged	32.0532	-103.293	Tansill	-	-	3348	1.89
3002526260	Wilson 9 Federal #004	HNG Oil Company	Oil	Plugged	32.056	-103.272	Sioux, Tansill-Yates-Seven Rivers	-	-	3700	1.90
3002527128	Buffalo Hump #006	Whiting Oil And Gas Corporation	Oil	Plugged	32.0088	-103.255	Comanche Stateline, Tan-Yates-7R-Qu	-	2005	3564	1.92
3002524719	Dogie Draw Federal #001	HNG Oil Company	Oil	Plugged	32.056	-103.285	Fusselman	-	-	20971	1.92
3002525662	Horseback #002	Whiting Oil And Gas Corporation	Oil	Plugged	32.0022	-103.268	Comanche Stateline, Tan-Yates-7R-Qu	-	2005	-9	1.92
3002526251	Wilson 8 Federal #005	HNG Oil Company	Oil	Plugged	32.0564	-103.284	Sioux, Tansill-Yates-Seven Rivers	-	-	3700	1.94
3002526979	Iron Mountain #001	RR Cagle	Oil	Plugged	32.0052	-103.259	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3624	1.95
3002526716	Wilson 9 Federal #005	HNG Oil Company	Oil	Plugged	32.056	-103.268	Sioux, Tansill-Yates-Seven Rivers	-	-	3700	1.96

**TABLE A-2. WELLS LOCATED WITHIN ONE MILE OF THE PROPOSED SALT CREEK AGI #2**

API	Well Name	Operator	Well Type	Status	Lat. (NAD83)	Long. (NAD83)	Pool	Spud Year	Plug Year	Total Depth (ft)	Miles from AGI
3002546746	Salt Creek AGI #001	Salt Creek Midstream, LLC	AGI	New	32.02816	-103.278	Delaware	-	-	0	0.05
3002526718	Wilson 21 Federal #006Y	Enron Oil & Gas Company	Oil	Plugged	32.0313	-103.276	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3750	0.21
3002526136	Wilson 21 Federal #006	HNG Oil Company	Oil	Plugged	32.0313	-103.275	Comanche Stateline	-	-	1682	0.22
3002526134	Wilson 21 Federal #004	Fulfer Oil & Cattle LLC	Oil	Active	32.026	-103.275	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3575	0.24
3002526133	Wilson 21 Federal #003	Fulfer Oil & Cattle LLC	Oil	Active	32.0267	-103.273	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3797	0.33
3002525957	Lea 20 #001	Chance Properties Company	SWD	Plugged	32.0242	-103.28	Capitan Reef	1978	2021	3420	0.34
3002526135	Wilson 21 Federal #005	Fulfer Oil & Cattle LLC	Oil	Active	32.0305	-103.272	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3800	0.35
3002509858	Roy Smith #001	Roy H. Smith Drilling Co.	Oil	Plugged	32.0269	-103.272	Yates	-	-	3940	0.36
3002526138	Wilson 21 Federal #008	Fulfer Oil & Cattle LLC	Oil	Active	32.0343	-103.275	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3700	0.40
3002509856	Sand Hills Unit #006	Sinclair Oil & Gas Company	Oil	Plugged	32.0233	-103.281	Tansill	-	-	1247	0.42
3002527197	Lea 20 7426 JV-S #002	BTA Oil Producers	Oil	Plugged	32.0351	-103.28	Comanche Stateline, Tan-Yates-7R-Qu	-	1982	3670	0.44
3002545837	Camellia Federal Com 26 36 21 #111H	Ameredev Operating, LLC	Oil	New	32.0223	-103.278	Wolfcamp	-	-	0	0.45
3002545918	Camellia Federal Com 26 36 21 #101H	Ameredev Operating, LLC	Oil	New	32.0223	-103.278	Wolfcamp	-	-	0	0.45
3002545897	Camellia Federal Com 26 36 21 #121H	Ameredev Operating, LLC	Oil	Active	32.0223	-103.278	Wolfcamp	2019	-	11992	0.45
3002545982	Camellia Federal Com 26 36 21 #081H	Ameredev Operating, LLC	Oil	New	32.0223	-103.278	Lower Bone Spring	-	-	0	0.45
3002545984	Camellia Federal Com 26 36 21 #091H	Ameredev Operating, LLC	Oil	New	32.0223	-103.278	Lower Bone Spring	-	-	0	0.45
3002526132	Wilson 21 Federal #002	Fulfer Oil & Cattle LLC	Oil	Active	32.0224	-103.275	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3500	0.46
3002509857	Sand Hills Unit #006A	Sinclair Oil & Gas Company	Oil	Plugged	32.0224	-103.281	Capitan Reef	-	-	3349	0.47
3002526137	Wilson 21 Federal #007	Fulfer Oil & Cattle LLC	Oil	Active	32.0342	-103.272	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3700	0.50
3002544112	Wildhog BWX State Com #002H	Ameredev Operating, LLC	Oil	Active	32.0353	-103.282	Wolfcamp	2018	-	12008	0.51
3002526131	Wilson 21 Federal #001	Fulfer Oil & Cattle LLC	Oil	Active	32.0224	-103.273	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3340	0.52
3002544229	Azalea 26 36 28 State #121Y	Ameredev Operating, LLC	Oil	Active	32.0209	-103.278	Wolfcamp	2017	-	12434	0.55
3002544104	Azalea 26 36 28 State #111H	Ameredev Operating, LLC	Oil	Active	32.0209	-103.278	Wolfcamp	2017	-	11966	0.55
3002544105	Azalea 26 36 28 State #121	Ameredev Operating, LLC	Oil	New	32.0209	-103.278	Wolfcamp	2017	-	994	0.55
3002527028	Lea 21, 7406 JV-S #002	Fulfer Oil & Cattle LLC	Oil	Active	32.0306	-103.268	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3658	0.59

