Initial Application Part I

Received 11/4/21

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

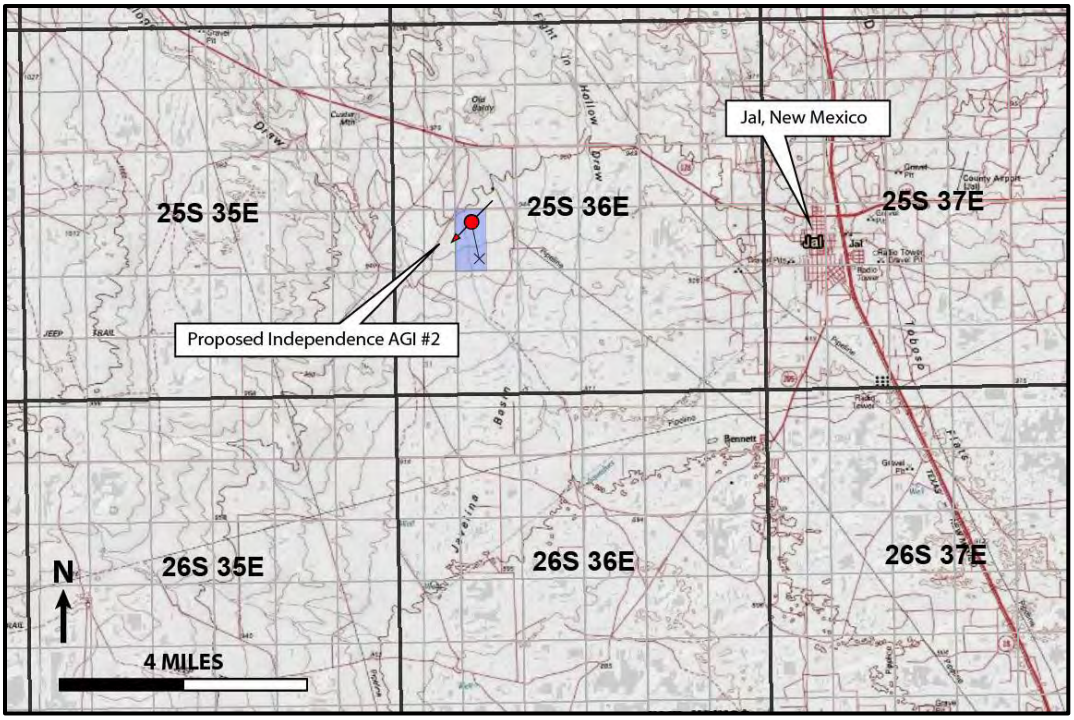
APPLICATION FOR CLASS II AGI WELL
PINON MIDSTREAM

INDEPENDENCE AGI #2

Surface Location: 1,180' FNL & 1,578' FWL, Section 20, T25S, R36E
Bottom-Hole Location: 2,132 FWL & 1,033 FSL, Section 20, T25S, R36E
Lea County, New Mexico

Surface Hole Latitude (NAD83): 32.120020
Surface Hole Longitude (NAD83): -103.291015

Bottom-Hole Latitude (NAD83): 32.111581
Bottom-Hole Longitude (NAD83): -103.289273



November, 2021

Prepared For:

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OM8RD-211104-C-1080 AGI pBL2130931001

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

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

FORM C-108
Revised June 10, 2003

APPLICATION FOR AUTHORIZATION TO INJECT

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

II. OPERATOR: PIÑON MIDSTREAM

ADDRESS: 20445 SH 249, SUITE 300, HOUSTON, TEXAS 77070

CONTACT PARTY: STEVEN GREEN PHONE: (713) 300-9300

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.

SWD-2464

IV. Is this an expansion of an existing project? _X_ Yes ___ No
If yes, give the Division order number authorizing the project: **R-21455-A**

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. **SECTIONS 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. **NOT APPLICABLE**

*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 7.0**

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: ALBERTO A. GUTIÉRREZ TITLE: PRESIDENT - GEOLEX, INC. CONSULTANT TO PIÑON MIDSTREAM

SIGNATURE:  DATE: 11/1/2021

E-MAIL ADDRESS: AAG@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

III. WELL DATA

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

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

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

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

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

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

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

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

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

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

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

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

XIV. PROOF OF NOTICE

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

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

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

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

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

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

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

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

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1.0 EXECUTIVE SUMMARY

On behalf of Piñon Midstream, LLC (Piñon), Geolex, Inc.® (Geolex) has prepared and is hereby submitting a complete C-108 application for approval to drill, complete, and operate a redundant acid gas (CO_2 and H_2S) injection well in Section 20, Township 25 South, Range 36 East (32.120020, -103.291015 NAD83), approximately six miles west of Jal in Lea County, New Mexico (Figure 1). The Independence AGI #2 well is intended to provide a simultaneous and redundant acid gas injection well option for the Dark Horse Gas Treatment Facility, which currently operates with a single acid gas injection well, the Independence AGI #1, which was put in service on August 21, 2021.

The proposed Independence AGI #2 is designed to provide operational efficiency and redundancy and to accommodate the anticipated disposal needs of the Piñon Midstream Dark Horse Gas Treatment Plant (Dark Horse), which needs to safely inject up to a maximum of twenty (20) million standard cubic feet (MMSCF) per day (approximately 8,530 barrels per day) of treated acid gas (TAG) between two (2) injection wells for at least 30 years. The TAG stream is anticipated to consist of approximately 70% carbon dioxide (CO_2) and 30% hydrogen sulfide (H_2S) with trace components of hydrocarbons ($C_1 – C_7$). When operating at full capacity, The AGI system (Independence AGI #1 and # 2) will permanently sequester approximately 858 tons of CO_2 and approximately 285 tons of H_2S per day.

Independence AGI #2 will be drilled as a deviated well with a surface-hole location (SHL) of approximately 1,180 feet from the north line (FNL) and 1,578 feet from the west line (FWL) of Section 20. The bottom-hole location (BHL) is to be located 1,033 feet from the south line (FSL) and 2,132 feet FWL of Section 20, approximately 3,100 feet from the SHL (Figure 2). The well will be constructed utilizing a five-string design and all casing strings will be cemented to the surface. The integrity of cementing operations will be verified by way of visual inspection, as well as collection of cement bond logs for all casing strings. The production casing and injection tubing will utilize approximately 300 feet of corrosion-resistant alloy in order to protect the well and lower well components from potentially corrosive conditions.

The proposed open-hole injection zone will target the same reservoir as AGI #1 (the Devonian Thirty-One and Upper Silurian Wristen and Fusselman formations) at depths of approximately 16,080 feet to 17,683 feet TVD. Analysis of these geologic units confirms that they act as excellent closed-system reservoirs that will accommodate the future needs of Piñon for the disposal of acid gas and sequestration of CO_2 from the existing gas treatment facility.

In the area of Independence AGI #2, the proposed injection interval is overlain by a thick interval of dense Woodford Shale (approximately 335 feet) and an additional 796 feet of low-porosity, low-permeability Mississippian carbonates of the Osage and Barnett formations. These units, in total, will provide at least 1,131 feet of excellent caprock that will contain and prevent the upward migration of injected TAG. Additionally, low-porosity intervals of the lower Montoya Formation underlying the targeted injection zone will prevent the downward migration of TAG and protect underlying strata.

The requested maximum allowable operating pressure (MAOP) for Independence AGI #2 is approximately 5,005 psig, which was determined utilizing calculation methods approved by NMOCD which are based on the final specific gravity of the injection stream. At the anticipated average reservoir conditions of 228 °F and 7,370 psig, each MMSCF of TAG will occupy a volume of approximately 2,226 cubic feet (397 barrels). Based on temperature and pressure data collected while drilling and completing the Independence AGI #1, the specific gravity of injectate, under average injection reservoir conditions, is calculated to be approximately 0.78.

Injection simulations were completed to evaluate the impact operation of the proposed Independence AGI #2 would have on the target Siluro-Devonian reservoir over the life of the AGI well. These simulations were completed in collaboration with Sproule utilizing Schlumberger Petrel and Eclipse platforms to construct a geologic simulation grid and simulate acid gas injection, respectively. The pressure modeling conducted for the AGI #1 permit application was updated using data obtained during drilling and testing of AGI #1, which results in the simulation presented herein. After 30 years of operation at the maximum anticipated injection rate of 20 MMSCF per day, coincident with injection by the nearest SWD, the resultant acid gas plume is predicted to extend a maximum of 3.1 miles from the proposed AGI wellbore BHL when including all non-zero concentrations. The maximum potential saturation level observed in all cases is approximately 65% limited to the immediate area of the AGI wellbore.

In total, there are 12 wells within the one-mile radius of the proposed Independence AGI #2, which includes Independence AGI #1. Specific well data are summarized in Appendix A along with relevant plugging documents. Of these wells, eight (8) are active or permitted and four (4) are plugged. Within one mile of the proposed AGI, the injection zone is penetrated by two (2) active disposal wells: West Jal B Deep #1; API #30-025-25046 and Independence AGI #1: API #30-025-48081. The West Jal B Deep #1 is permitted to inject across an interval of Strawn through Fusselman formations and the Independence AGI #1 is permitted to inject into the Devonian through Fusselman formations. One plugged well (West Jal Unit #1; API #30-025-21172) is fully cemented through the proposed injection zone and its current condition is such that it will not be negatively affected by the proposed injection scenario and operation of the proposed Independence AGI #2.

The area surrounding the proposed injection site is arid and there are no natural bodies of water within several miles of the plant. A review of the New Mexico Office of the State Engineer's files shows a total of 15 points of diversion within two miles of the proposed AGI. Within one mile of the proposed AGI, there are two water wells, the closest of which is located approximately 0.34 miles away and has a total depth of 505 feet. All wells within a one-mile radius are shallow and will be protected via the proposed Independence AGI #2 casing and cementing design, which includes a surface casing interval extending to 1,230 feet that will isolate and protect 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 injection. These elements include:

- Identification and characterization of all hydrocarbon-producing zones of wells that surround and are present on the plant site
- The depths of perforated pay intervals in those wells relative to the depth of the target injection zone (Devonian, Wristen, and Fusselman formations)
- The past and current uses of the proposed intervals
- 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 all surface owners, lessees, and other interested parties within a one-mile radius of the proposed injection well and a sample notification letter with which they will be provided (Copies of all notification letters are provided as an attachment to this application)
- 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

- Reservoir injection simulations to evaluate the resultant effects of injection operations in the area and provide a basic prediction of the resultant acid gas dispersion plume that can be updated as injection continues

- An analysis evaluating the potential for induced-seismic events in response to the proposed injection scenario that includes detailed seismic review and mapping in the area of the proposed well

- 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 allow for communication of the disposal zone with any known sources of drinking water

Based upon this detailed evaluation, Piñon and Geolex have 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 well will not negatively affect water resources, 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 C-108 APPLICATION

The completed New Mexico Oil Conservation Division (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 the information required by NMOCD to evaluate and administratively 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 acid gas characteristics and modeling simulation results to predict and provide a basis for evaluating the resultant acid gas plume and resultant reservoir pressure effects resulting 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)
- An evaluation of the potential for induced-seismic events in response to proposed and ongoing injection operations in the area of the proposed AGI (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 are no hydraulic connections 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 and maps 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 and associated plugging documents for wells within one mile
- **Appendix B**: Tables and maps summarizing the operators, lessees, and surface owners in the one-mile radius area of review, as well as copies of all notification letters sent to interested parties, proof of delivery, public newspaper notice, and the associated affidavit of publication.
- **Appendix C**: Preliminary drilling-fluid program generated by Valence Drilling Fluids, LLC for the proposed Independence AGI #2 well

3.0 PROPOSED CONSTRUCTION AND OPERATION OF INDEPENDENCE AGI #2

The Independence AGI #2 surface location (SHL) will be drilled at approximately 1,180 feet from the north line (FNL) and 1,578 feet from the west line (FWL) of Section 20, approximately 378 feet south-southeast of Independence AGI #1 and will contain a deviated wellbore placing the bottom hole location (BHL) approximately 3,100 feet south-southeast from the surface hole location (Figure 2). TAG to be injected will be routed from Dark Horse to on-site compression facilities that will compress the acid gas into a dense phase (roughly 1,250 psig), allowing water to be removed. The compressed TAG will then be routed to the wellhead and pumped to injection pressure through NACE-rated (National Association of Corrosion Engineers) pipeline suitable for injection. Design details are provided in the following sections 3.1 and 3.2.

3.1 DESIGN OF INDEPENDENCE AGI #2

The location of the proposed AGI well and the extent of Piñon surface lands where Dark Horse is constructed, are shown in Figure 2, and a general schematic of the injection system is shown in Figure 3. The Independence AGI #2 will be drilled as a deviated well to an anticipated total measured depth (MD) of 18,080 feet (17,683 feet TVD) to the base of the Fusselman formation. The injection zone (approximately 16,080 to 17,683 feet TVD) will be completed as an open-hole interval that includes the Devonian Thirty-one, upper Silurian Wristen and Fusselman, formations.

The AGI plant and injection wells are integrated components of the Dark Horse facility design. The proposed well schematic for the Independence AGI #2 (Figure 4) is similar in design to Independence AGI #1, incorporating all previous NMOCD guidance regarding design expectations for the Independence AGI #1 well. The proposed Independence AGI #2 has been designed such that the two-well AGI system can accommodate the injection of up to 20 MMSCF per day of TAG for a design life of 30 years.

Independence AGI #2 will utilize a five-string casing design (Figure 4). Surface casing (24-inch) will be set in competent strata above the Salado Salt at approximately 1,230 feet TVD/MD. The first intermediate casing (20-inch) will be set through the salt to approximately 3,500 feet TVD/MD within the Yates Formation. The second intermediate 13.625-inch casing will be advanced to approximately 7,200 feet MD (7,058 feet TVD) and will be set into the Brushy Canyon Formation, isolating the Capitan Reef through the deployment of two external casing packers (ECP). The third intermediate casing will be 9.625 inches and will be set in the Atoka Formation at approximately 13,650 feet MD (13,320 feet TVD), protecting active and planned production in the Bone Springs and Wolfcamp formations utilizing an ECP. The production casing (7-inch) will be set in a competent geologic unit in the Devonian Thirty-one Formation at an approximate depth of 16,477 feet MD (16,080 feet TVD) and will also consist of an ECP. The final completion will be constructed as a 5.875-inch, open-hole interval to a total depth of approximately 18,080 feet MD (17,683 feet TVD).

As shown in figures 3 and 4, the Independence 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.

Design and material considerations for Independence AGI #2 include: 1) Placement of the subsurface safety valve (SSSV) and permanent injection packer; 2) installation of sufficient casing strings to isolate and protect groundwater resources (Ogallala and Santa Rosa formation groundwater, Rustler Formation

saline groundwater, and the Capitan Reef groundwater) and active producing zones; 3) characterization of the injection zone; and 4) a total depth (TD) ensuring accurate identification and penetration of the target reservoir.

A suitable drilling rig will be chosen for the job that will include an appropriate blowout preventer and choke-manifold system for any unforeseen pressure conditions encountered. Visual inspections of cement returns to the surface will be noted in all casing operations. Casing and cement integrity will be demonstrated by pressure testing and 360-degree cement bond logs recorded for each cement operation. The five casing strings shown in Figure 4 are summarized in the following Table 1.