3002527029	Lea 21, 7406 JV-S #003	Fulfer Oil & Cattle LLC	Oil	Active	32.0269	-103.268	Comanche Stateline, Tan-Yates-7R-Qu	2010	-	3574	0.60
3002509847	Maralo SV 16 State #006	Maralo LLC	Oil	Plugged	32.0378	-103.276	Sioux Yates	-	-	11492	0.62
3002526806	Maralo 16 State #006Y	Northern Pacific Oil And Gas Incorporated	Oil	Plugged	32.0378	-103.276	Sioux, Tansill-Yates-Seven Rivers	-	2018	3800	0.63
3002526816	Wilson 17 Federal #003	HNG Oil Company	Oil	Plugged	32.0378	-103.281	Sioux, Tansill-Yates-Seven Rivers	-	-	3700	0.64
3002526056	Lea 7406 JV-S #009	BTA Oil Producers	Oil	Plugged	32.0197	-103.275	Yates	-	-	1406	0.64
3002526068	Lea 7406 JV-S #009Y	BTA Oil Producers	Oil	Plugged	32.0196	-103.275	Comanche Stateline, Tan-Yates-7R-Qu	-	2009	3270	0.65
3002549931	Azalea 26 36 28 State Com #104H	Ameredev Operating, LLC	Oil	New	32.0209	-103.271	Wolfcamp	-	-	0	0.66
3002549932	Azalea 26 36 28 State Com #123H	Ameredev Operating, LLC	Oil	New	32.0209	-103.271	Wolfcamp	-	-	0	0.66
3002527000	Lea 21, 7406 JV-S #001	Fulfer Oil & Cattle LLC	Oil	Active	32.0342	-103.268	Comanche Stateline, Tan-Yates-7R-Qu	1980	-	3668	0.69
3002527030	Lea 21 7406 JV-S #004	BTA Oil Producers	Oil	Plugged	32.0233	-103.268	Comanche Stateline	-	-	1060	0.70
3002526751	Maralo 16 State #007	Draco Energy, Incorporated	Oil	Plugged	32.0378	-103.272	Sioux, Tansill-Yates-Seven Rivers	-	2003	3800	0.70
3002545983	Camellia Federal Com 26 36 21 #083H	Ameredev Operating, LLC	Oil	New	32.0197	-103.272	Lower Bone Spring	-	-	0	0.71
3002545985	Camellia Federal Com 26 36 21 #093H	Ameredev Operating, LLC	Oil	New	32.0197	-103.272	Lower Bone Spring	-	-	0	0.71
3002545986	Camellia Federal Com 26 36 21 #104H	Ameredev Operating, LLC	Oil	New	32.0197	-103.272	Wolfcamp	-	-	0	0.71
3002545987	Camellia Federal Com 26 36 21 #114H	Ameredev Operating, LLC	Oil	New	32.0197	-103.272	Wolfcamp	-	-	0	0.71
3002545988	Camellia Federal Com 26 36 21 #124H	Ameredev Operating, LLC	Oil	New	32.0197	-103.272	Wolfcamp	-	-	0	0.72
3002527207	Lea 21, 7406 JV-S #004Y	Fulfer Oil & Cattle LLC	Oil	Active	32.0242	-103.267	Comanche Stateline, Tan-Yates-7R-Qu	1981	-	3550	0.72
3002525930	Lea 7406 JV-S #008	BTA Oil Producers	Oil	Plugged	32.019	-103.273	Comanche Stateline, Tan-Yates-7R-Qu	-	2009	3270	0.73
3002549590	Azalea 26 36 28 State Com #125H	Ameredev Operating, LLC	Oil	New	32.0209	-103.269	Wolfcamp	-	-	0	0.74
3002538885	Eagle Feather Federal #002	Ameredev Operating, LLC	Gas	Active	32.0342	-103.267	Pawnee, Strawn	2008	-	13179	0.74
3002542733	Wildhog BWX State Com #001H	Ameredev Operating, LLC	Oil	Active	32.0355	-103.289	Lower Bone Spring, Wolfcamp	2015	-	12517	0.81
3002525920	Lea 7406 JV-S #007	BTA Oil Producers	Oil	Plugged	32.017	-103.278	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3270	0.82
3002527041	Lea 21, 7406 JV-S #006	Fulfer Oil & Cattle LLC	Oil	Active	32.0306	-103.264	Comanche Stateline, Tan-Yates-7R-Qu	1980	-	3495	0.84
3002527042	Lea 21, 7406 JV-S #007	Fulfer Oil & Cattle LLC	Oil	Active	32.0269	-103.264	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3525	0.84
3002526805	Maralo 16 State #010	Northern Pacific Oil And Gas Incorporated	Oil	Active	32.0378	-103.268	Sioux, Tansill-Yates-Seven Rivers	-	-	3800	0.85
3002526753	Maralo 16 State #009	Northern Pacific Oil And Gas Incorporated	Oil	Plugged	32.0415	-103.276	Sioux, Tansill-Yates-Seven Rivers	-	2018	3800	0.88
3002526815	Wilson 17 Federal #002	HNG Oil Company	Oil	Plugged	32.0415	-103.281	Sioux, Tansill-Yates-Seven Rivers	-	-	3700	0.89

3002549933	Azalea 26 36 28 State Com #127H	Ameredev Operating, LLC	Oil	New	32.0209	-103.266	Wolfcamp	-	-	0	0.91
3002527031	Lea 21, 7406 JV-S #005	Fulfer Oil & Cattle LLC	Oil	Active	32.0342	-103.264	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3660	0.91
3002527043	Lea 21, 7406 JV-S #008	Fulfer Oil & Cattle LLC	Oil	Active	32.0233	-103.264	Comanche Stateline, Tan-Yates-7R-Qu	-	-	3570	0.92
3002526752	Maralo 16 State #008	Northern Pacific Oil And Gas Incorporated	Oil	Plugged	32.0415	-103.272	Sioux, Tansill-Yates-Seven Rivers	-	2018	3750	0.93
3002525909	Lea 7406 JV-S #006	BTA Oil Producers	Oil	Plugged	32.0151	-103.273	Comanche Stateline, Tan-Yates-7R-Qu	-	2009	3250	0.98

## ATTACHMENT A-1

RELEVANT PLUGGING DOCUMENTS FROM NMOCD  
FOR WELLS PENETRATING THE INJECTION ZONE  
WITHIN TWO MILES OF THE PROPOSED SALT CREEK  
AGI #2

**SOUTH LEA FEDERAL #001  
(API 30-025-23197)**

**RELEVANT PLUGGING DOCUMENTS**

Form 3160-5  
(August 2007)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

OCD Hobbs

FORM APPROVED  
OMB NO. 1004-0135  
Expires: July 31, 2010

**SUNDRY NOTICES AND REPORTS ON WELLS**  
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.*

5. Lease Serial No.  
NMNM18644

6. If Indian, Allottee or Tribe Name

7. If Unit or CA/Agreement, Name and/or No.

8. Well Name and No.  
SOUTH LEA FEDERAL 001

9. API Well No.  
30-025-23197

10. Field and Pool, or Exploratory  
PAWNEE STRAWN; 97040

11. County or Parish, and State  
LEA COUNTY, NM

**SUBMIT IN TRIPLICATE - Other instructions on reverse side.**

1. Type of Well  
 Oil Well  Gas Well  Other

2. Name of Operator  
ENERGEN RESOURCES CORPORATION  
Contact: BRENDA F RATHJEN  
Email: brenda.rathjen@energen.com

3a. Address  
3510 NORTH "A" STREET BLGS A & B  
MIDLAND, TX 79705

3b. Phone No. (include area code)  
Ph: 432-688-3323

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)  
Sec 17 T26S R36E Mer NMP NESW 1980FSL 1980FWL

HOBBS OCD  
DEC 21 2015  
RECEIVED

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NAT

TYPE OF SUBMISSION	OTHER DATA
<input type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize
<input checked="" type="checkbox"/> Subsequent Report	<input type="checkbox"/> Deepen
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Alter Casing
	<input type="checkbox"/> Fracture
	<input type="checkbox"/> Casing Repair
	<input type="checkbox"/> New Construction
	<input checked="" type="checkbox"/> Plug and Abandon
	<input type="checkbox"/> Plug Back
	<input type="checkbox"/> Water Disposal

E-PERMITTING <SWD  
CONVERSION  
RETURN TO  
CSNG  
INT TO PA  
ENVIRO  
P&A NR  
INJECTION  
RBDMS  
TA  
CHG LOC  
P&A R

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplate horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

ATTACHED IS THE P&A PROCEDURE AS SUBMITTED FROM THE PLUGGING COMPANY FOR THE SOUTH LEA FEDERAL #1.  
THANK YOU.

12-17-15

Accepted as to plugging of the well bore.  
Liability under bond is retained until  
Surface restoration is completed.

14. I hereby certify that the foregoing is true and correct.

**Electronic Submission #309836 verified by the BLM Well Information System  
For ENERGEN RESOURCES CORPORATION, sent to the Hobbs  
Committed to AFMSS for processing by LINDA JIMENEZ on 08/31/2015 ()**

Name (Printed/Typed) BRENDA F RATHJEN Title REGULATORY ANALYST

Signature (Electronic Submission) Date 07/21/2015

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

ACCEPTED FOR RECORD  
DEC 9 2015  
CARLSBAD FIELD OFFICE

Approved By \_\_\_\_\_ Title \_\_\_\_\_ Date \_\_\_\_\_

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office \_\_\_\_\_

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

\*\* OPERATOR-SUBMITTED \*\* OPERATOR-SUBMITTED \*\* OPERATOR-SUBMITTED \*\*



Form 3160-5  
(April 2004)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

FORM APPROVED  
OMB No. 1004-0137  
Expires: March 31, 2007

**SUNDRY NOTICES AND REPORTS ON WELLS**  
*Do not use this form for proposals to drill or to re-enter an abandoned well Use Form 3160-3 (APD) for such proposals*  
**SUBMIT IN TRIPLICATE - Other instructions on reverse side.**

1. Type of Well Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other <input type="checkbox"/>		5. Lease Serial No. <b>NMNM18644</b>
2. Name of Operator <b>Energen Resources Corporation</b>		6. If Indian, Allottee or Tribe Name
3a. Address <b>3510 N. 'A' St, Bldg A&amp;B Midland, TX 79705</b>		7. If Unit of CA / Agreement, Name and/or No.
3b. Phone No. (include area code) <b>432-688-3323</b>		8. Well Name and No. <b>South Lea Federal 001</b>
4. Location of (Footage, Sec., T., R., or Survey Description) <b>Sec 17 T26S R36E Mer NMP NESW 1980 FSL 1980FWL</b>		9. API Well No. <b>30-025-23197</b>
		10. Field and Pool, or Exploratory Area <b>Pawnee Strawn; 97040</b>
		11. County or Parish, State <b>Lea, NM</b>

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-off
<input checked="" type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Fracture Treat	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input type="checkbox"/> Other _____
	<input type="checkbox"/> Change Plans	<input checked="" type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the bond No. on file with the BLM / BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in multiple completion or recompletion in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

SEE ATTACHED

14. I hereby certify that the following is true and correct	
Name <i>Brenda Frathen - Energen Resources - Regulatory Analyst - 7/13/15 432-688-3323</i>	Title <b>P&amp;A Tech</b>
Signature <i>Greg Bryant</i>	Date <b>6/20/15</b>

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by	Title	Date
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.	Office	

**ACCEPTED FOR RECORD**

DEC 9 2015

BUREAU OF LAND MANAGEMENT  
CARLSBAD FIELD OFFICE

Title 18 U.S.C. Section 1001 and Title 43 U.S.C., Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

Energen Resources – South Lea Federal 001 – 30-025-23197

Subsequent Report of Plug and Abandonment

4/8/15---MIRU

4/9/15---RIH w/ WL & Tag in Tbg @ 12,675'

4/10/15---Unset PKR & start to POOH w/ 2 $\frac{3}{4}$ " Tbg, total of 180 stands so far, PKR depth was 10,436'

4/11/15---Finish POOH w/ Tbg, total of 195 stands (12,347' EOT). RIH w/ gauge ring to 12,630'. Pat @ BLM OK'd to set 5" CIBP @ 12,500' tomorrow

4/14/15---Set 5" CIBP @ 12,500'. RIH Tbg, kept getting behind liner @ 10,510'

4/15/15---Still cannot get inside liner, POOH. RIH w/ mule shoe, tag CIBP @ 12,500'. Spot 40sx H cmt @ 12,500' to CTOC 12,055'

4/16/15---POOH Tbg. RIH w/ 5" model R PKR & set @ 10,574'. RIH WL to perf @ 11,560' – WL stuck @ 11,500'

4/17/15---Still cannot get WL free. Set off perf charges @ 11,500'

4/20/15---Cut WL & POOH w/ 5000' line. Able to pump down line through Tbg – Sqz 80sx cmt @ 11,500' to CTOC 11,316'. SIW on slight vacuum.

4/21/15---Test below PKR, holding 750#. RIH WL & cannot get past 5,038'. Attempt to POOH w/ PKR, stuck inside 5" liner, worked pipe, still stuck.

4/23/15---Cut Tbg @ 5,044' & POOH. RIH w/ perf sub to 5,044', back off @ 8,250', POOH.

4/27/15---RIH PKR to 4,432', test well, holding 1300#, POOH

4/28/15---RIH w/ 2 $\frac{3}{4}$ " Tbg & corkscrew wireline catch to 8,105', tried retrieving wireline & Tbg parted @ 7,472'. POOH Tbg.

4/29/15---RIH 7" gauge ring to 2,281'. RIH w/ overshot – POOH w/ 77 jts of Tbg and overshot.

4/30/15---Tag w/ 2 $\frac{3}{4}$ " Tbg @ 4,793'

5/1/15---Cannot catch fish, POOH Tbg. RIH w/ new grapple – start pulling on Tbg, parted @ 37'

5/4/15---Cannot catch fish

5/5/15---Cannot catch fish. Got a fisherman on location, finally got onto fish

5/6/15---Backed off 3 jts below overshot @ 158', LD Tbg. RIH w/ OS & backed off @ 4505'. LD Tbg

5/7/15---Run tally on PH6 Tbg. RIH w/ 137 jts Tbg

5/8/15---Cannot get past 6,380'. POOH

5/11/15---RIH w/ 6 $\frac{3}{4}$ " impression block to 6,388', wire on block, POOH

5/12/15---RIH w/ wire spear to 6,413', POOH w/ 1000' wire, start to RIH w/ overshot

5/13/15---TD @ 6,691', POOH w/ no fish. RIH w/ wire spear & POOH w/ 3000' wire

5/14/15---RIH w/ overshot to 7,450' – SD for weather

5/15/15---POOH, no fish. RIH w/ spear, POOH w/ 150'-200' of wire

5/18/15---RIH overshot to 7,485', POOH w/ no fish

5/19/15---RIH w/ impression block to 7,485'

5/20/15---POOH, block shows more wire. RIH w/ Cut Right w/ Diamond Cut inserts to 7,485' – POOH w/ no fish

5/21/15---RIH w/ wire spear to 7,485', POOH w/ no wire. Start RIH w/ overshot

5/22/15---Worked over fish w/ overshot, POOH w/ no fish

5/26/15---RIH w/ 6¼" concave mill to 7,485', milled 2-3 hrs, POOH w/ Tbg

5/27/15---RIH w/ overshot and Jars to 7,485', cannot get fish, POOH. RIH w/ new grapple

5/28/15---Overshot on fish, jarred on fish @ 7,485' for 5 hrs, made 1'. Jarred and bumped fish, worked up to 7,479'

6/1/15---RIH w/ washpipe to 7,479' & rotated on fish – made hole down to 7,505', cannot POOH. Jarred on Tbg all day

6/2/15---Freepoint shows 100% free @ 7,411'. Con't jarring – no success

6/3/15---Con't jarring – no success

6/4/15---Backed off below jars @ 7,418'. POOH w/ jars, leaving 1 jt of washpipe w/ bushing & shoe. RIH w/ PKR

6/5/15---Set PKR @ 6,979', test well, holding 1450#. Jim Amos OK to spot 40sx cmt. POOH w/ PKR

6/8/15---RIH w/ perf sub to 6,987' – Spot 40sx cmt @ 6,987' to CTOC 6,767'

6/9/15---Tag @ 6,738'. Perf @ 6,680' (per BLM - Jim Amos). Test well – held 1800# - Spot 40sx cmt @ 6,738' to CTOC 6,518'

6/10/15---Tag @ 6,397'. BLM – Jim Amos – says to go back to procedure. Perf @ 5,300' – Sqz 80sx cmt to 5,100'

6/11/15---Tag @ 5,094'. Pump 150bbl MLF. Spot 200sx cmt @ 4,102' to CTOC 3,533'