Table 1. Independence AGI #2 proposed casing schedule

Casing	Hole Size (in.)	Csg. Size (in.)	Pounds Per Foot	Grade	Thread	Top (ft., MD)	Bottom (ft., MD)	Length (ft., MD)	Length (ft., TVD)
Proposed Casing									
Conductor	36	30.0	118	-	Welded	0	122	122	122
Surface	26	24.0	186.4	X-65	XLF	0	1230	1230	1230
1st Intermediate	22	20.0	133	NT-80DE	GB Butt 21	0	3500	3500	3500
2nd Intermediate	17.5	13.625	88.2	Q-125HC	BTC	0	7200	7200	7058
3rd Intermediate	12.25	9.625	47	L-80HC	BTC	0	9000	9000	8824
3rd Intermediate	12.25	9.625	47	P-110HP	BTC	9000	13650	4650	4496
Production	8.5	7	32	P-110HC	Var. SC	0	16177	16177	15780
Production	8.5	7	32	G3 (CRA)	VAM	16177	16477	300	300
Proposed Tubing									
Inj. Tubing	N/A	3.5	9.2	L-80HC	VAM	0	16127	16127	15730
Inj. Tubing (CRA)	N/A	3.5	9.2	G3 (CRA)	VAM	16127	16427	300	300

Operations to drill Independence AGI #2 will utilize a closed-loop system to manage drilling fluids. Appendix C includes a preliminary drilling fluids program prepared by Valence Drilling Fluids, LLC that outlines the anticipated mud program for the well. All casing strings will be cemented to the surface using appropriate conventional cement and methods. Pressure testing will be completed, and 360-degree cement bond logs will be recorded in order to verify the integrity of all cementing operations.

The 7-inch production casing will be set in a competent bed within the Devonian Thirty-one Formation at approximately 16,477 feet MD 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 13,900 feet MD. 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 resin cement (or equivalent), which is specially designed for use in such conditions.

The following table summarizes the preliminary cement program for all proposed Independence AGI #2 casing strings.

Table 2. Independence AGI #2 proposed cementing plan

Casing String	Stage #	Cement Type	# Sacks	Density (#/gallon)	Coverage Interval (MD)
Conductor	1	Redimix	-	-	0' – 122'
Surface	1	Lead: HalCem Tail: HalCem	Lead: 646 Tail: 347	Lead: 13.5 Tail: 14.8	0' – 1,230'
1st Intermediate	1	Lead: HalCem Tail: HalCem	Lead: 1,657 Tail: 207	Lead: 13.5 Tail: 14.8	0' – 3,500'
2nd Intermediate	1	Tail: VersaCem H	Tail: 1,198	Tail: 14.5	5,405' – 7,200'
	2	Lead: NeoCem IL2 Tail: VersaCem H	Lead: 486 Tail: 200	Lead: 11.5 Tail: 14.5	3,750' – 5,405'
	3	Lead: EconoCem HLC Tail: HalCem C	Lead: 1,497 Tail: 200	Lead: 12.5 Tail: 14.5	0' – 3,750'
3rd Intermediate	1	Lead: NeoCem PL2 Tail: VersaCem H	Lead: 1035 Tail: 332	Lead: 11.5 Tail: 14.5	7,300' – 13,650'
	2	Lead: EconoCem HLC Tail: VersaCem H	Lead: 2,586 Tail: 154	Lead: 12.5 Tail: 14.5	0' – 7,300'
Production	1	Lead: NeoCem PT2 Tail: LockCem	Lead: 44 Tail: 44	Lead: 13.2 Tail: 15.3	13,900' – 16,477'
	2	Tail: NeoCem PT	Tail: 1,704	Lead: 13.2	0'-13,900'

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. Section 3.3 addresses how those data will be utilized and supplemented in the event of down-hole sensor failure.

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.

NACE issues guidelines for metals exposed to various corrosive gases like those anticipated for this well. For a H_2S-CO_2 stream of acid gas that is dewatered at the surface via successive stages of compression, down-hole components, such as the SSSV and packer need to be constructed of Inconel 925 (or equivalent). The CRA joints utilized in Independence 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 string from 13,650 feet MD (13,320 feet TVD) to 16,477 feet MD (16,080 feet TVD) and within the open-hole injection interval from 16,477 feet MD (16,080 feet TVD) to 18,080 feet MD (17,683 feet TVD). Due to the close proximity to Independence AGI #1 (approximately 378 feet), no shallow geophysical logging (excluding gamma ray from MWD) are planned, as these intervals were logged in detail for the AGI #1 location. The proposed open-hole logging suite for deeper geologic section 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 overlying material to properly sequester the injected TAG. Porosity and permeability characteristics of the proposed injection zone and overlying caprock material may be verified through collection and analysis of sidewall cores if needed.

3.3 RESERVOIR STIMULATION, TESTING, AND PRESSURE MONITORING

Upon the completion of geophysical logging for Independence 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 injection zone for approximately 24 hours. Subsequently, a complete acid stimulation job consisting of approximately 32,000 gallons of 15% hydrochloric acid (HCl) and approximately 8,000 gallons of gelled 15% HCl acid will be injection into the reservoir to open potential reservoir-bound fractures and secondary porosity zones.

In addition to stimulation operations, an injection step-rate test (SRT) will be completed for Independence AGI #2. A temporary string containing a removable packer and tubing will be run to conduct the test and determine the final injection pressure and volumes to ensure the formation parting pressure (fracture pressure) is not exceeded during acid gas injection operations. Once the reservoir has been tested and safe operational conditions have been identified, the final 3.5-inch tubing string and permanent injection packer will be run in and set at an approximate depth of 16,397 feet MD.

The Independence 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 on a mandrel immediately overlying 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 predicted reservoir performance (discussed in sections 3.4 and 3.5) 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 reservoir evaluation, which will be performed periodically during the lifetime of the well. Additionally, the bottom-hole monitoring equipment for AGI #1 may act as a redundant monitoring system, should a failure occur in the bottom-hole monitoring equipment of Independence AGI #2.

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 10-day reservoir pressure fall-off test to provide baseline conditions prior to the commencement 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 integrity issues in the well

4. Monitor bottom-hole pressure/temperature with a sensor and transmitter 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 drop, 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 well will be designed and 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_2) 70%
- Hydrogen Sulfide (H_2S) 30%
- Trace Nitrogen and C_1-C_7 Less than 1%

The maximum total volume of TAG to be injected daily by the two-well system will be approximately 20 MMSCF per day. Pressure reduction valves and controls will be incorporated to assure that maximum surface injection pressure approved 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 Independence AGI #2 using the AQUAlibrium™ 3.1 software, which employs the modified PR EOS model (Table 3).

The proposed and modeled maximum daily injection rate of 20 MMSCF per day is composed of 70 mol% CO_2 and 30 mol% H_2S. Specific gravities of TAG were determined for these mixtures at the wellhead (2,200 psig, 115 ºF), the bottom of the injection interval of the well (7,720 psig, 235 ºF), and under average reservoir conditions (7,370 psig, 228 ºF) (Table 3).

To determine the proposed maximum surface injection pressure, we utilize the following NMOCD-approved method, which is based on the final specific gravity of the injection stream. Utilizing this method and reservoir temperature and pressure data collected while drilling Independence AGI #1, we propose a maximum allowable operating pressure (MAOP) of approximately 5,005 psig as determined in the calculations that follow:

MAXIMUM ALLOWABLE OPERATING PRESSURE (MAOP) DETERMINATION

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

WHERE: IP_{Max} = Maximum Surface Injection Pressure (psig)
PG = Pressure Gradient of Injection Fluid (psig/ft)
D_{Top} = Depth at top of injection zone

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 = 0.76, and SG_{TAG} at bottom = 0.80; see Table 3)

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

$$SG_{TAG} = 0.78\ (Estimate\ at\ Reservoir\ Midpoint)$$

AND

$$D_{Top} = 16{,}080\ feet\ TVD$$

THEREFORE

$$PG = 0.2 + 0.433(1.04 - 0.78)$$

$$PG = 0.311\frac{psig}{ft}$$

AND

$$IP_{Max} = 0.311\frac{psig}{ft} x\ 16{,}080\ feet$$

$$\boldsymbol{IP_{Max} = 5{,}005\ psig}$$

For this reason, Piñon requests approval for a surface injection MAOP of 5,005 psig for the proposed Independence AGI #2.

Table 3. Anticipated TAG stream characteristics at wellhead, bottom of well, and in reservoir at equilibrium

Proposed Injection Stream Characteristics

TAG	H_2S	CO_2	H_2S	CO_2	TAG
Gas Volume (MMSCFD)	Conc. mol %	Conc. mol %	Injection Rate lbs/day	Injection Rate lbs/day	Injection rate lbs/day
20	30	70	569536	1716069	2285605

Conditions at Wellhead

Wellhead		TAG							
Temp F	Pressure psig	Gas Vol (MMSCFD)	Comp CO_2:H_2S	Inject Rate lbs/day	Density kg/m^3	SG	Density lbs/gal	Volume ft^3	Volume bbl
115	2200	20	70:30	2285605	764.09	0.76	6.38	47893	8530

Conditions at Bottom of Well

Wellhead		TAG							
Temp F	Pressure psig	$Depth_{Top}$ ft	$Depth_{Bot}$ ft	Thickness ft	Density kg/m^3	SG	Density lbs/gal	Volume ft^3	Volume bbl
235	7720	16080	17684	1604	802.02	0.80	6.70	45628	8127

Conditions in Reservoir at Equilibrium

Wellhead		TAG							
Temp F	Pressure psig	Avg. Porosity	S_{WR}	Porosity (ft)	Density kg/m^3	SG	Density lbs/gal	Volume ft^3	Volume bbl
228	7370	3.9	0.14	53.79816	821.80	0.82	6.86	44529	7931

3.5 ACID GAS INJECTION PLUME MODELING

To evaluate the impact of operation of the proposed Independence AGI #2 on the target Siluro-Devonian reservoir, Geolex directed Sproule in modifying the original AGI #1 reservoir model with data obtained during drilling and testing of AGI #1. This detailed reservoir evaluation and injection modeling assessment was inclusive of parameters from a previous model completed for AGI #1 and the new data. Components of this evaluation included: 1) Review and incorporation of newly available subsurface data (e.g., geophysical logs, drill-stem and injection tests, 3D seismic survey data) to identify and estimate reservoir characteristics in the area of the proposed AGI well location, and 2) construction/revision of a geologic simulation grid and injection modeling utilizing Schlumberger Petrel and Eclipse platforms, respectively.

3.5.1 Siluro-Devonian Reservoir Evaluation

Upon review of available subsurface data, including those of AGI #1, eight 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 AGI #2

Zone	Zone Thickness	Φ Type	Φ*Thickness	Avg. Φ	Φ Range	Avg. K (mD)
1	64	SEP + SEF	5.12	8.0%	6-10%	14.3
2	200	FX	4.0	2.0%	1-3%	1.3
3-6	923	Small FX	18.46	2.0%	1-4%	2.1 – 19
7	262	SEP + SEF	23.58	9.0%	4-14%	3.9
8	214	SEP + SEF	19.26	9.0%	4-14%	11.3

Generally, average porosity values within each identified zone range from approximately 1% to 8% and the total proposed Siluro-Devonian injection interval exhibits an average porosity of 3.9%. Average permeability values were estimated from nearby porosity logs and were informed by the AGI #1 injection tests 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 of the 2-well system (20 MMSCF per day), Geolex collaborated with Sproule to revise and update the AGI #1 reservoir injection simulation. This modeling evaluation was completed utilizing Schlumberger Petrel to construct/update a geologic simulation grid informed by the previously described reservoir evaluation and available well data in the area of Independence 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 eight distinct intervals identified within the proposed injection reservoir. The simulation model area covers approximately 20 square miles and includes nearby subsurface features and relevant nearby injection wells (Figure 5). 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 (Including those of AGI #1), 3D seismic survey impedance data, and reservoir characteristics identified during the evaluation discussed in Section 3.5.1. From AGI #1 well data (as well as from West Jal B Deep #1 and West Jal Unit #1) and a synthetic DPHI log generated for the proposed Independence AGI #2 location (up-scaled to reflect enhanced porosity identified in review 3D seismic survey impedance data), a model distribution for porosity, and subsequently permeability, was generated (Figure 6). 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.

As only three wells located in the area of Independence AGI #2 have available log data to be utilized in defining model porosity characteristics, 3D seismic survey impedance data were utilized to define key areas of low or high porosity areas within the simulation grid. This was accomplished by implementing five pseudo-well control points, including the proposed AGI #2 (Figure 7), which would allow the injection simulation to evaluate low and high porosity regions within the model environment without altering porosity values across the total area of the model. Also included in Figure 7 are model-generated porosity distribution maps of key intervals identified to be the primary receivers of acid-gas injectate.

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 for the Dark Horse AGI system (20 MMSCFD), an equal distribution of the entire injection volume between both wells, and an unequal distribution to each well for pressure maintenance. All scenarios were run with and without continuous and coincident operation of the nearby West Jal B Deep #1 saltwater disposal well (SWD), not only to estimate the resultant plume size, but also to estimate bottom-hole and surface pressure trends of the AGI system. Model sensitivity testing identified the West Jal B Deep #1 as the only nearby injection source with the potential to influence the dispersion pattern of the Dark Horse AGI system injection plume. Subsurface faults in the area of review were assumed to be non-transmissive of fluids (sealed) as 3D seismic survey impedance data suggest very low to no porosity near these features.

Figures 8 and 9 illustrate the results of Eclipse injection modeling for the proposed Dark Horse AGI system. After 30 years of injection at the maximum anticipated rate of 20 MMSCF per day, the resultant acid gas plume would occupy an area of approximately 8.3 square miles and reach a maximum of 2.4 miles from the AGI #1 wellbore and 3.0 miles from the Independence AGI #2 BHL if the West Jal B Deep #1 well is not in operation. When operating, the plume footprint is predicted to cover an area of approximately 8.2 square miles and extend a maximum of 2.5 miles from the AGI #1 wellbore and 3.1 miles from the Independence #2 BHL when non-zero saturation levels are considered. Table 5 below summarizes the fraction of acid gas being received by each identified zone within the injection reservoir and shows that the primary fluid receivers correspond to upper Devonian, Wristen/Fusselman, and lower Fusselman strata. Saturation levels within the resultant plume reach a maximum of 65% in the immediate area of the AGI wellbore and are observed to be substantially lower in the outer portions of the plume.