6/12/15---Tag @ 3,558'. Spot 90sx cmt @ 3,558' to CTOC 3,320' – Tag @ 3,486'. BLM – Pat ok'd to spot 70sx cmt @ 3,486' to CTOC 3,301'

6/15/15---Tag @ 3,442'. BLM ok'd to spot 45sx cmt @ 3,419' to CTOC 3,300' – Tag @ 3,305'. Spot 45sx cmt @ 1,899' to CTOC 1,780'

6/16/15---Tag @ 1,713'. Test well – held 1800#. Perf @ 690' – Sqz 85sx cmt to 540'

6/17/15---Tag @ 504'. Perf @ 100' – cannot est rate w/ 1500#. BLM – Pat OK'd to spot cmt to surface – RIH to 155' – pump 80sx cmt to surface inside 10¼". RDMO

**PAWNEE DEEP UNIT #001  
(API 30-025-26557)**

**RELEVANT PLUGGING DOCUMENTS**

Office District I 1625 N. French Dr., Hobbs, NM 88240 District II 1301 W. Grand Ave., Artesia, NM 88210 District III 1000 Rio Brazos Rd., Aztec, NM 87410 District IV 1220 S. St. Francis Dr., Santa Fe, NM 87505

Energy, Minerals and Natural Resources

May 27, 2004

HOBBS OGD

JUN 19 2014

OIL CONSERVATION DIVISION

1220 South St. Francis Dr. Santa Fe, NM 87505

WELL API NO. 30-025-26557
5. Indicate Type of Lease STATE [X] FEE [ ]
6. State Oil & Gas Lease No. LG 3340
7. Lease Name or Unit Agreement Name Pawnee Deep Unit
8. Well Number 1
9. OGRID Number 289348
10. Pool name or Wildcat Bone Spring

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)
1. Type of Well: Oil Well [X] Gas Well [ ] Other [ ]
2. Name of Operator Heritage Resources, Inc.
3. Address of Operator 3131 McKinney, Avenue, Suite 710 Dallas, Texas 75204

4. Well Location
Unit Letter F : 1650 feet from the North line and 2310 feet from the West line
Section 22 Township 26S Range 36E NMPM County LEA

11. Elevation (Show whether DR, RKB, RT, GR, etc.)

Pit or Below-grade Tank Application [ ] or Closure [ ]
Pit type Depth to Groundwater Distance from nearest fresh water well Distance from nearest surface water
Pit Liner Thickness: mil Below-Grade Tank: Volume bbls; Construction Material

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

E-PERMITTING - CSNG
PERFORM (P&A) TA [ ] ON [ ]
TEMPORARY COMP [ ] NEW WELL [ ]
PULL OR LOC CHG [ ]
OTHER: [ ]
SUBSEQUENT REPORT OF:
REMEDIAL WORK [ ] ALTERING CASING [ ]
COMMENCE DRILLING OPNS. [ ] P AND A [X]
CASING/CEMENT JOB [ ]
OTHER: [ ]

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 1103. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

- 5/13/14- Spot 50sx Cmt @ 6340' POOH WOC & Tag @ 6338' Spoke w/ Mark RRC advised to spot 50sx more WOC & Tag. RIH w/ Tbg. Tag Cmt @ 6268' POOH
5/20/14- Perf @ 5000' RIH w/ Pkr to 4850' Sqz 75sx Cmt WOC & Tag @ 4785'
5/21/14- @ 2995' Load hole set Pkr & Pump fluid up to 2000 PSI. Did not Sqz down to 2230' Spot 65sx Cmt. POOH w/ Tbg WOC & Tag RIH w/ Tbg Cmt @ 2180' Spot 65sx more @ 2119' WOC & Tag @ 1956'
5/22/14- Perf @ 975' Set Pkr @ 847' Sqz 100sx Cmt WOC & Tag @ 838' POOH w/ Pkr. Pump fluid to backside up to 300 PSI. Advised to RBIH w/ Pkr to 260' Sqz 100sx Cmt. Pump fluid did not get Pres. RIH w/ Tbg. Did not Tag Cmt
5/23/14- 100sx Started pump Cmt Pres. to 1500 PSI. Was able to Sqz 35sx Co. Man advised to Disp to 302' Shut Tbg valve w/ 1000 PSI & SDFD
5/27/14- Perf @ 60' Try Sqz. Did not Inj. RIH w/ Tbg to 230' spot Cmt to Surf. Visual w/ 85sx Cmt. WOC & Tag @ 10'

I hereby certify that the information above is true and complete to the best of my knowledge and belief. I further certify that any pit or below-grade tank has been/will be constructed or closed according to NMOCD guidelines [ ], a general permit [ ] or an (attached) alternative OCD-approved plan [ ].

SIGNATURE [Signature] TITLE General Manager DATE 6.2.14

Type or print name E-mail address: Telephone No.

APPROVED BY: [Signature] TITLE Dist. Supervisor DATE 6/23/2014

Conditions of Approval (if any):

HERITAGE RESOURCES, INC.

June 16, 2014

HOBBS OCD

JUN 19 2014

RECEIVED

New Mexico Energy, Minerals and Natural Resources Department  
Oil Conservation Division  
1625 N. French Drive  
Hobbs, New Mexico 88240

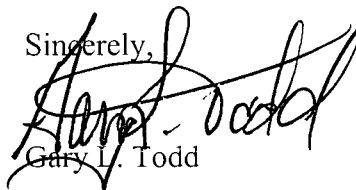
Re: OCD Form C-103  
Pawnee Deep Unit #1  
API #30-205-26557  
Section 22, T-26-S, R-36-E,  
Lea County, New Mexico

Gentlemen,

Enclosed please find OCD form C-103 on the plugging and abandonment of the referenced well for processing.

Should you have any questions regarding this issue, please contact the undersigned at (214) 526-8118.

Sincerely,



Gary L. Todd

GLT  
Enc.

HERITAGE RESOURCES, INC.  
3131 McKinney Avenue Suite 710 Dallas, Texas 75204 (214) 526-8118 Fax (214) 522-7182

**HORSE BACK #001  
(API 30-025-25354)**

**RELEVANT PLUGGING DOCUMENTS**

NO. OF COPIES RECEIVED	
DISTRIBUTION	
SANTA FE	
FILE	
U.S.G.S.	
LAND OFFICE	
OPERATOR	

NEW MEXICO OIL CONSERVATION COMMISSION  
WELL COMPLETION OR RECOMPLETION REPORT AND LOG

Form C-105  
Revised 1-1-65

5a. Indicate Type of Lease  
State  Fee

5. State Oil & Gas Lease No.  
**L6379**

7. Unit Agreement Name  
**Horse Back - Pennsylvania Gas Pool**

8. Farm or Lease Name  
**Horse Back**

9. Well No.  
**1**

10. Field and Pool, or Wildcat  
**Wildcat**

1a. TYPE OF WELL  
OIL WELL  GAS WELL  DRY  OTHER \_\_\_\_\_

b. TYPE OF COMPLETION  
NEW WELL  WORK OVER  DEEPEN  PLUG BACK  DIFF. PESVP.  OTHER **Plug & Abandon**

2. Name of Operator  
**Gifford, Mitchell & Wisenbaker**

3. Address of Operator  
**P. O. Box 7040 Midland, Texas 79703**

4. Location of Well  
UNIT LETTER **G** LOCATED **1000** FEET FROM THE **South** LINE AND **1980** FEET FROM  
THE **East** LINE OF SEC. **33** TWP. **26S** RGE. **36E** NMPM

12. County  
**Lea**

15. Date Spudded **11/16/76** 16. Date T.D. Reached **5/16/77** 17. Date Compl. (Ready to Prod.) **P/A** 18. Elevations (DF, RKB, RT, GR, etc.) **2898.70' GL** 19. Elev. Casinghead **NA**

20. Total Depth **21,750'** 21. Plug Back T.D. **11,920'** 22. If Multiple Compl., How Many **NA** 23. Intervals Drilled By Rotary Tools **0-21,750'** Cable Tools \_\_\_\_\_

24. Producing Interval(s), of this completion - Top, Bottom, Name  
**P/A**

25. Was Directional Survey Made  
**No**

26. Type Electric and Other Logs Run  
**Dual Laterlog; GR-Sonic; Dipmeter**

27. Was Well Cored  
**No**

28. CASING RECORD (Report all strings set in well)

CASING SIZE	WEIGHT LB./FT.	DEPTH SET	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
20"	94#, 133#	1,295'	26"	2283 sks	0
13-3/8"	68#, 61#	3,936'	17-1/2"	2200 sks	0
9-5/8"	47#, 53.5#	13,500'	12-1/4"	2550 sks	4400'

29. LINER RECORD

SIZE	TOP	BOTTOM	SACKS CEMENT	SCREEN
7-3/4"	13,265'	18,011'	800	

30. TUBING RECORD

SIZE	DEPTH SET	PACKER SET
2-7/8"	12,898'	12,885'
2-7/8"	11,966'	11,950'

31. Perforation Record (Interval, size and number)

(1) 12,940'--12,994'	11 holes	0.41"
(2) 12,026'--12,076'	12 holes	0.36"
(3) 9,773'-- 9,962'	28 holes	0.41"

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL	AMOUNT AND KIND MATERIAL USED
12,940'--12,994'	10,000 gal 20% HCL Acid
12,026'--12,076'	10,000 gal 20% HCL Acid
9,773'-- 9,962'	10,000 gal 15% HCL Acid

33. PRODUCTION

Date First Production \_\_\_\_\_ Production Method (Flowing, gas lift, pumping - Size and type pump) \_\_\_\_\_ Well Status (Prod. or Shut-in) **P/A**

Date of Test	Hours Tested	Choke Size	Prod'n. For Test Period	Oil - Bbl.	Gas - MCF	Water - Bbl.	Gas-Oil Ratio

Flow Tubing Press.	Casing Pressure	Calculated 24-Hour Rate	Oil - Bbl.	Gas - MCF	Water - Bbl.	Oil Gravity - API (Corr.)

34. Disposition of Gas (Sold, used for fuel, vented, etc.) \_\_\_\_\_ Test Witnessed By \_\_\_\_\_

35. List of Attachments  
**Deviation Survey**

36. I hereby certify that the information shown on both sides of this form is true and complete to the best of my knowledge and belief.

SIGNED E. K. West TITLE Drilling Consultant DATE 10/4/77





Form C-103  
Supersedes Old  
C-102 and C-103  
Effective 1-1-65

NEW MEXICO OIL CONSERVATION COMMISSION

OF COPIES RECEIVED	
DISTRIBUTION	
SANTA FE	
FILE	
U.S.G.S.	
LAND OFFICE	
OPERATOR	

5a. Indicate Type of Lease  
State  Free

5. State Oil & Gas Lease No.  
**L 6379**

**SUNDRY NOTICES AND REPORTS ON WELLS**  
(DO NOT USE THIS FORM FOR OPERATORS TO FILE OR TO FILE ON BEHALF OF A DIFFERENT RESERVOIR. USE APPLICATION FOR PERMIT TO PRODUCE OIL OR GAS FROM A DIFFERENT RESERVOIR.)

1.  OIL WELL  GAS WELL  OTHER

2. Name of Operator  
**Gifford, Mitchell & Wisenbaker**

3. Address of Operator  
**P.O. Box 7040 Midland, Texas 79703**

4. Location of Well  
UNIT LETTER **G** **1000** FEET FROM THE **South** LINE AND **1980** FEET FROM THE **East** LINE, SECTION **33** TOWNSHIP **26S** RANGE **36E** N.M.P.M.

15. Elevation (Show whether DF, RT, GR, etc.)  
**2898.7' GL**

7. Unit Agreement Name  
**Horse Back-Pennsylvania Gas Pool**

6. Farm or Lease Name  
**Horse Back**

9. Well No.  
**1**

10. Field and Pool, or Wildcat  
**wildcat**

12. County  
**Lea**

16. Check Appropriate Box To Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK <input type="checkbox"/>	PLUG AND ABANDON <input type="checkbox"/>	REMEDIAL WORK <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
TEMPORARILY ABANDON <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	COMMENCE DRILLING OPNS. <input type="checkbox"/>	PLUG AND ABANDONMENT <input checked="" type="checkbox"/>
PULL OR ALTER CASING <input type="checkbox"/>	OTHER <input type="checkbox"/>	CASING TEST AND CEMENT JOB <input type="checkbox"/>	
		OTHER _____	

17. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work) SEE RULE 1103.

Plug #1 - 21,650'-21,000' (650')- 100 sacks Class H cement & 35% silica flour & 1.4% HR-12. Halliburton - 5/21/77

Plug #2 - 19,350'-18,700' (650')-100 sacks Class H cement & 35% silica flour & 1.4% HR-12. Halliburton - 5/21/77

Plug #3 - 18,074'-17,424' (650')-100 sacks Class H cement & 35% silica flour & 1.0% HR-12. Halliburton - 5/21/77

Plug #4 - 13,265'-13,115' (150')-75 sacks Class H cement % 0.3% HR-7. Halliburton - 5/21/77

Plug #5 - 9-5/8" cast iron bridge plug set at 12,800'.

Plug #6 - 9-5/8" cast iron bridge plug set at 11,940; 20' cement plug on top of bridge plug.

Plug #7 - Cement retainer at 9650'. 200 sacks Class H cement from 9650' to 9962' (312'). Dropped 4 bbls cement on top of cement retainer. Halliburton - 10/3/77 (See additional plugs on attached sheet)

18. I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNED: EK West TITLE: Drilling Consultant DATE: 10/17/77

APPROVED BY: Eddie W Sean TITLE: OIL & GAS INSPECTOR DATE: JAN 2 1980

GIFFORD, MITCHELL & WISENBAKER

Horse Back #1

Unit Letter G, 1000' FSL & 1980' FEL  
Section 33, 26S, 36E  
Lea County, New Mexico

Page 2  
C-103

- Plug #8 - 4397'-4293' (104')-100 sacks Class C cement. Baber Well Service 10/13/77.  
Filled hole with 10 ppg mud laden fluid.
- Plug #9 - 3986'-3886' (100')-150 sacks Class C cement. Baber Well Service 10/14/77.
- Plug #10 - 1497'-1359' (138')-75 sacks Class C cement.  
Baber Well Service 10/15/77
- Plug #11 - 10'-Surface (10')-10 sacks Class C cement - Baber Well Service 10/15/77

Cut off 13-3/8" X 13-5/8" 5000# braden head. Installed New Mexico well marker.  
Filled in cellar. Removed tie downs. Work has been started toward cleaning up reserve pits.

**DOGIE DRAW FEDERAL #001  
(API 30-025-24719)**

**RELEVANT PLUGGING DOCUMENTS**

Form 9-331  
(May 1963)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE\*  
(Other instructions on  
reverse side)

Form approved.  
Budget Bureau No. 42-R1424.