Table 5. Summary of injectate fractions predicted to be received by each identified zone within reservoir upon completion of 30-year injection simulation

West Jal B Deep #1 Not Injecting			**West Jal B Deep #1 Injecting 30,000 bpd**		
Zone #	Total Vol. (MMSCF)	Total Injectate Fraction	Zone #	Total Vol. (MMSCF)	Total Injectate Fraction
1	95,115	44.5	1	97,125	45.5
2	820	0.4	2	977	0.5
3	453	0.2	3	589	0.3
4	8,275	3.9	4	10,832	5.1
5	39,840	18.6	5	45,664	21.4
6	12,152	5.7	6	13,377	6.3
7	9,354	4.4	7	8,305	3.9
8	47,671	22.3	8	36,810	17.2

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

Results of Dark Horse injection system simulations predict that some fraction of acid gas injectate will exhibit a dispersion pattern such that gas reaches the intersection point of local fault features in the area. These features may be interpreted to 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 incorporated reservoir data from the completion of Independence AGI #1 and reviewed available drilling fluid records in the area of the proposed AGI System. Additionally, published literature evaluating regional reservoir pressure conditions in the Delaware Basin were utilized

Illustrated in Figure 10 are wells and associated drilling fluid densities utilized while drilling through overlying producing zones in the area of the Dark Horse AGI system. 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. Such interpretations were confirmed during drilling operations of AGI #1 as, even at 11.9 ppg, formation gas from above the injection interval was routed to the flare suggesting the mud column was slightly underbalanced. Additionally, in preparation for drilling the proposed Independence AGI #2, based on AGI #1 procedures and operations, a preliminary Drilling Fluid Program was designed for the well by Valence Drilling Fluids, LLC (Appendix C). Valance recommends utilizing OBM drilling fluids between 11.00 to 13.00 ppg immediately overlying the injection zone (13,044 to 16,477 feet) and 8.4 to 8.6 ppg from 16,080 to 17,683 feet TVD using fresh water.

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) and were observed while drilling Independence AGI #1. 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 11, 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 observations during drilling operations in AGI #1 and 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 SURFACE GEOLOGY

The proposed Independence AGI #2 site is located in Section 20, T25S, R36E in Lea County, New Mexico, approximately six miles west of Jal (Figure 1). The well location lies on the eastern flank of the Pecos River Basin within the Javelina Basin. Referred to as the South Plain by Nicholson & Clepsch (1961), the region exhibits irregular topography without integrated drainage. Surficial sediments commonly consist of unconsolidated alluvium and eolian sands in areas. There are no observed surface bodies of water, or groundwater discharge sites within one mile of the proposed location. The proposed site overlies 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 Dark Horse gas-treatment facility and AGI wells are/will be located along the eastern margin of the Delaware Basin, a sub-basin of the larger, encompassing Permian Basin (Figure 12), 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 by basin subsidence.

Figure 13 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.

In this area of the Permian Basin, major tectonic activity was primarily confined to the lower Paleozoic section, where seismic data show major faulting and ancillary fracturing affecting generally only as high as the lower Woodford Shale. As the proposed Independence AGI #2 lies relatively close to the Central Basin Platform margins, faulting related to the Hercynian orogeny may be present higher in the stratigraphic section.

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 is up to several hundred feet in thickness. It is overlain by approximately 880 feet of Ordovician Simpson Formation sandstones and tight limestones, as well as approximately 200 feet of basal Montoya cherty carbonates.

The Silurian Fusselman and Wristen 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 Chester 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, currently all are plugged. The proposed Silurian-Devonian injection zone does not produce economic hydrocarbons in the area of the proposed Independence AGI #2, as demonstrated through the collection of mudlogs, rotary sidewall cores, and reservoir fluid samples taken from AGI #1.

4.3 LITHOLOGIC AND RESERVOIR CHARACTERISTICS OF THE SILURO-DEVONIAN FORMATIONS

The proposed injection interval includes the Devonian Thirty-one and Silurian Wristen and Fusselman formations, collectively referred to as the Siluro-Devonian. These strata commonly include numerous intervals of dolomites and dolomitic limestones with moderate to high primary porosity. Additionally, the proposed injection interval includes significant regions of secondary, solution-enlarged porosity produced during periods where strata were subaerially exposed and significant karst features developed. These karst features most frequently developed in the Fusselman Formation and include solution cavities and enlarged fracture and fracture networks through the Siluro-Devonian section, which can be substantial enough to provide additional permeability that is not readily apparent on geophysical well logs. The porous zones of the Siluro-Devonian are separated by tight limestones and dolomites.

In evaluating the proposed Independence AGI #2 location, Geolex completed an in-depth review of licensed seismic survey data (WesternGeco – South Lea Survey) to support the evaluation that the proposed Siluro-Devonian reservoir exhibited sufficient porosity potential to accommodate the needs of the Independence AGI #2 well. Seismic inversion data, specifically impedance attributes, were evaluated to identify reservoir targets with significant porosity potential in the Siluro-Devonian reservoir. As a result of this review, the proposed section 20 location was selected as it was observed to overly an expansive region of porosity in the upper Devonian, Wristen, and Fusselman formation strata.

Based on the geologic evaluation of the subsurface, acid gas injection is recommended between depths of approximately 16,080 to 17,683 feet TVD (16,477 to 18,080 feet MD). Figure 14 includes a type log of the proposed injection zone that includes the formation tops identified at that location and illustrates the sufficient low-porosity intervals overlying the target injection reservoir. Anticipated formation tops underlying the proposed Independence AGI #2 location are included in the following Table 6. In the area of the proposed well, depth to Devonian strata increases to the southwest and the proposed AGI location lies downdip of a structural high to the east (Figure 15).

Units overlying the proposed injection interval provide excellent caprock to prevent the upward migration of injectate out of the target reservoir. This caprock includes 335 feet of dense Woodford Shale overlain by at least 796 feet of tight Mississippian limestone (Figures 14 and 16). These units will provide an excellent geologic seal above the porous carbonates of the injection zone providing protection to shallow groundwater resources and overlying pay intervals.

Figure 16 includes structural cross section A-A' covering the area of the proposed Independence AGI #2 and highlights the lateral extent of available upper Devonian porosity and the regional coverage of overlying caprock in the area. As shown in Figure 15, there are two faults located approximately one mile east and one mile north from the proposed AGI SHL. These structures were identified through review of licensed 3D seismic survey data and are discussed further in Section 4.6.

Table 6. Anticipated formation tops at proposed Independence AGI # 2 location

FORMATION	DEPTH (TVD)	DEPTH (MD)	FORMATION	DEPTH (TVD)	DEPTH (MD)
Dockum	485	485	Bone Springs	8,467	8,632
Ochoa-Dewey	747	747	Wolfcamp	11,131	11,387
Rustler	1,130	1,130	Strawn	12,004	12,289
Salado	1,720	1,720	Atoka	12,733	13,044
Tansill	3,401	3,401	Morrow	13,541	13,880
Yates	3,461	3,461	Barnett	14,949	15,336
7 Rivers	3,542	3,542	Osage	15,380	15,703
Queen	3,663	3,663	Woodford	15,745	16,142
Capitan Reef	3,935	3,943	Devonian	16,080	16,477
Bell Canyon	5,425	5,484	Wristen	16,467	16,864
Cherry Canyon	6,277	6,364	Fusselman	17,201	17,598
Brushy Canyon	7,058	7,174	Montoya	17,684	18,081

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 identified 21 wells with analyses of fluid samples collected from the Siluro-Devonian interval. These samples were collected from wells within approximately 15 miles of the proposed Independence AGI #2 and have been supplemented with samples collection from AGI #1 (Section 20, T25S, R36E). Results of laboratory analysis to determine their composition are summarized in Table 7.

Table 7. Summary of Siluro-Devonian produced water analyses from nearby wells (U.S. Geological Survey National Produced Water Geochemical Database v. 2.3)

API	WELL NAME	CONCENTRATION (parts per million)							
		TDS	HCO3	Ca	Cl	K + Na	Mg	Na	SO4
3002548081	Ind. AGI 1	110000	342	5600	68000	32559	759	31800	664
3002510945	Hill-federal D 1	112959	288	6264	67390	34340	1912	-	2765
3002510947	EC Hill-federal 1	35639	-	1369	22070		592	11608	-
3002511126	JR Holt A3	116415	154	7501	71110	34680	1767	-	1203
3002511196	S. Mattix Unit 3	68431	990	3180	40960	21690	974	-	637
3002511202	S. Mattix Unit 11	67130	853	5075	40430	16950	2348	-	1474
3002511383	Hodges B 3	81712	722	4320	47500	25400	1030	-	2740
3002511556	Blocker-federal 4	57675	595	2850	34030	18370	619	-	1211
3002511747	Ab Coates FED D2	82794	977	2408	47200	28190	851	-	3168
3002511760	Ida Wimberley 5	63817	360	2774	35870	20750	621	-	3442
3002811763	Ida Wimberley 9	61040	900	2680	35600	19560	800	-	1500
3002511765	Carlson-federal A3	66418	690	3002	37650	20390	1339	-	3347
3002511812	Clyde Lanehart 1	99879	687	4753	60410	32610	828	-	591
3002511818	Copper 1	27506	1089	1384	15270	8144	540	-	1079
3002511863	Arnott Ramsay B3	158761	476	17240	100300	35400	5345	-	-
3002511886	Dabbs 1	101036	540	5393	61630	30380	2183	-	910
3002511890	Sam Dabbs 1	85150	675	5368	50260	25130	1395	-	2322
3002511907	Arnott Ramsay F9	58220	367	1546	32790	-	278	20430	2816
3002511950	Farnsworth FED 6	31931	302	7196	20450	1151	2241	-	591
3002512272	LE Elliott FED H1	58687	761	3004	35460	18980	482	-	-
3002512286	JB McGhee 1	62392	552	2696	34380	20060	702	-	4002
3002521601	North Custer Mt 1	>64,000	1610	2136	36230	21830	403	-	1950

These analyses report Total Dissolved Solids (TDS) in the area of the proposed AGI well ranging from 27,506 to 158,761 parts per million (ppm) with an average of 75,981 ppm. The primary constituent in sampled formation waters is the chloride ion, with an average concentration of 45,227 ppm. The closest well, AGI #1, at approximately 3,000 feet away (from BHL), has reservoir fluids with a TDS value of 110,000 ppm, and chloride ions in concentrations of 68,000 ppm.

Based on these data, the Siluro-Devonian reservoir fluids are anticipated to be completely compatible with the acid gas injectate as has been displayed by the continuing operation of AGI #1.

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 15 water wells and points-of-diversion located within a two-mile radius of the proposed Independence AGI #2 well, and only two water wells within a one-mile radius. Of these wells, the closest is located approximately 0.34 miles away and has a total depth of 505 feet (Figure 17; Table 8). The remaining wells within the two-mile radius are shallow, collecting water from approximately 240 to 600 feet deep in Alluvium and the Triassic red beds. The shallow freshwater aquifer will be protected as the proposed well design isolates shallow zones via a five-string casing design including a surface casing interval that extends to 1,230 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 8. Water wells within one mile of the proposed Independence AGI #2 (Retrieved from the New Mexico Office of the State Engineer's Files on October 10, 2020)

POD #	Source	Use	Owner	LAT (NAD83)	LONG (NAD83)	Distance (miles)	Depth (feet)	Date Completed
CP 1170 POD 5	Shallow	Commercial	NGL South Ranch	32.121417	-103.296667	0.34	505	11/2014
CP 465 POD 1	Shallow	Commercial	NGL South Ranch	32.119465	-103.299882	0.53	560	08/1963

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 of the proposed Independence AGI #2. Table 9 summarizes the wells identified in this review and the results of those analyses.

Table 9. Chemical analysis results of samples collected from water wells in the area of the proposed Independence AGI #2 (Nicholson and Clebsch, 1961 – *Geology and Groundwater Conditions in Southern Lea County, New Mexico*)

Historical Owner	Location (T-R-S)	Location (Qtr-Qtr)	Depth (ft)	Ca (ppm)	Mg (ppm)	Na+K (ppm)	HCO_3 (ppm)	SO_4 (ppm)	Cl (ppm)	NO_3 (ppm)
Sun Oil Co.	25-37-15	NE/4 NE/4	-	307	98	271	145	737	610	9
City of Jal	25-37-19	NE/4 NE/4	500	55	49	170	376	280	71	0.4
City of Jal	25-37-19	SE/4 NE/4	450	34	43	175	264	286	54	0.5
City of Jal	25-37-20	NW/4 SW/4	70	-	-	-	150	145	168	7.6

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 freshwater-bearing strata.

4.6 POTENTIAL FOR INDUCED SEISMICITY IN THE AREA OF THE DARK HORSE INJECTION SYSTEM

To evaluate the potential for seismic events in response to injected fluids, Geolex conducted an induced-seismicity risk assessment in the area of the Dark Horse Injection System, which includes Independence AGI #1 and #2. This estimate 1) models the impact of seven injection wells over a 30-year injection period, and 2) estimates the fault-slip probability associated with the simulated injection scenario. This analysis was completed utilizing the Stanford Center for Induced and Triggered Seismicity's (SCITS) Fault Slip Potential (FSP) model developed by Walsh and Zoback, 2016.

To identify subsurface structures in the area of the proposed AGI well, Geolex evaluated and interpreted licensed seismic survey data (WesternGeco South Lea Survey) covering the Lea County area of interest. Based on this review, Geolex identified eight subsurface faults in the area of the Dark Horse Injection System (Figure 18). The closest fault is observed to be located approximately 0.98 miles east of the proposed well/injection system. Major faults in the area (those exhibiting significant lateral extent) generally strike NNW-SSE with minor faults striking NE-SW and NW to SE.

Due to the location of faults relative to active and proposed injection wells and the general low density of injection wells in the immediate area of the proposed AGI well, it is anticipated that the disposal scenario will not pose any elevated risk of injection-induced fault slip. To support the interpretation that these structures would not be affected by operation of the injection system as proposed, a fault-slip probability analysis was completed to quantify the risk associated with injection operations in the area of AGI #2, and although the risk of induced seismicity is low, a seismic monitoring station was installed at the facility prior to the commencement of injection into AGI #1. The station transmits data to the New Mexico Tech Seismic Network and will aid the state in seismicity interpretations.

To calculate the fault-slip probability for this injection scenario, input parameters characterizing the local stress field, reservoir characteristics, subsurface features, and injected fluids are required. Parameters utilized and their sources for this study area are included in Table 10. Additionally, Table 11 details the injection volume characteristics and locations of the disposal wells modeled in this scenario. To ensure the model simulations provide a conservative estimation of induced-seismicity risk, injection wells included in the simulations were modeled utilizing their maximum anticipated daily injection volumes as recorded by NMOCD records. Due to the minimal reported injection volume of the Jal North Ranch SWD #1, a potential of 10,000 bpd was assumed in the event that injection rates increase as a result of increased need or any future workover that may improve the injectivity of this well.