5. LEASE DESIGNATION AND SERIAL NO.  
NMI8644

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME  
Dogie Draw Federal

8. FARM OR LEASE NAME  
Dogie Draw Federal

9. WELL NO.  
1

10. FIELD AND POOL, OR WILDCAT  
Wildcat

11. SEC., T., R., M., OR BLK. AND  
SURVEY OR AREA  
Sec. 8, T26S, R36E,  
NMPM

12. COUNTY OR PARISH  
Lea  
13. STATE  
New Mexico

1.

OIL WELL  GAS WELL  OTHER

2. NAME OF OPERATOR

HNG Oil Company

3. ADDRESS OF OPERATOR

P. O. Box 2267, Midland, Texas 79701

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.\*  
See also space 17 below.)  
At surface

1980' FSL & 1980' FEL, Sec. 8, T26S, R36E, NMPM

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)

2907.8'

Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

SUBSEQUENT REPORT OF:

TEST WATER SHUT-OFF

PULL OR ALTER CASING

WATER SHUT-OFF

REPAIRING WELL

FRACTURE TREAT

MULTIPLE COMPLETE

FRACTURE TREATMENT

ALTERING CASING

SHOOT OR ACIDIZE

ABANDON\*

SHOOTING OR ACIDIZING

ABANDONMENT\*

REPAIR WELL

CHANGE PLANS

(Other)

(NOTE: Report results of multiple completion on Well  
Completion or Recompletion Report and Log form.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)\*

12-19-74 to 3-13-75: Spotted 42 sks Cl H cmt from 20,313 to 19,563'. Set CIBP at 19,000'. Squeezed Fusselman perms 18,410-18,430' w/200 sks Cl H. Squeezed Fusselman perms 18,029-18,051' w/150 sks Cl H. Squeezed Devonian perms 17,248-17,260' w/150 sks Cl H. Squeezed Strawn perms 12,576-12,617' w/100 sks Cl H. Squeezed Bone Springs perms 10,646-10,655' w/200 sks Cl H. 4-24-75 - Shot 9-5/8" casing at 4300' & pulled 4280' of same.

4-26-75 - Spotted 100 sks Cl H cmt 6540' to 6820'; spotted 100 sks Cl H 4818 to 5100'; spotted 100 sks Cl H 4181 to 4317'.

4-27-75 - Spotted 100 sks Cl H 3218' to 3354'; spotted 100 sks 2536' to 2672'; spotted 100 sks Cl H 1611' to 1747'; Spotted 20 sks Cl H in top of surface and installed 4" well marker. Cleaned location.

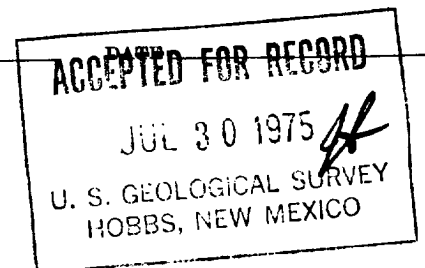
18. I hereby certify that the foregoing is true and correct

SIGNED H. G. Livingston, Jr. TITLE Petroleum Engineer DATE 5-29-75

(This space for Federal or State office use)

APPROVED BY \_\_\_\_\_ TITLE \_\_\_\_\_  
CONDITIONS OF APPROVAL, IF ANY:

\*See Instructions on Reverse Side



## **APPENDIX B**

### **IDENTIFICATION OF OPERATORS, LESSEES, SURFACE OWNERS, AND OTHER INTERESTED PARTIES WITHIN ONE MILE OF THE PROPOSED SALT CREEK AGI #2, SAMPLE NOTICE LETTER, AND SAMPLE PUBLIC NOTICE OF HEARING**

- Figure B-1: Surface owners and active operators within one mile of the proposed Salt Creek AGI #2
- Figure B-2: All leaseholders within one mile of the proposed Salt Creek AGI #2
- Table B-1: Summary list of surface owners, lessees, and mineral rights owners within one mile of the proposed Salt Creek AGI #2, who were provided notification and a complete copy of the C-108 application
- Attachment A: Sample notice letter to be sent to interested parties
- Attachment B: Sample public notice of hearing

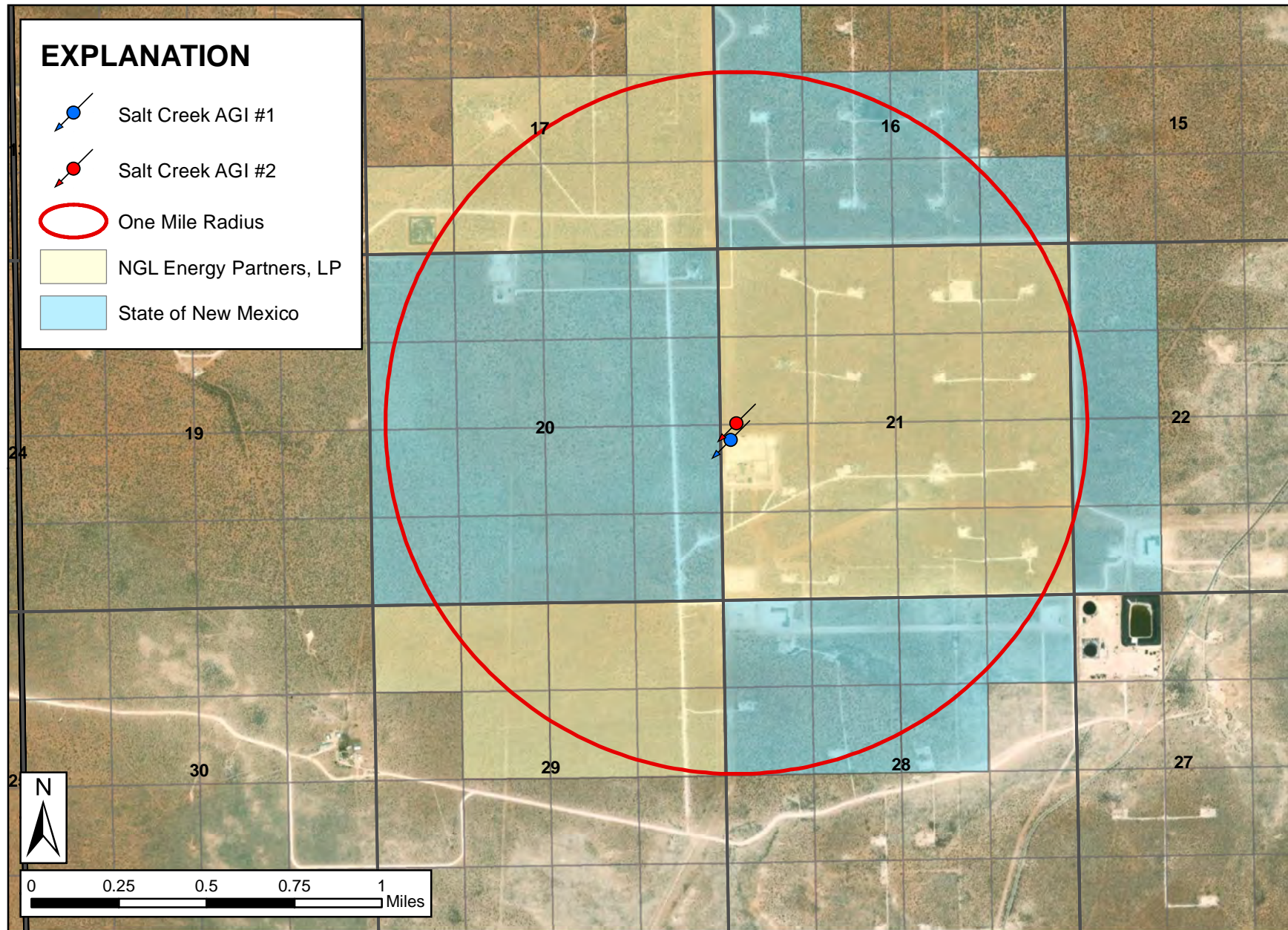


Figure B-1. Surface owners and active operators within one mile of the proposed Salt Creek AGI #2

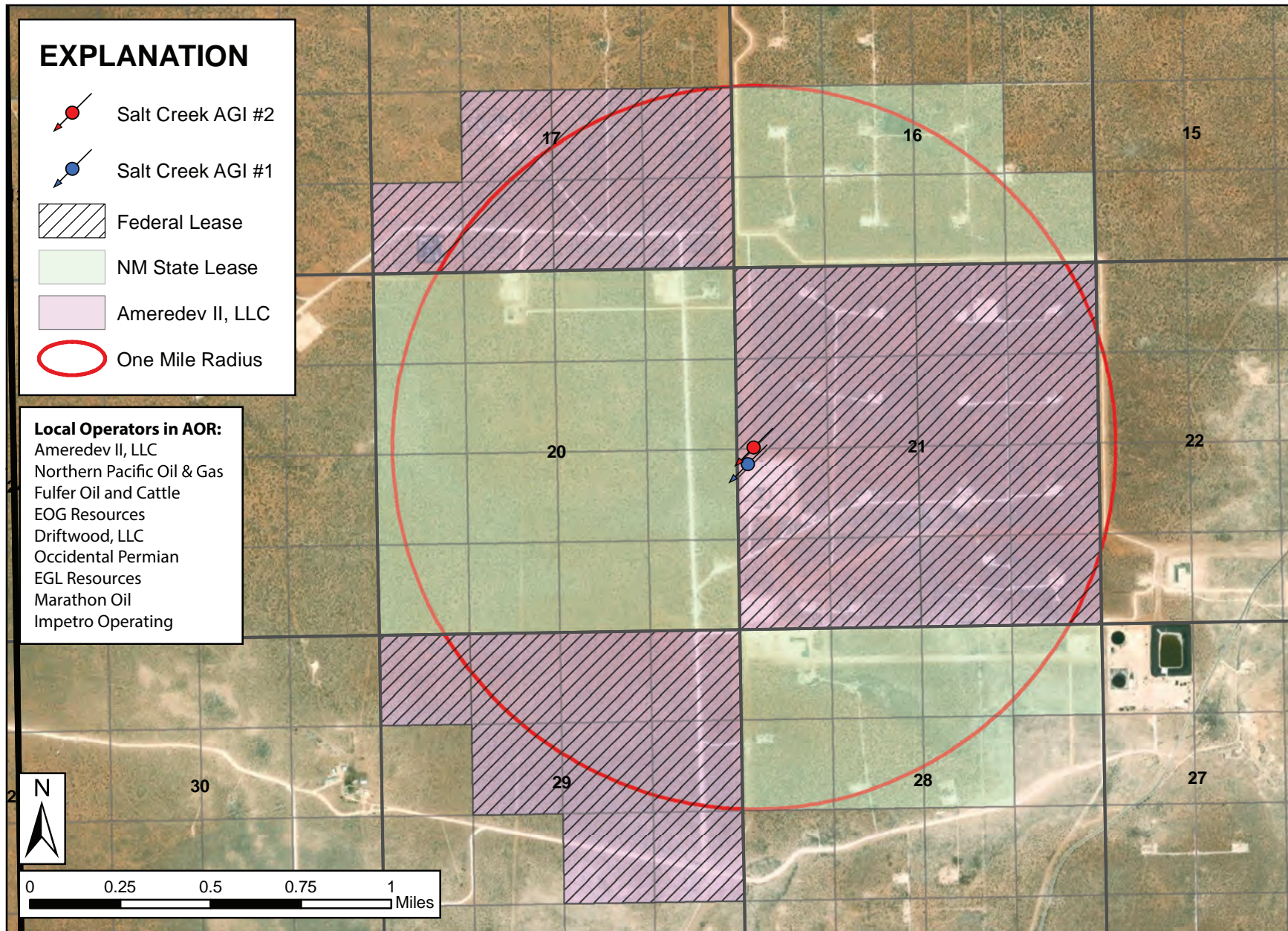


Figure B-2. Lessees, operators, and mineral ownership within one mile of the proposed Salt Creek AGI #2



**TABLE B-1. PARTIES TO BE INDIVIDUALLY NOTIFIED**

**Surface Owners:**

Ameredev Operating, LLC  
2901 Via Fortuna  
Suite 600  
Austin, TX 78746  
(737) 300-4700

NGL Energy Partners, LP  
6120 South Yale Avenue, Suite 805  
Tulsa, Oklahoma 74136  
(918) 481-1119

State of New Mexico  
P.O. Box 1148  
Santa Fe, NM 87504-1148  
(505) 827-5760

**Active Operators:**

Ameredev Operating, LLC  
2901 Via Fortuna  
Suite 600  
Austin, TX 78746  
(737) 300-4700

Driftwood Oil, LLC  
PO Box 1224  
Jal, NM 88252  
(575) 395-9970

EGL Resources  
223 West Wall Street, Suite 900  
Midland, TX 79701

EOG Resources  
1111 Bagby Street  
Sky Lobby 2  
Houston, Texas 77002

Oxy Y-1  
5 Greenway Plaza, Suite 110  
Houston, Texas 77046

Fulfer Oil & Cattle LLC  
P.O. Box 1224  
Jal, NM 88252  
(505) 935-9970

Impetro Operating, LLC  
300 East Sonterra Blvd, Suite 1220  
San Antonio, TX 78258

Marathon Oil Permian, LLC  
990 Town and Country Blvd  
Houston, TX 77024

Northern Pacific Oil and Gas Incorporated  
530-B-Harkle Road  
Santa Fe, NM 87505  
(505) 738-3809

**Additional Interested Parties (Working Interest Owners, Strangers in title, other):**

Black Rock Capital, Inc.  
2515 McKinney Avenue, Suite 900  
Dallas, Texas 75201

Bureau of Land Management  
301 Dinosaur Trail  
Santa Fe, New Mexico 87508

# **ATTACHMENT A**

Sample Notice Letter to Be Sent to Interested Parties

**ATTACHMENT A – SAMPLE NOTICE LETTER**

October XX, 2023

Example Notice Letter  
Party to be notified  
Address

VIA CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

RE: NORTHWIND MIDSTREAM, LLC PROPOSED SALT CREEK AGI #2

This letter is to advise you that Northwind Midstream, LLC (Northwind) intends to file the enclosed C-108 application (Application for Authorization to Inject) with the New Mexico Oil Conservation Division seeking authorization to drill and operate an acid gas injection (AGI) well, the Salt Creek AGI #2 well, at their gas processing facility (the “Facility”) in Lea County, New Mexico. The proposed Salt Creek AGI #2 is intended to provide a redundant well option for existing acid gas injection operations and increase the total sour gas treatment capacity at the Facility.

The proposed redundant well (Salt Creek AGI #2) will be a vertical well with a surface location of approximately 2,665 feet from the south line (FSL) and 245 feet from the west line (FWL) in Section 21, Township 26 South, Range 36 East, in Lea County, New Mexico. As proposed, the Salt Creek AGI #2 well will inject waste carbon dioxide and hydrogen sulfide into the Devonian through Fusselman geologic formations from approximately 17,550 feet to 18,650 feet. The maximum allowable surface pressure will not exceed 5,798 psig with a maximum daily injection volume of twelve (12) million standard cubic feet (MMSCF).