Table 10. Input parameters and source material for FSP model simulations

Modeled Parameter	Input Value	Variability (+/-)	UOM	Source
Stress				
Vertical Stress Gradient	1.05	0.105	psig/ft	Nearby well estimate
Max Horizontal Stress Direction	N75E	5	Deg	Lund Snee & Zoback, 2018
Reference Depth	17000		ft	Nearby well evaluation
Initial Res. Pressure Gradient	0.43	0.043	psig/ft	Lund Snee & Zoback, 2018 Nearby well evaluation
A_ϕ Parameter	0.6	0.06	-	Lund Snee & Zoback, 2018
Reference Friction Coefficient (μ)	0.6	0.06	-	Standard value
Hydrologic				
Aquifer Thickness	1500	0	ft	Nearby well evaluation
Porosity	3.5	0.35	%	Nearby well evaluation
Permeability	20	2	mD	Nearby well evaluation
Material Properties				
Density (Water)	1040	40	Kg/m^3	Standard value
Dynamic Viscosity (Water	0.0008	0.0001	Pa.s	Standard value
Fluid Compressibility (Water)	3.6×10^{-10}	0	Pa^{-1}	Standard value
Rock Compressibility	1.08×10^{-9}	0	Pa^{-1}	Standard value
Acid Gas Properties @ 7,370 psig & 228 ºF				
Density	821.80	-	kg/m^3	AQUAlibrium™
Dynamic Viscosity	8.067×10^{-5}	-	Pa.s	AQUAlibrium™

Table 11. Location and characteristics of injection wells modeled in the FSP assessment

#	API	Well Name	LAT	LONG	Volume (bbls/day)	Start (year)	End (year)
1	3002548081	Independence AGI #1	32.120855	-103.291021	4265	2020	2052
2	-	Independence AGI #2	32.111454	-103.288812	4265	2022	2052
3	3002524287	Crosby Deep #2	32.089508	-103.166733	6800	2010	2052
4	3002545795	Sholes Deep SWD #1	32.110998	-103.201266	30000	2020	2052
5	3002527085	Jal N. Ranch SWD #1	32.139347	-103.203911	10000*	2017	2052
6	3002525046	West Jal B Deep #1	32.132091	-103.280708	30000	2015	2052
7	3002543360	Kimberly SWD #1	32.083537	-103.194274	20000	2019	2052

*NMOCD records include no information regarding the maximum anticipated injection volume

Daily maximum injection volumes utilized in the fault-slip probability model range from 4,265 to 30,000 bpd (Table 11). In submission of this application, Piñon is requesting approval to operate the proposed Independence AGI #2 for a period of at least 30 years, however, the duration of the FSP model simulation was increased to 40 years in order to characterize the reservoir effects of disposal wells that are currently operating and have been in operation since 2010. Figure 19 shows the resultant pressure front and single-well radial pressure solutions, as predicted by the FSP model, after 30 years of injection at the maximum injection rates.

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 (AGI) systems. To ensure a conservative fault-slip probability estimate, the proposed AGI well was simulated utilizing the characteristics of a SWD

injectate. This approach yields a more conservative model prediction as water displays greater density, dynamic viscosity, and is significantly less compressible than acid gas. For comparison, characteristics of acid gas at the anticipated reservoir conditions, as modeled by AQUAlibrium™, are shown in Table 10.

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 AGI system is not predicted by the model to contribute significantly to the estimate of risk (Table 12, Figure 20). Table 12 summarizes the predicted pressure change along each fault segment and includes the model-derived pressure change necessary to induce slip for each feature. Fault-slip probability values range from 0.00 to 0.05 with the majority of fault segments predicted to have zero probability of slip (Table 12). Major faults (faults 4, 7, and 8) in the area, which would have the greatest energy release potential upon slip, are predicted to have zero probability for slip in response to the modeled injection scenario. As shown in Table 12, when the contribution of the proposed AGI well is excluded, no significant changes in slip probability are predicted.

Table 12. Summary of model-simulation results showing the required pressure change to induce fault slip, actual change in pressure as predicted by the FSP model, probability of fault slip at the end of the 30-year injection scenario, and fault-slip probability when the proposed AGI is excluded from simulation

Fault #	Segment #	ΔPressure necessary to induce fault slip	Actual ΔPressure at 2052	Fault Slip Potential at 2052	FSP (excluding AGI)
1	1	3137	109	0.00	0.00
	2	4357	103	0.00	0.00
	3	1786	93	0.00	0.00
	4	1201	83	0.01	0.01
2	5	1197	253	0.05	0.05
3	6	6869	186	0.00	0.00
	7	6298	168	0.00	0.00
4	8	5645	277	0.00	0.00
	9	4610	194	0.00	0.00
	10	5005	117	0.00	0.00
	11	2709	70	0.00	0.00
	12	5302	63	0.00	0.00
	13	6339	57	0.00	0.00
	14	6899	51	0.00	0.00
	15	4197	46	0.00	0.00
5	16	1101	192	0.03	0.03
	17	1085	199	0.02	0.02
6	18	1554	234	0.04	0.04
7	19	6012	290	0.00	0.00
	20	6680	241	0.00	0.00
	21	6914	133	0.00	0.00
	22	6758	61	0.00	0.00
	23	6931	33	0.00	0.00
	24	6590	25	0.00	0.00
8	25	6508	250	0.00	0.00
	26	6327	334	0.00	0.00
	27	5455	228	0.00	0.00
	28	6305	174	0.00	0.00
	29	6684	89	0.00	0.00

In summary, no structures included in the modeled simulations are predicted to be at increased risk for injection-induced slip in response to the injection scenario presented. Features estimated to have a non-

zero slip potential are generally smaller-scale features and predicted probabilities are very low (≤ 0.05). Furthermore, subsequent model simulations in which contribution from the proposed AGI is excluded illustrate that operation of the AGI well will have little impact on conditions near the identified faults in the area due to significantly lower proposed injection volumes in comparison to nearby SWD wells, however, any occurrence of seismicity in the area will be detected with the aid of the active seismic monitoring station installed on the facility grounds.

5.0 OIL AND GAS WELLS IN THE INDEPENDENCE AGI #2 AREA OF REVIEW AND VICINITY

Appendix A summarizes in detail all NMOCD recorded wells within a one- and two-mile radius of the proposed Independence AGI #2. These wells are shown in figures A-1 and A-2 and include active, plugged, cancelled, and permitted well locations. Table A-1 details all wells within two miles of the proposed AGI well location and wells located within one mile are summarized in Table 13 below.

In total, there are 51 wells within a two-mile radius of the proposed Independence AGI #2 (Appendix A, Figure A-1, Table A-1). Of these, there are 10 active wells, 31 permitted, and 10 plugged (five wells have been cancelled). Active wells in the area include one SWD well completed across Strawn through Fusselman zones and nine active oil wells completed in various strata.

Within one mile of the proposed AGI, there are 12 wells, of which, eight are active or permitted and four are plugged (Figure A-2, Table 13).

Table 13. Wells located within one mile of the proposed Independence AGI #2 (Additional details are provided in Appendix A Table A-2)

API	Well Name	Pool	Status	LAT (NAD83)	LONG (NAD83)	TVD
3002521172	West Jal Unit #001	Strawn	Plugged	32.1176	-103.28074	17086
3002538059	Dinwiddie St COM #001	Strawn	Plugged	32.12485	-103.27646	12192
3002521039	West Jal 18 #1	Wildcat	Plugged	32.1276	-103.30099	12950
3002509778	Federal #1	Wildcat	Plugged	32.12124	-103.29781	3891
3002520857	West Jal B #1 (SWD)	Delaware	Active	32.12848	-103.28498	12275
3002546393	Nandina 25 36 31 Federal COM #124H	Wolfcamp	New	32.10848	-103.30525	-
3002548081	Independence AGI #1	Devonian-Fus.	Active	32.12084	-103.29103	17750
3002548615	Blue Marlin State #212H	Wolfcamp	New	32.10940	-103.30559	-
3002549118	Blue Marlin Federal COM #202H	Wolfcamp	New	32.10940	-103.30562	-
3002549121	Blue Marlin Federal COM #215H	Wolfcamp	New	32.10940	-103.30570	-
3002549196	Blue Marlin Federal COM #212H	Wolfcamp	New	32.10940	-103.30554	-
3002525046	West Jal B Deep #1 (SWD)	Miss.-Fus.	Active	32.13209	-103.28071	18945

There are three wells within two miles of the proposed AGI location that penetrate the anticipated injection interval (Table 14), one of which is Independence AGI #1. Of the other two wells, one is an active SWD (West Jal B Deep #1) located approximately 1.0 miles from the proposed SHL. This well was drilled to a total depth of 18,945 feet and is permitted to inject through perforated intervals of Strawn through Fusselman strata. Despite being granted approval for injection into the Fusselman (approved June 2014), NMOCD records document no reports of work to drill out plugged intervals at 14,200 feet. One Form C-103 (submitted November 2018) indicates the intent of BC&D operating to drill out these intervals, but no subsequent reports confirming completion of this work have been identified. Additionally, reported injection volumes for this well do not appear to exhibit any significant increase that might indicate this work was completed.

The remaining well penetrating the proposed interval is the plugged West Jal Unit #1, located approximately 0.67 miles from the proposed AGI SHL. Final plugging operations were completed in April 1984 and all relevant plugging reports and documents are included in Appendix A. The well is

properly cemented through the injection zone and it is not anticipated to be negatively affected by the operation of the AGI wells.

Table 14. Wells located within two miles of Independence AGI #2 that penetrate the proposed injection interval

API	Well Name	Pool	Status	LAT (NAD83)	LONG (NAD83)	TVD
3002521172	West Jal Unit #1	Del., Strawn	Plugged	32.117596	-103.280739	17086
3002525046	West Jal B Deep #1	Strawn-Fus.	Active	32.132091	-103.280708	18945
3002548081	Independence AGI #1	Devonian-Fus.	Active	32.12084	-103.29103	17750

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

On behalf of Piñon, Ameredev II, LLC completed a detailed review of Lea County, New Mexico land records 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 review.

Table B-1 summarizes the surface owners, identifies the operators, and lists working interest owners 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 includes information on leaseholders and mineral ownership within one mile of the proposed AGI well location.

Written notification of Piñon's intent to submit the Independence AGI #2 C-108 application were sent to identified interested parties on November 1, 2021, via FEDERAL EXPRESS. As an attachment to these notifications, each party was provided a complete copy of the Independence AGI #2 application and supporting materials. Appendix B includes all notice letters that were sent to interested parties, as well as proof of delivery. Additionally, public notice of Piñon's application was published in the Hobbs News Sun on Tuesday, October 26, 2021. The complete publication and associated Affidavit of Publication is included in Appendix B. To date, no parties identified within the Independence Area of Review, or other members of the public have raised objection or requested additional information regarding the proposed AGI well.

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 Independence AGI #2 well has been performed. The investigation included the analysis of available geologic data and hydrogeologic data from wells and literature identified in sections 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.

Alberto A. Gutiérrez, C.P.G.
President
Geolex, Inc.®

Signature: _____ Date: 11/1/2021

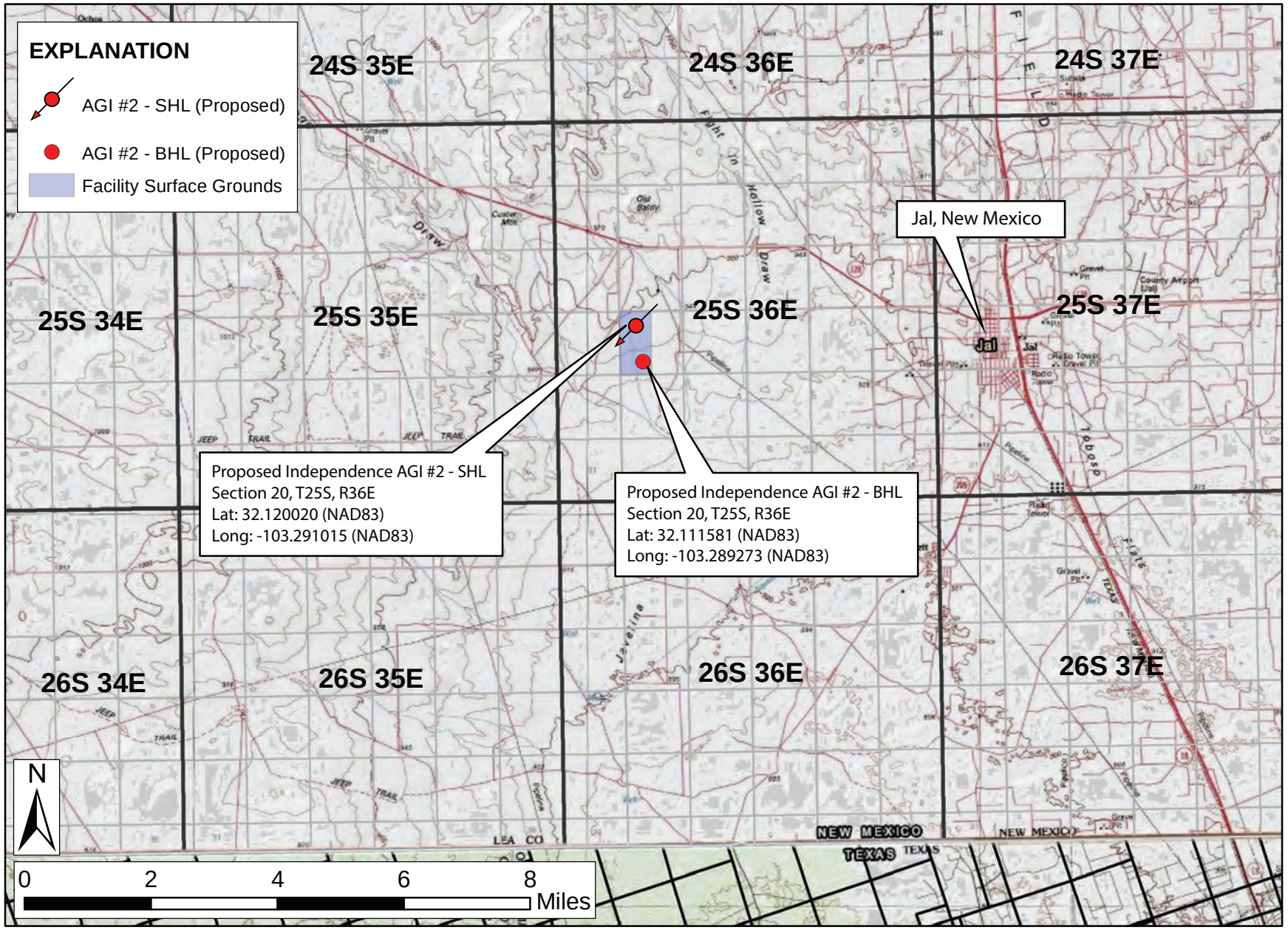


Figure 1. General location map for proposed AGI well in Section 20 (T25S, R36E) approximately six miles west of Jal, New Mexico

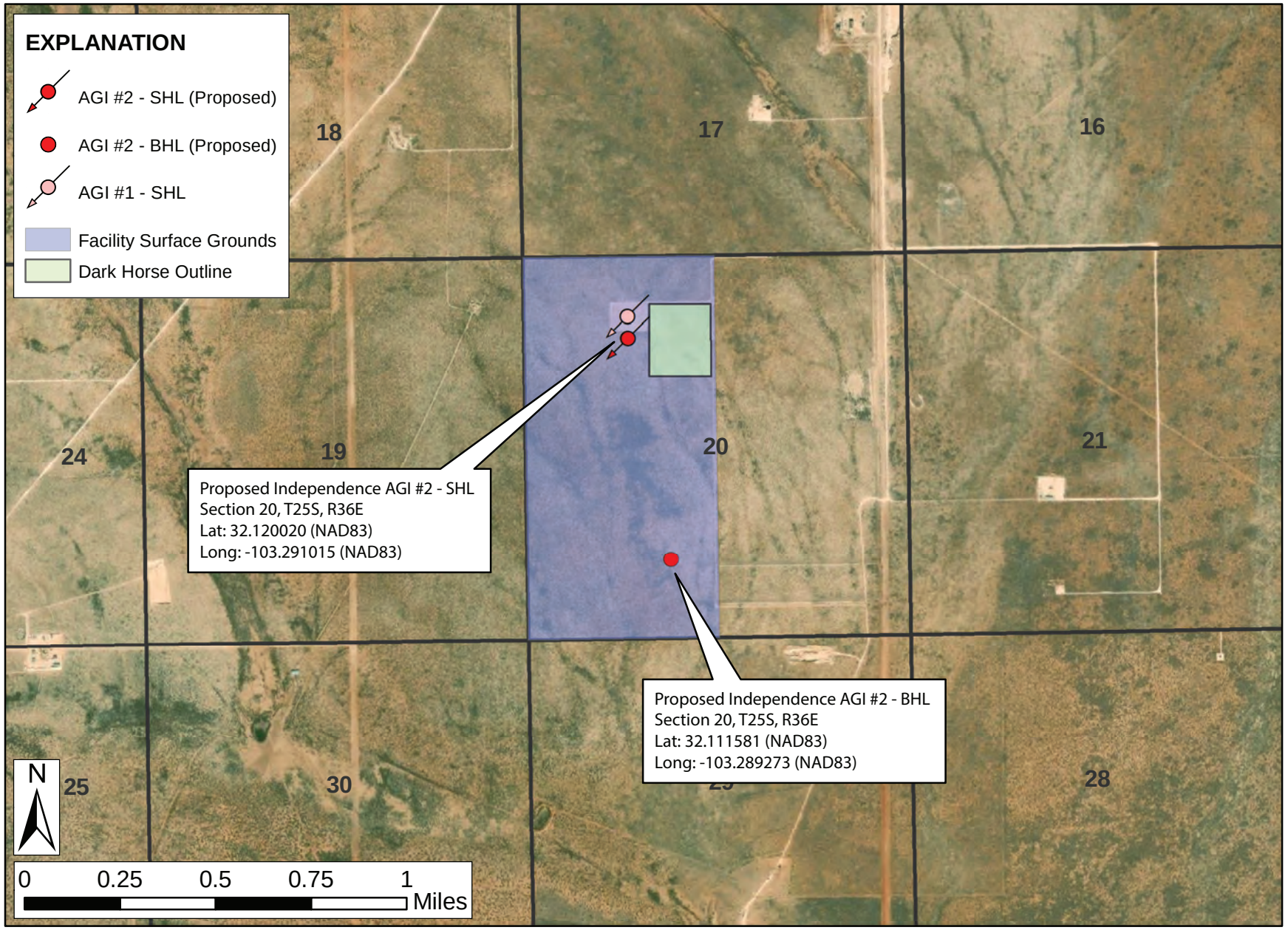


Figure 2. Detailed locaton map showing the proposed Independence AGI #2 and Piñon surface lands where plant facilites have been constructed

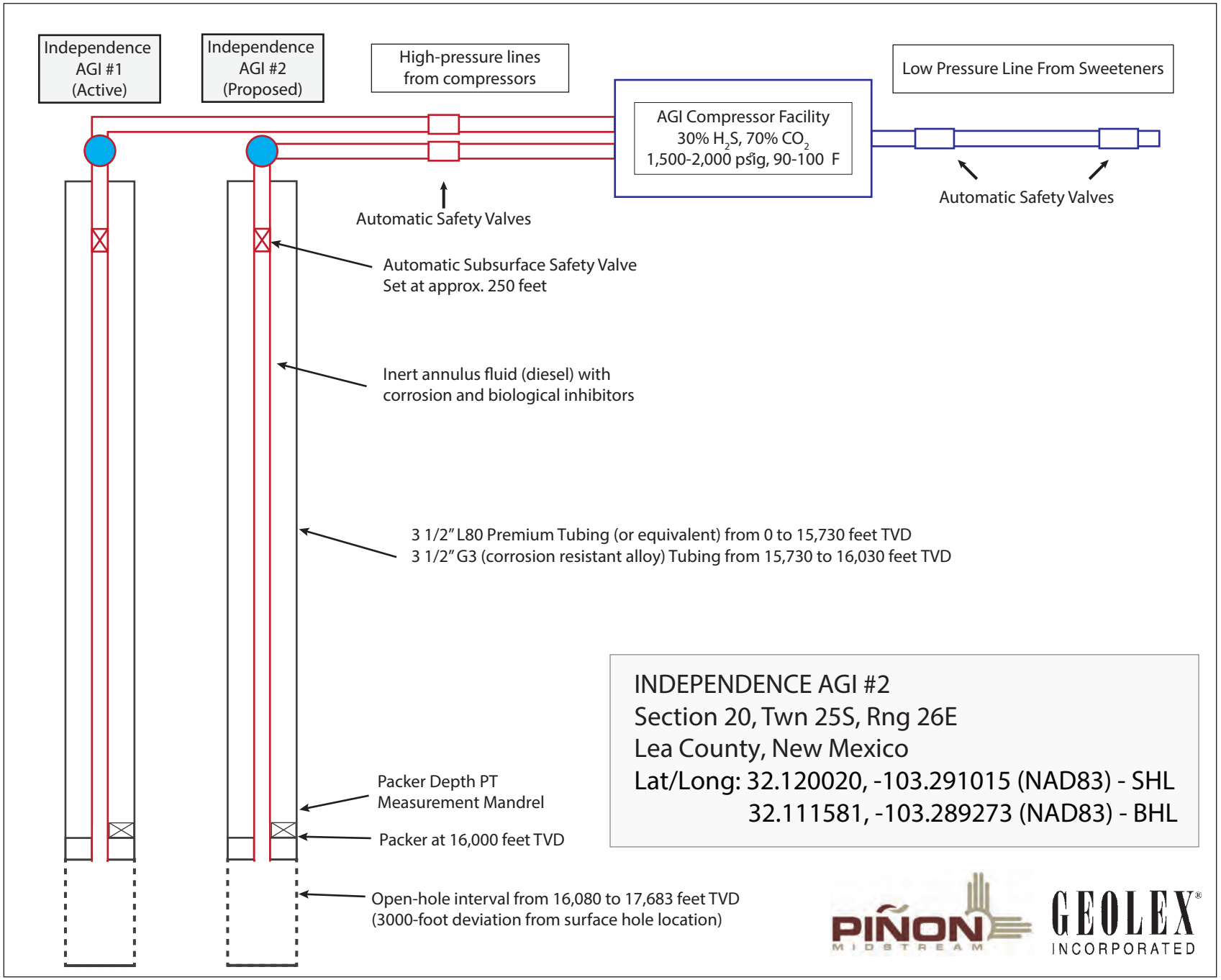


Figure 3. Schematic of surface facilities, proposed Independence AGI #2 and existing Independence AGI # 1

WELL SCHEMATIC
INDEPENDENCE AGI #2
S20 - T25S - R36E

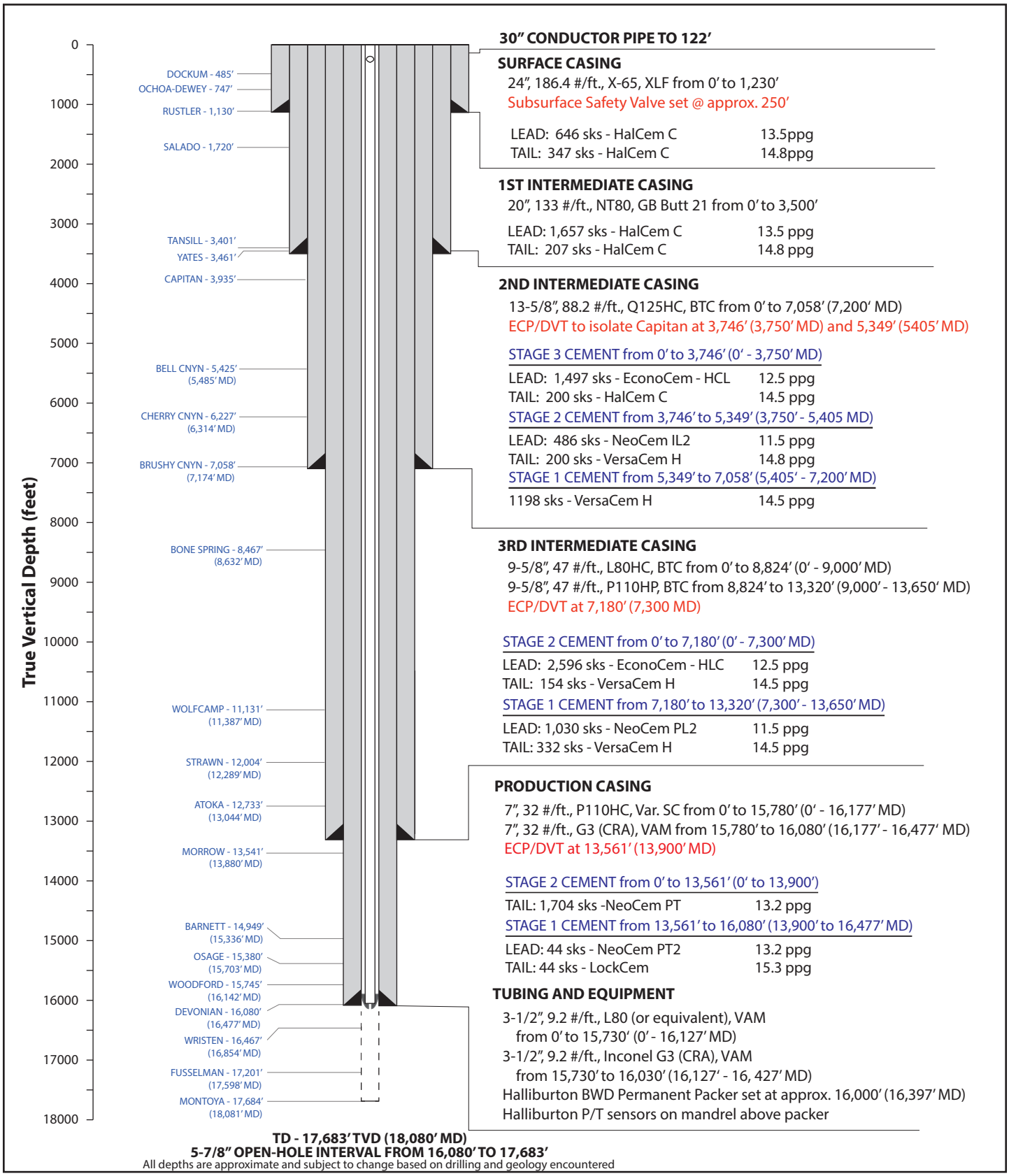


Figure 4. Well design consisting of a surface string of casing, three intermediate strings, and a production string with associating tubing/equipment and cement types

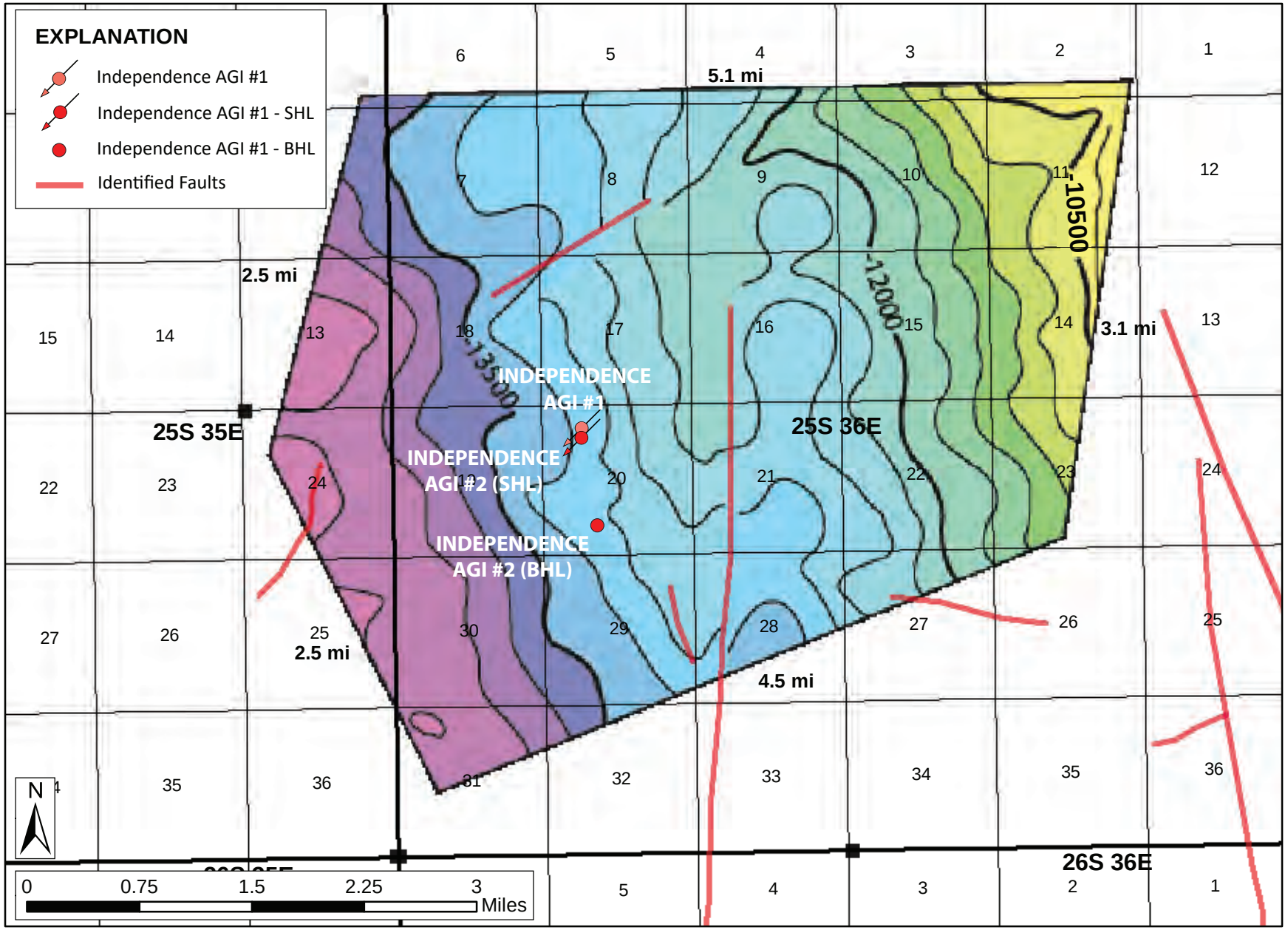
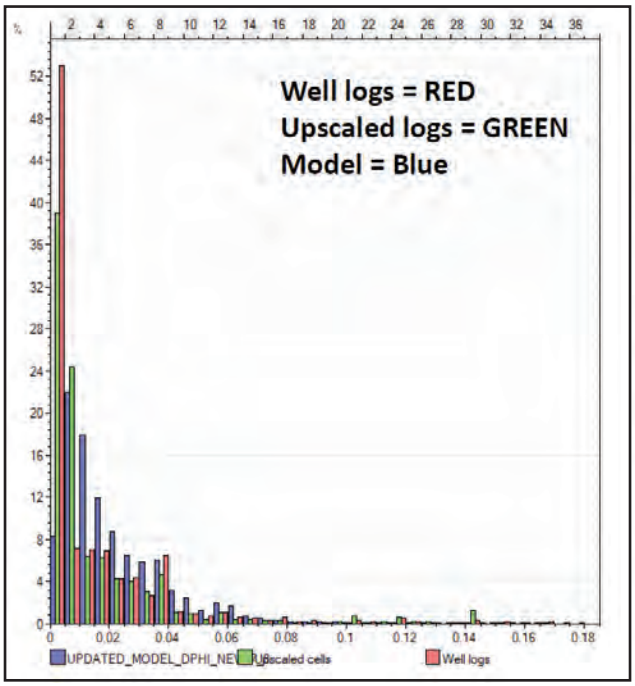
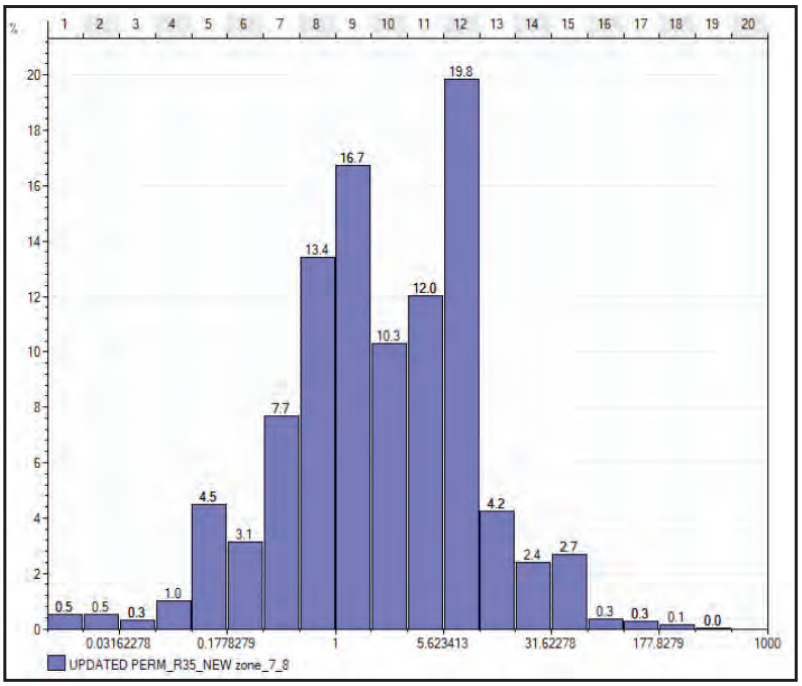


Figure 5. Location map illustrating areal extent of geologic model grid constructed to simulate the proposed Dark Horse Treatment Facility injection scenario. Total coverage area of approximately twenty square miles.

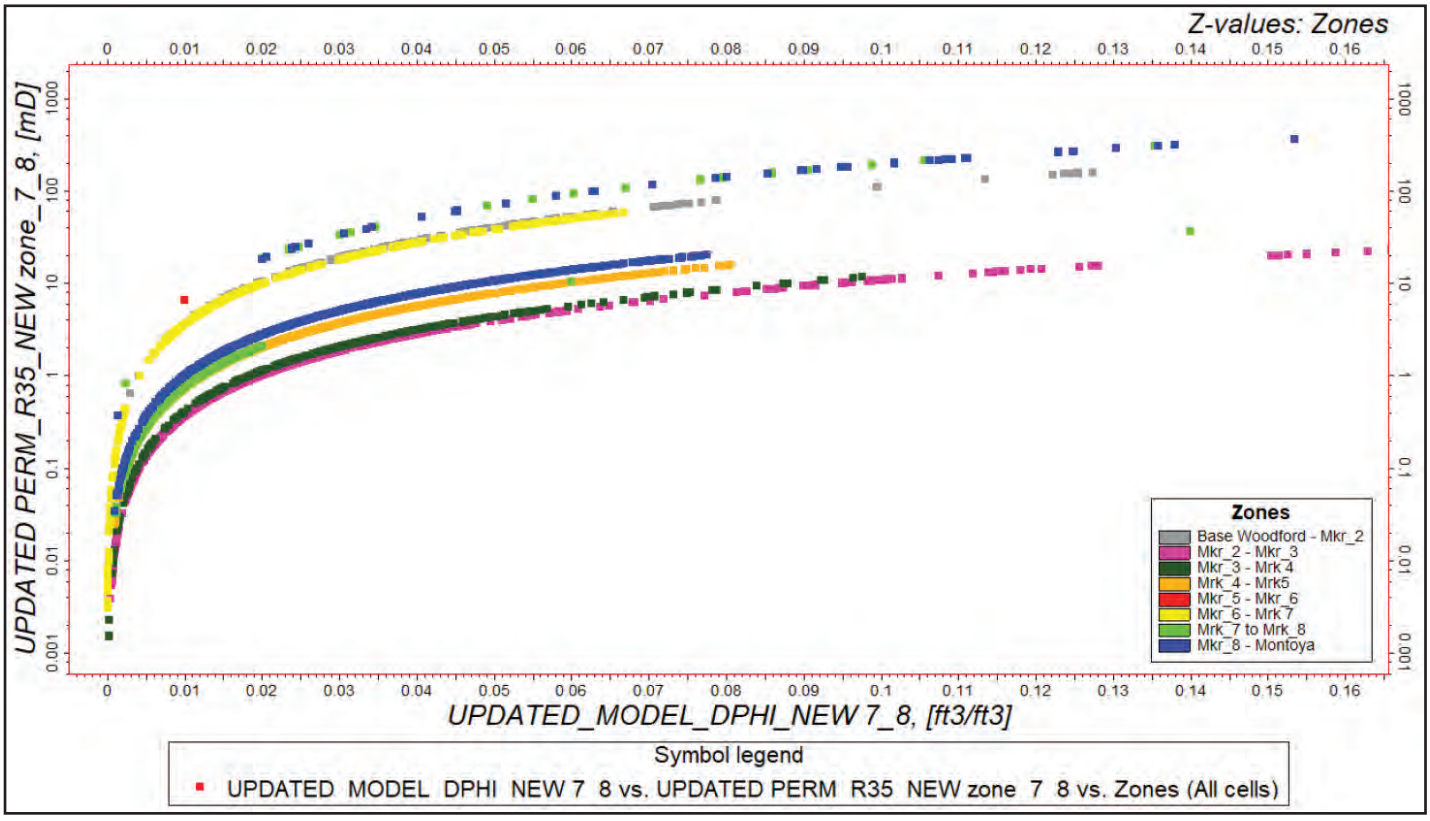
MODEL SIMULATION GRID CHARACTERISTICS



DPHI Distribution
(3 available well logs)



Winland R35 Permeability Distribution



Permeability (Winland R35) vs. Model DPHI

Figure 6. Geologic model porosity and permeability distribution generated from available wells (n=3), and further informed by AGI #1 data, drill-stem and injection test, and 3D seismic survey impedance data

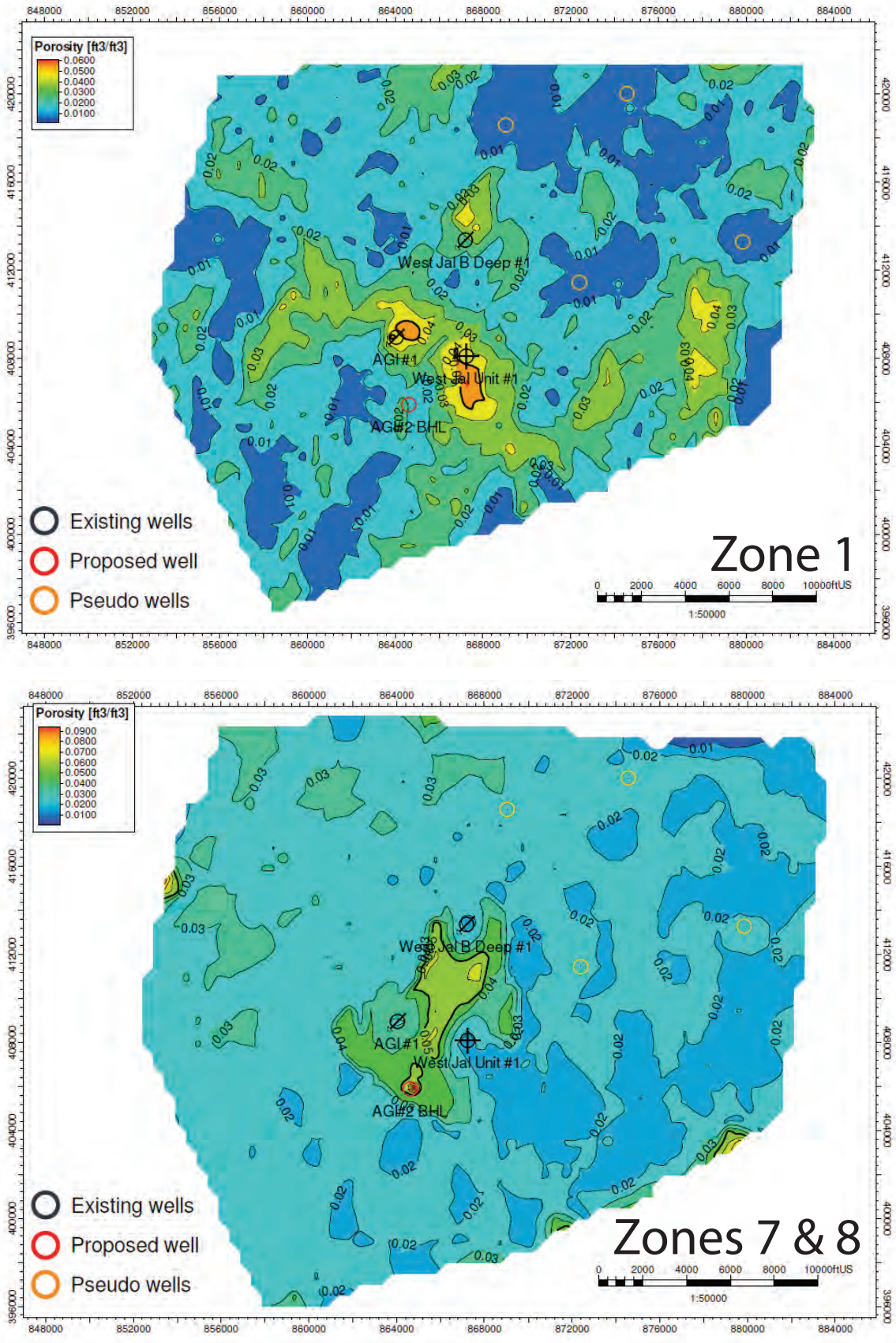


Figure 7. Model porosity distribution maps for two intervals (Zone 1 and Zones 7 & 8) predicted to receive the greatest fraction of acid gas injectate. Pseudo wells implemented to characterize high and low porosity zones identifed via review of seismic impedance data are included.

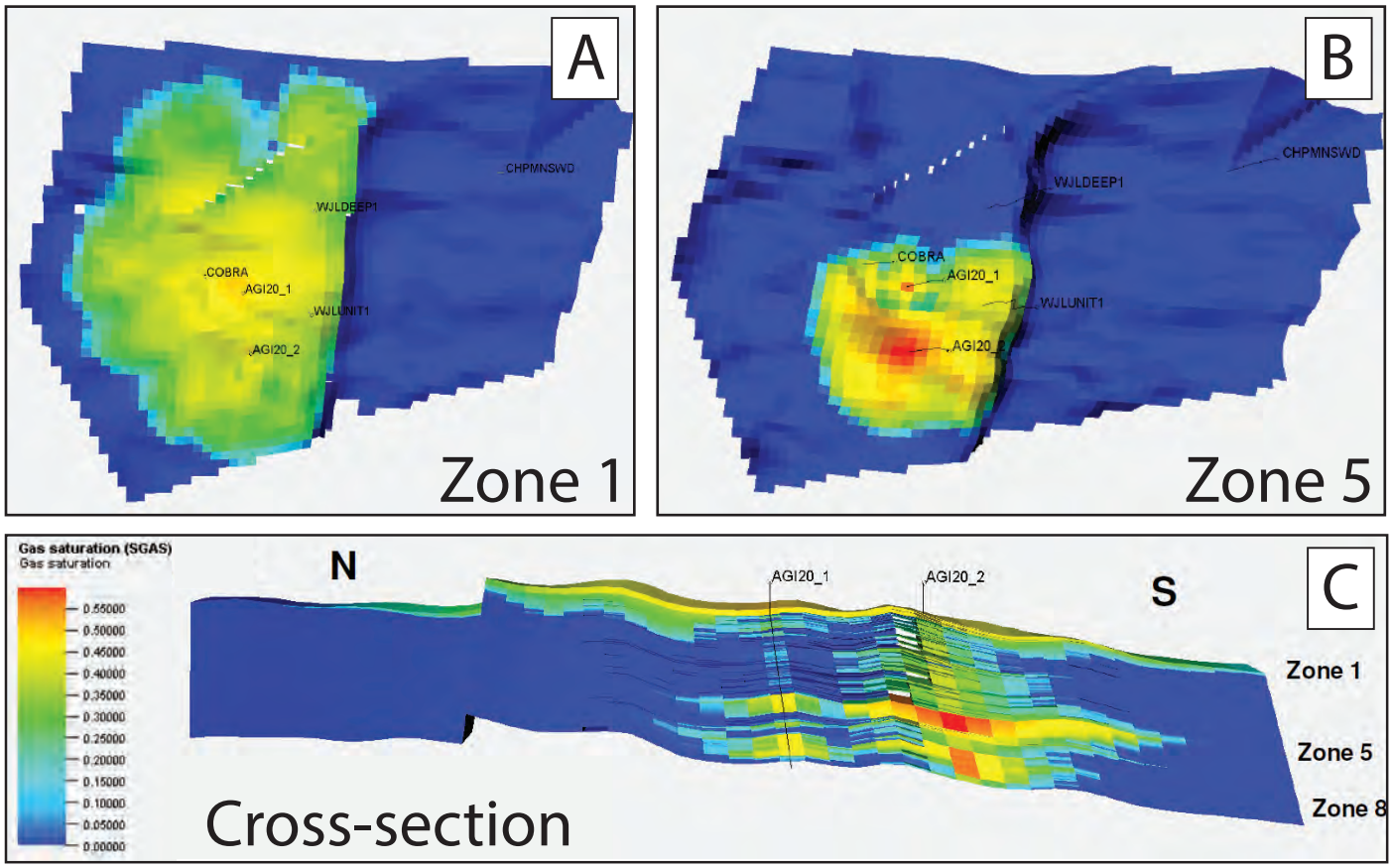


Figure 8. Summary of ECLIPSE injection simulation results when West Jal B Deep #1 is not actively injecting. Panels A and B include gas saturation maps for identified zones 1 and 5; panels C illustrates the cross-sectional view of the resultant injection plume; panel D illustrates combined zone 1 and zone 5 plume footprint

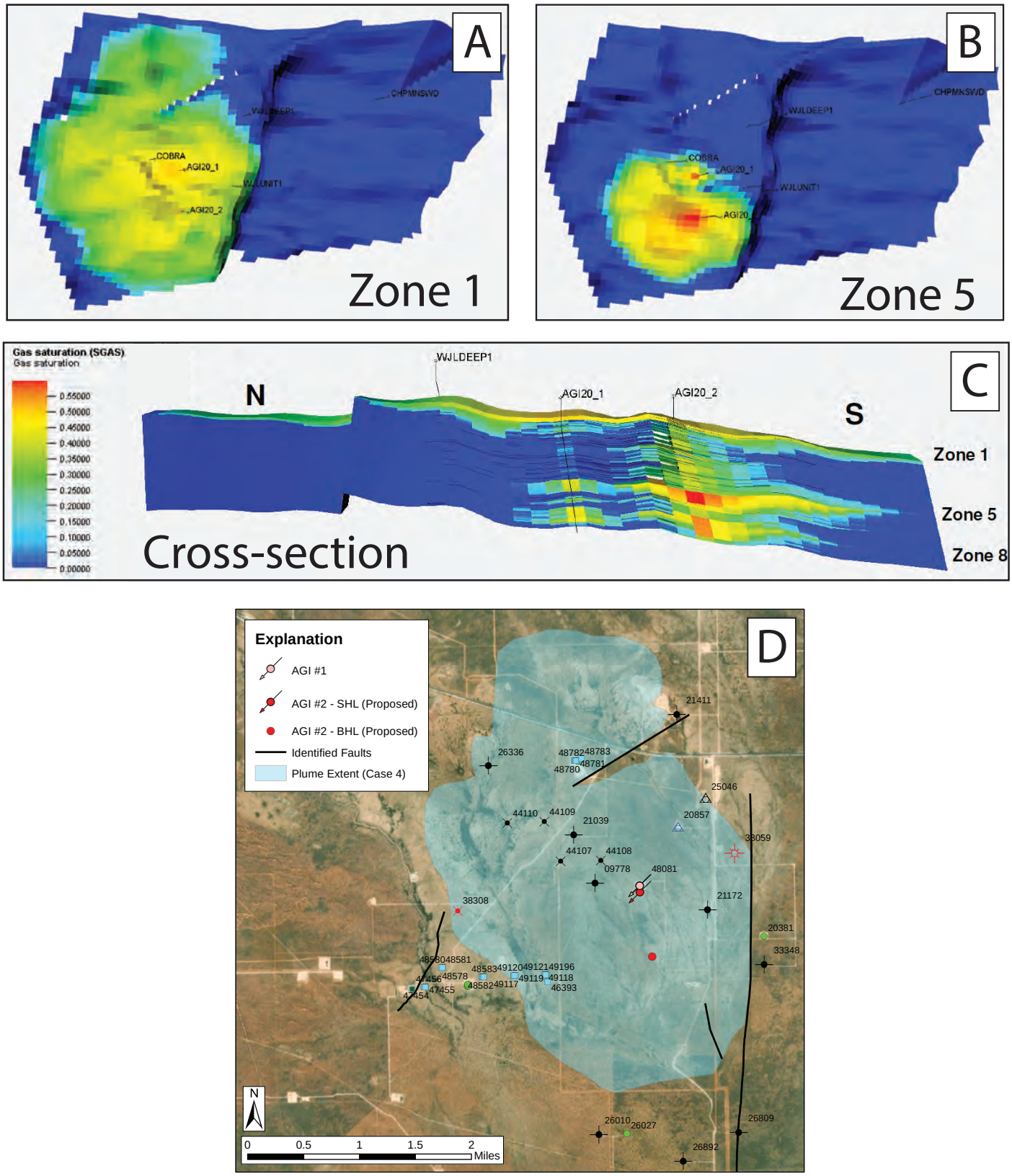


Figure 9. Summary of ECLIPSE injection simulation results when West Jal B Deep #1 is actively injecting. Panels A and B include gas saturation maps for identified zones 1 and 5; panels C illustrates the cross-sectional view of the resultant injection plume; panel D illustrates combined zone 1 and zone 5 plume footprint

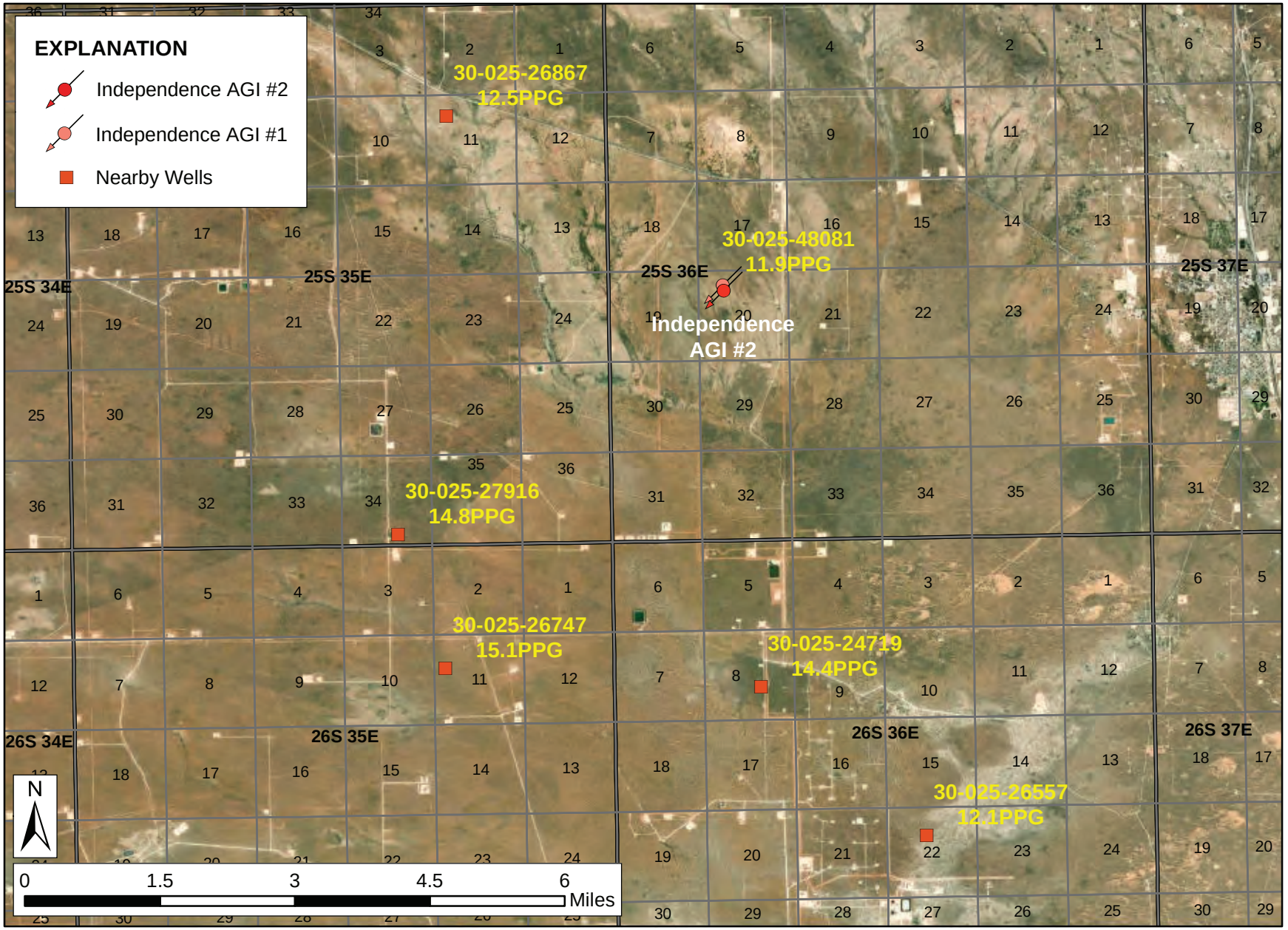


Figure 10. Location map summarizing drilling fluid weights utilized while drilling through overlying productive intervals and strata directly above the proposed injection zone

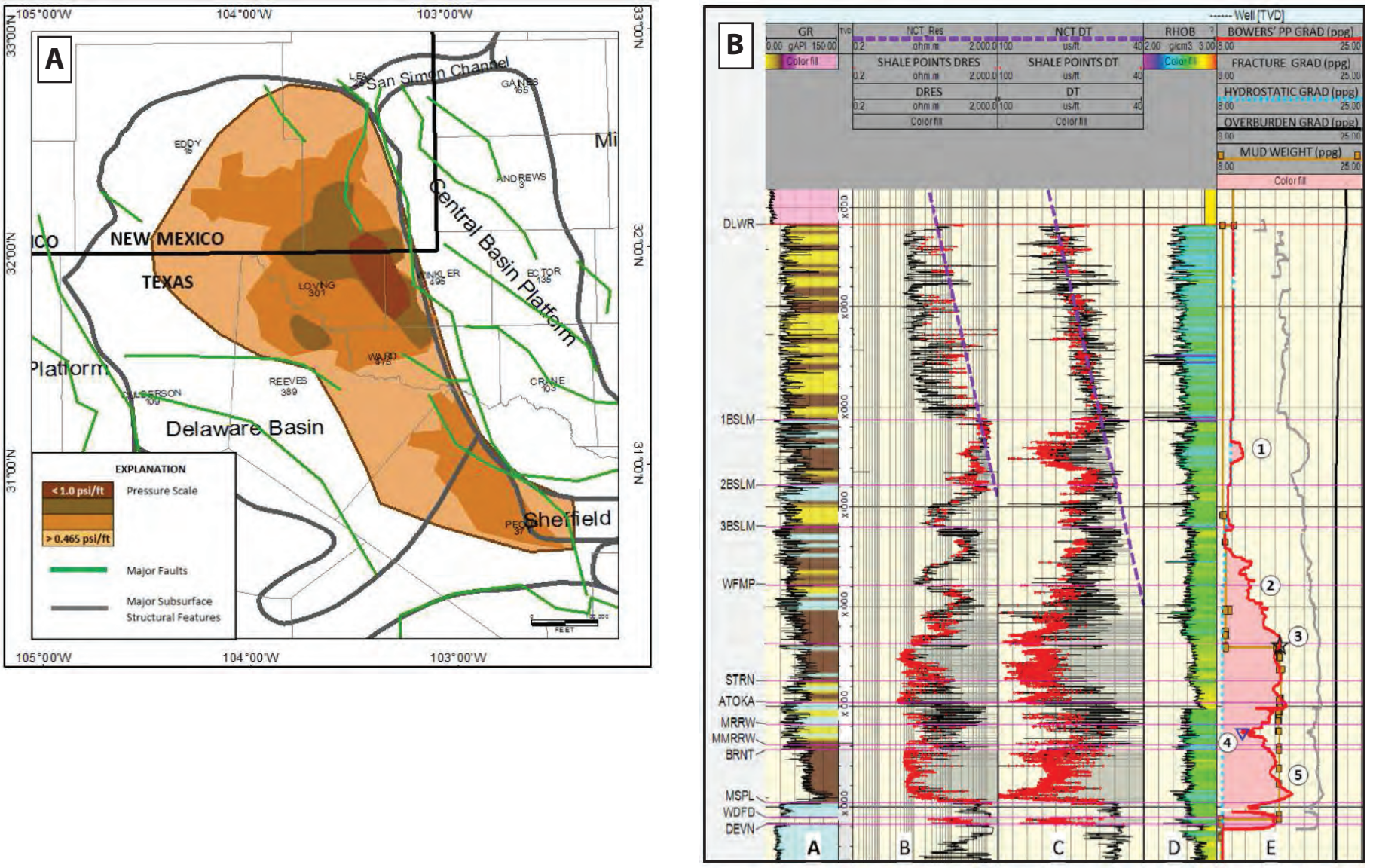
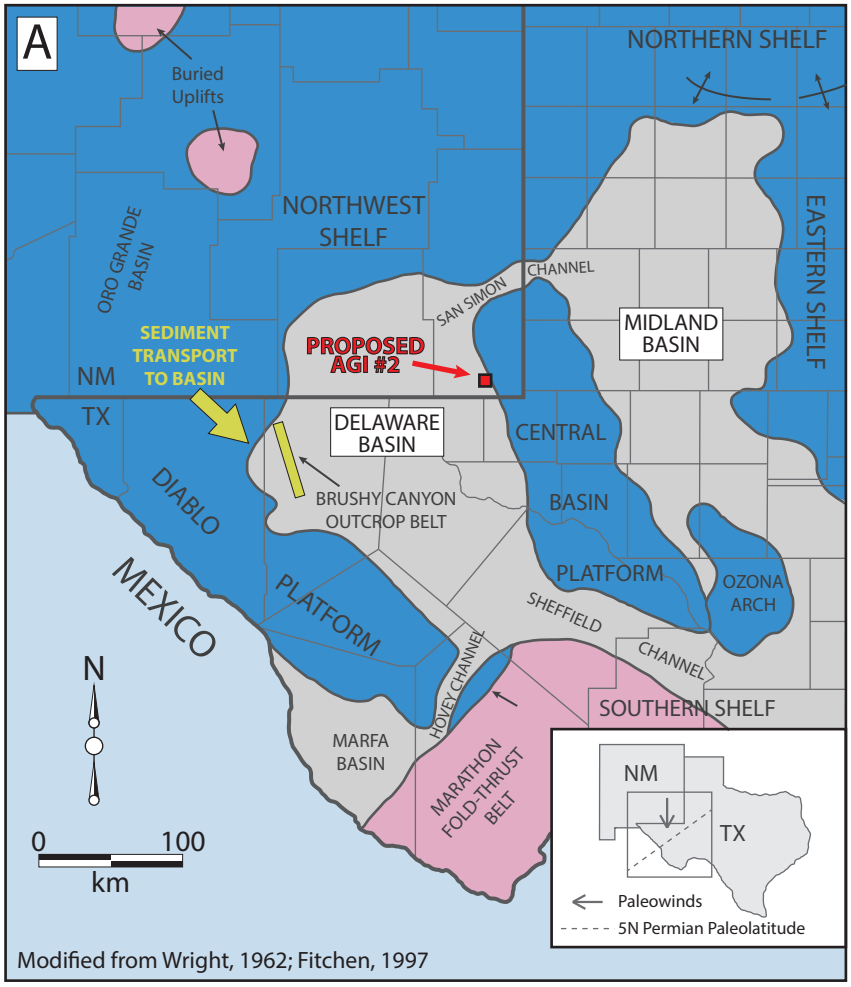


Figure 11. Mapped extent of present day overpressure in the Delaware Basin (Panel A) and example log response (Panel B) illustrating stratigraphic onset of over-pressured intervals and associated drilling fluid densities (modified from Rittenhouse et al., 2016)



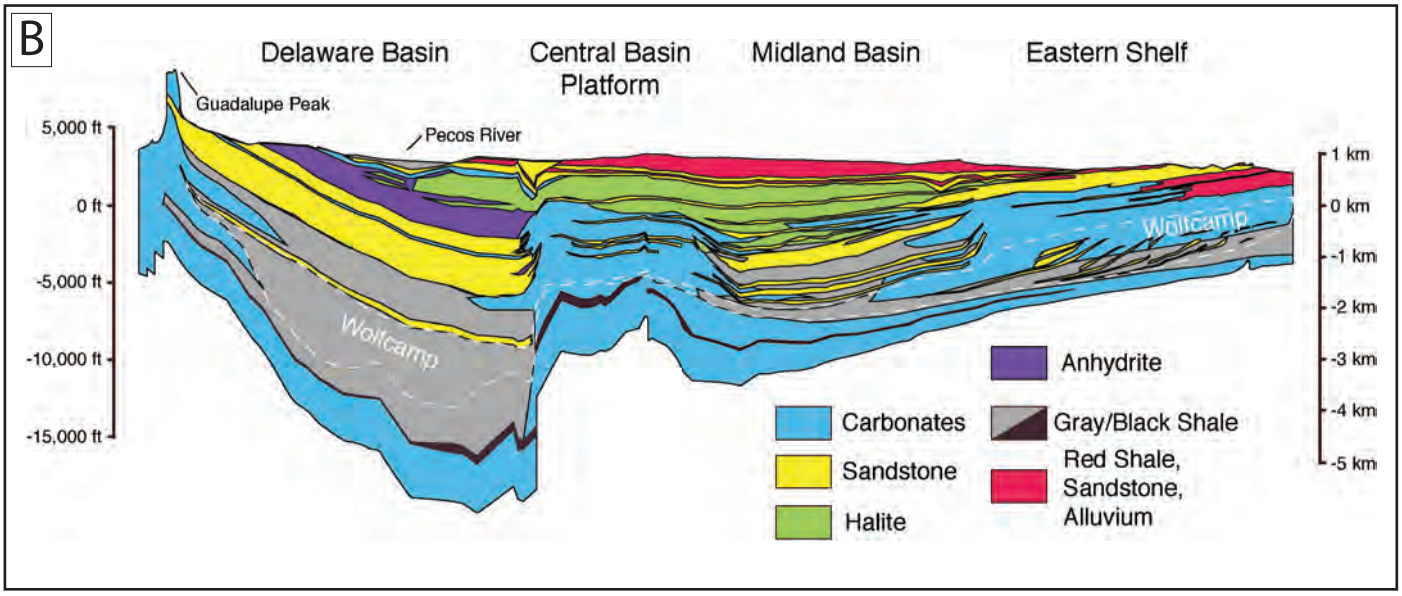


Figure 12. Structural setting (panel A) and general lithologies (panel B) of the Permian Basin

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 — BEND	(ABSENT) — BEND	(ABSENT ?) — BEND	MORROW — BEND	(ABSENT)
MISSISSIPPIAN	CHESTERIAN MERAMECIAN OSAGEAN KINDERHOOKIAN	CHESTER MERAMEC OSAGE KINDERHOOK	CHESTER MERAMEC OSAGE "BARNETT" KINDERHOOK	CHESTER MERAMEC OSAGE "BARNETT" KINDERHOOK	CHESTER MERAMEC OSAGE "BARNETT" KINDERHOOK	MERAMEC OSAGE "BARNETT" KINDERHOOK
DEVONIAN		WOODFORD DEVONIAN	WOODFORD DEVONIAN	WOODFORD DEVONIAN	WOODFORD DEVONIAN	WOODFORD DEVONIAN
SILURIAN		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	CAMBRIAN
PRECAMBRIAN						

Figure 13. General stratigraphy and producing zones (red stars) in the immediate area of Ameredev AGI #2 (modified from Yang and Dorobek, 1995)

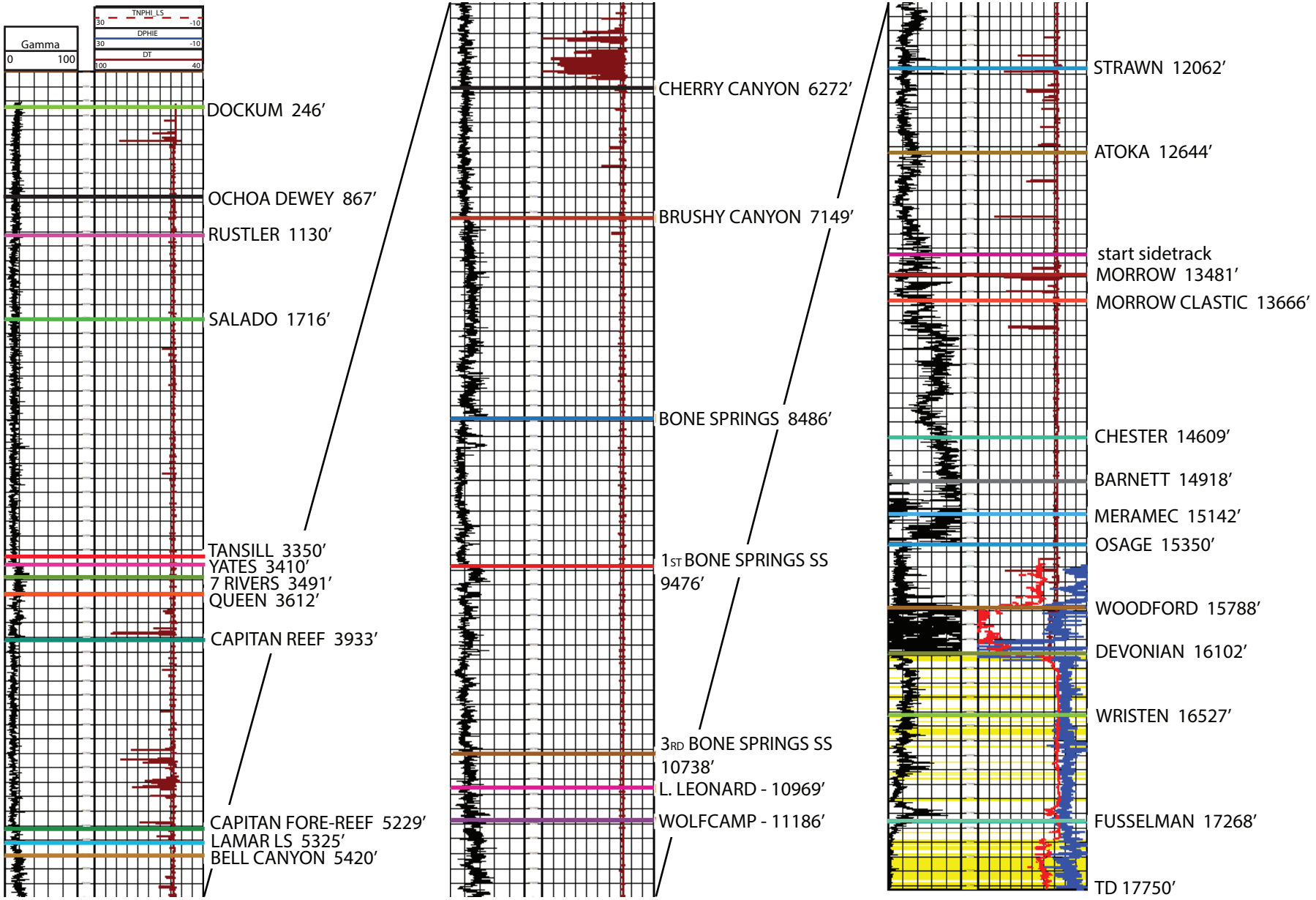


Figure 14. Type log of nearby well, Independence AGI #1 (API #30-025-48081), illustrating identified formation tops in TVD. Estimated formation tops for the proposed Independence AGI #2 are included in Table 6

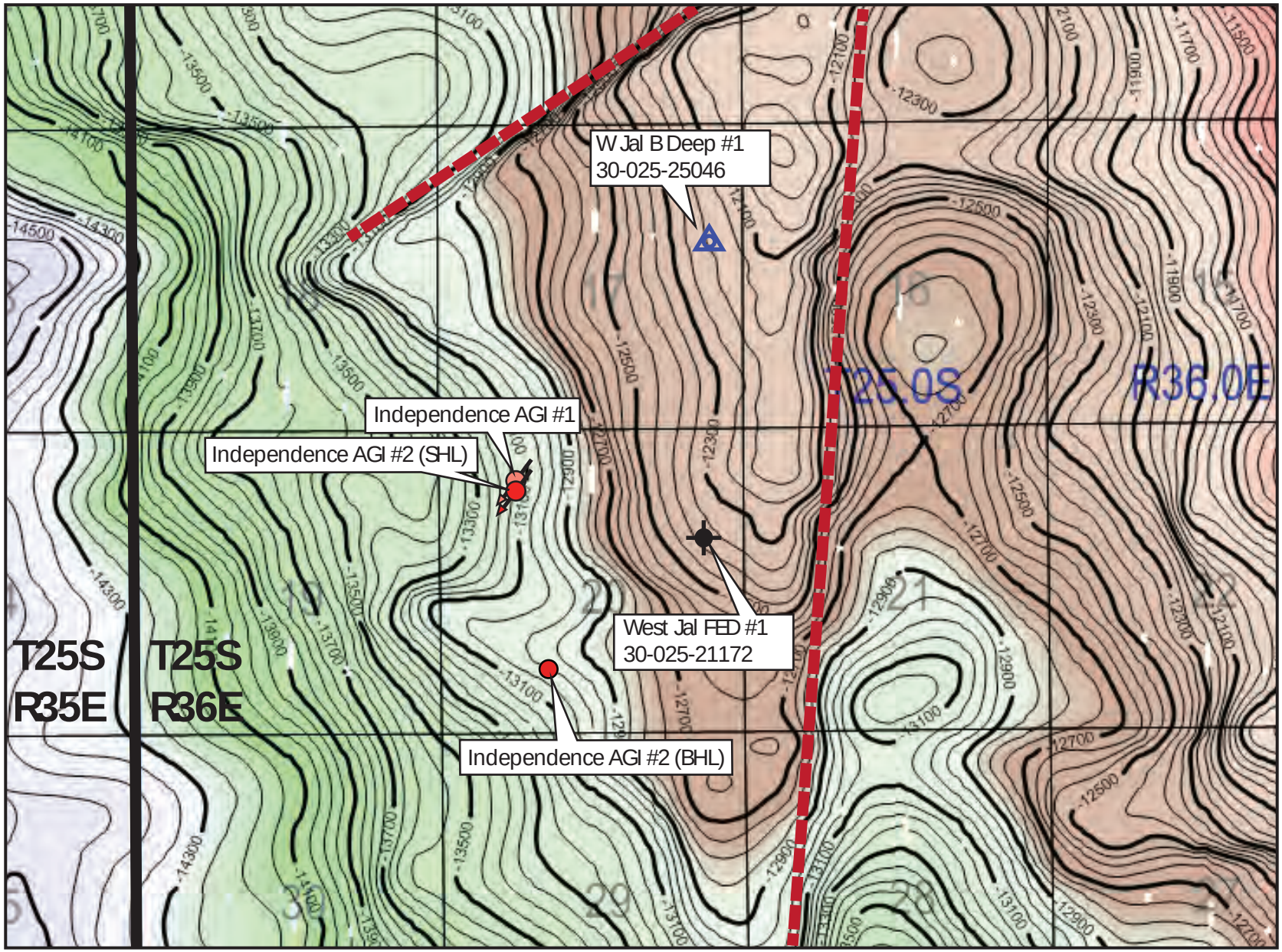


Figure 15. Structure contour map showing the top of the Siluro-Devonian target reservoir. Two faults identified in review of 3D seismic data are shown with red dashes

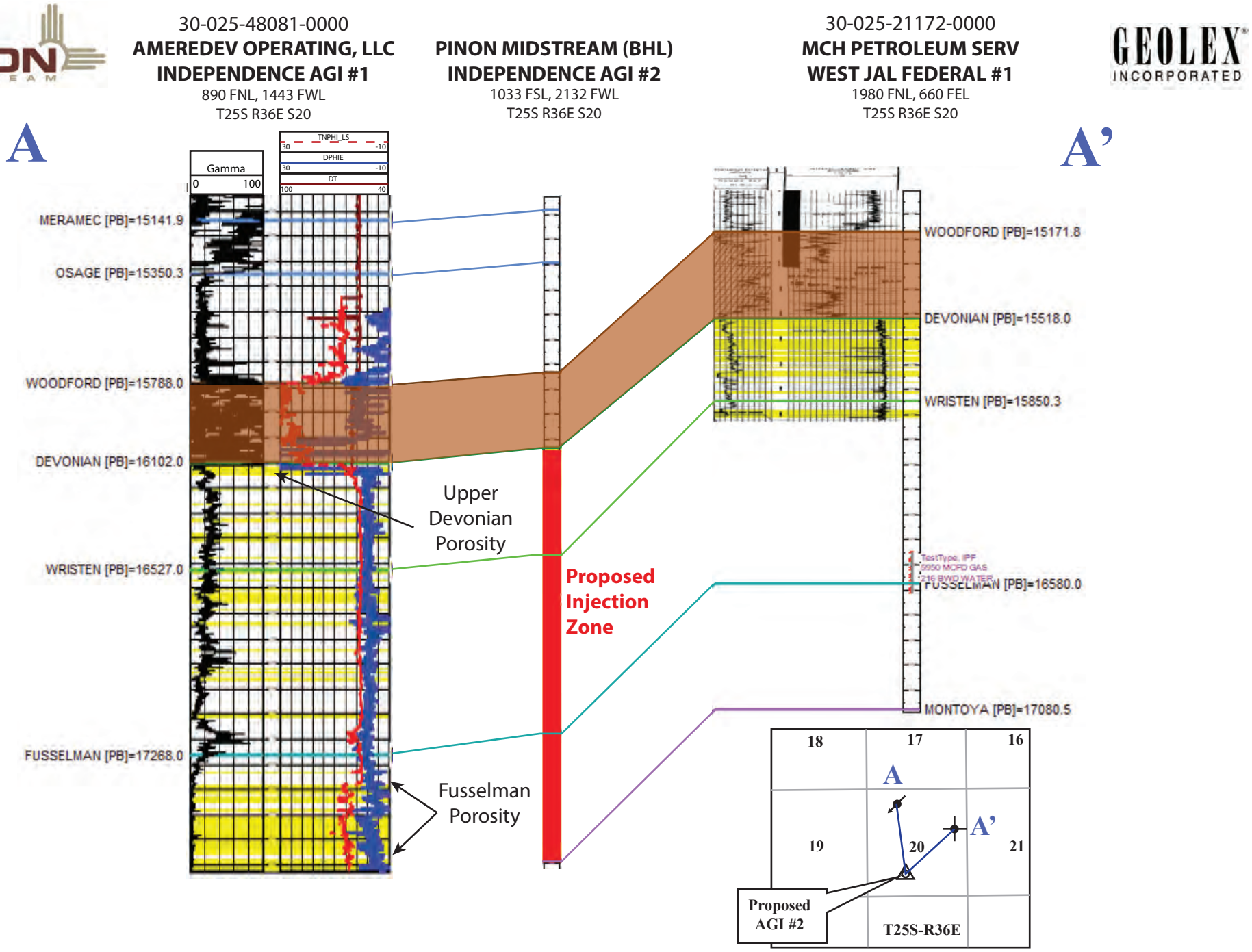


Figure 16. Structural cross-section A-A' showing porosity profile from nearby wells penetrating the proposed injection interval and regional extent of overlying Woodford Shale caprock. Proposed injecition zone from 16,080 feet TVD to 17,683 feet TVD (red bar).