In accordance with application requirements of the New Mexico Oil Conservation Division, you are being provided this notice and a copy of the complete application as you are an interested party within one (1) mile of the proposed AGI well location. Interested parties must file any objections or requests for hearing of administrative applications within fifteen (15) days from the date in which this application was mailed to them. These requests should be submitted to the New Mexico Oil Conservation Division; 1220 South St. Francis Drive; Santa Fe, New Mexico 87505.

If you have any questions concerning this application, you may contact Alberto A. Gutiérrez or David White at Geolex, Inc.<sup>®</sup>; 500 Marquette Avenue NW, Suite 1350; Albuquerque, New Mexico 87102; (505) 842-8000.

Sincerely,  
Geolex, Inc.<sup>®</sup>

Alberto A. Gutiérrez, C.P.G.  
President  
Consultant to Northwind Midstream

Enclosure: C-108 Application for Authority to Inject

# **ATTACHMENT B**

Sample Public Notice of Hearing

## **ATTACHMENT B – SAMPLE PUBLIC NOTICE OF HEARING**

Northwind Midstream, LLC; 825 Town and Country Ln.; Building 5, Suite 700; Houston, Texas 77024, filed Form C-108 (Application for Authorization to Inject) on XX/XX/2022, with the New Mexico Oil Conservation Division seeking authorization to drill, complete, and operate its proposed acid gas injection (AGI) well, Salt Creek AGI #2. The well will be a vertical well, located at approximately 2,665 feet FSL, 245 feet FWL in Section 21, T26S, R36E in Lea County, New Mexico, approximately seven miles west of Jal, New Mexico. Salt Creek plans to inject up to 12 million standard cubic feet (MMSCF) per day of treated acid gas at a maximum pressure of 5,798 psig into the Devonian to Fusselman formations through an open hole completion between approximately 17,550 feet and a total depth of approximately 18,650 feet.

This application (Case Number XXXXX) has been set for hearing before the New Mexico Oil Conservation Commission at XX:XX a.m. on XX/XX/2022, in the Wendell Chino Building at the New Mexico Oil Conservation Division's Santa Fe office located at 1220 South Saint Francis Drive, Santa Fe, New Mexico 87505. Interested parties that may be affected by Salt Creek's application may appear and present testimony by filing a Pre-Hearing Statement with the Division's Santa Fe office at the above-specified address at least four days in advance of the scheduled hearing date. Additional information can be obtained from the applicant's agent, Geolex, Inc.®; 500 Marquette Avenue NW; Suite 1350; Albuquerque, New Mexico 87102; (505)842-8000.

## **APPENDIX C**

**REQUEST LETTERS FOR PERMISSION TO SAMPLE  
AND ANALYZE GROUNDWATER AND PROOF OF  
MAILING**



Alberto A. Gutiérrez, C.P.G.

October 11, 2022

VIA CERTIFIED MAIL

NGL South Ranch, Inc.  
Attn: Jim Winter  
3773 Cherry Creek N. Drive #1000  
Denver, CO 80209

RE: WATER WELL (CP 00025 POD1) STATUS INQUIRY AND REQUEST FOR  
GROUNDWATER SAMPLE

To Whom it May Concern:

On behalf of Salt Creek Midstream, LLC, we (Geolex, Inc.®) are contacting you in the hopes that you may provide us with more information regarding the current operational status of a water well in which you are documented as the owner of record. If the current state of the well permits, we respectfully request permission to collect and analyze a groundwater sample from this well.

As recorded in the files of the New Mexico Office of the State Engineer, the well file number is CP 00025 POD 1 and the well has a recorded location within the NE/4 of the NE/4 of Section 29, Township 26 South, Range 36 East. The approximate coordinates are 32.02091, -103.27991 (NAD83).

Salt Creek Midstream, LLC is requesting permission to sample and analyze groundwater from this well in order to provide the New Mexico Oil Conservation District with required groundwater data in the area of their proposed Class II injection well, the Salt Creek AGI #2. The proposed well is to be located in the NW/4 of the SW/4 Section 21 of Township 26 South, Range 36 East.

If you have any questions concerning this inquiry or would like to further discuss our request, you may contact Alberto Gutiérrez P. G., or David White, P.G. at (505) 842-8000 at Geolex, Inc.®; 500 Marquette Avenue NW, Suite 1350, Albuquerque, New Mexico.

Sincerely,  
Geolex, Inc.®

David A. White, P.G.  
Vice President – Consultant to Salt Creek Midstream

Z:\22-032 SCM Devonian (was 5Point)\Reports\C-108\Appendices\Appendix C\10\_11\_22\_GW request letter (NGL).docx





Alberto A. Gutiérrez, C.P.G.

October 11, 2022

VIA CERTIFIED MAIL

NGL South Ranch, Inc.  
6120 South Yale Avenue, #805  
Tulsa, OK 74136

RE: WATER WELL (CP 00025 POD1) STATUS INQUIRY AND REQUEST FOR  
GROUNDWATER SAMPLE

To Whom it May Concern:

On behalf of Salt Creek Midstream, LLC, we (Geolex, Inc.®) are contacting you in the hopes that you may provide us with more information regarding the current operational status of a water well in which you are documented as the owner of record. If the current state of the well permits, we respectfully request permission to collect and analyze a groundwater sample from this well.

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Sincerely,  
Geolex, Inc.®

David A. White, P.G.  
Vice President – Consultant to Salt Creek Midstream

Z:\22-032 SCM Devonian (was 5Point)\Reports\C-108\Appendices\Appendix C\10\_11\_22\_GW request letter (NGL).docx

phone: 505-842-8000  
fax: 505-842-7380

500 Marquette Avenue NW, Suite 1350  
Albuquerque, New Mexico 87102

email: aag@geolex.com  
web: www.geolex.com

7016 1970 0000 8251 0067

**U.S. Postal Service™**  
**CERTIFIED MAIL® RECEIPT**  
 Domestic Mail Only

For delivery information, visit our website at [www.usps.com](http://www.usps.com)®.

Tulsa, OK 74136

Certified Mail Fee	\$4.00
Extra Services & Fees (check box, add fee as appropriate)	\$3.25
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$0.60
<b>Total Postage and Fees</b>	<b>\$7.85</b>

Postmark Here: **OCT 11 2022**  
 USPS  
 10/11/2022  
 (22-032)

Sent To: **NGL SOUTH RANCH INC.**  
 Street and Apt. No., or PO Box No.: **6120 SOUTH VALE AVE # 805**  
 City, State, ZIP+4®: **TULSA, OK 74136**

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7016 1970 0000 8251 0074

**U.S. Postal Service™**  
**CERTIFIED MAIL® RECEIPT**  
 Domestic Mail Only

For delivery information, visit our website at [www.usps.com](http://www.usps.com)®.

Denver, CO 80209

Certified Mail Fee	\$4.00
Extra Services & Fees (check box, add fee as appropriate)	\$3.25
<input type="checkbox"/> Return Receipt (hardcopy)	\$0.00
<input type="checkbox"/> Return Receipt (electronic)	\$0.00
<input type="checkbox"/> Certified Mail Restricted Delivery	\$0.00
<input type="checkbox"/> Adult Signature Required	\$0.00
<input type="checkbox"/> Adult Signature Restricted Delivery	\$0.00
Postage	\$0.60
<b>Total Postage and Fees</b>	<b>\$7.85</b>

Postmark Here: **OCT 11 2022**  
 USPS  
 10/11/2022  
 (22-032)

Sent To: **NGL SOUTH RANCH INC. ATTN: JIM WINTER**  
 Street and Apt. No., or PO Box No.: **3773 CHERRY CREEK N. DRIVE #1000**  
 City, State, ZIP+4®: **DENVER, CO 80209**

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions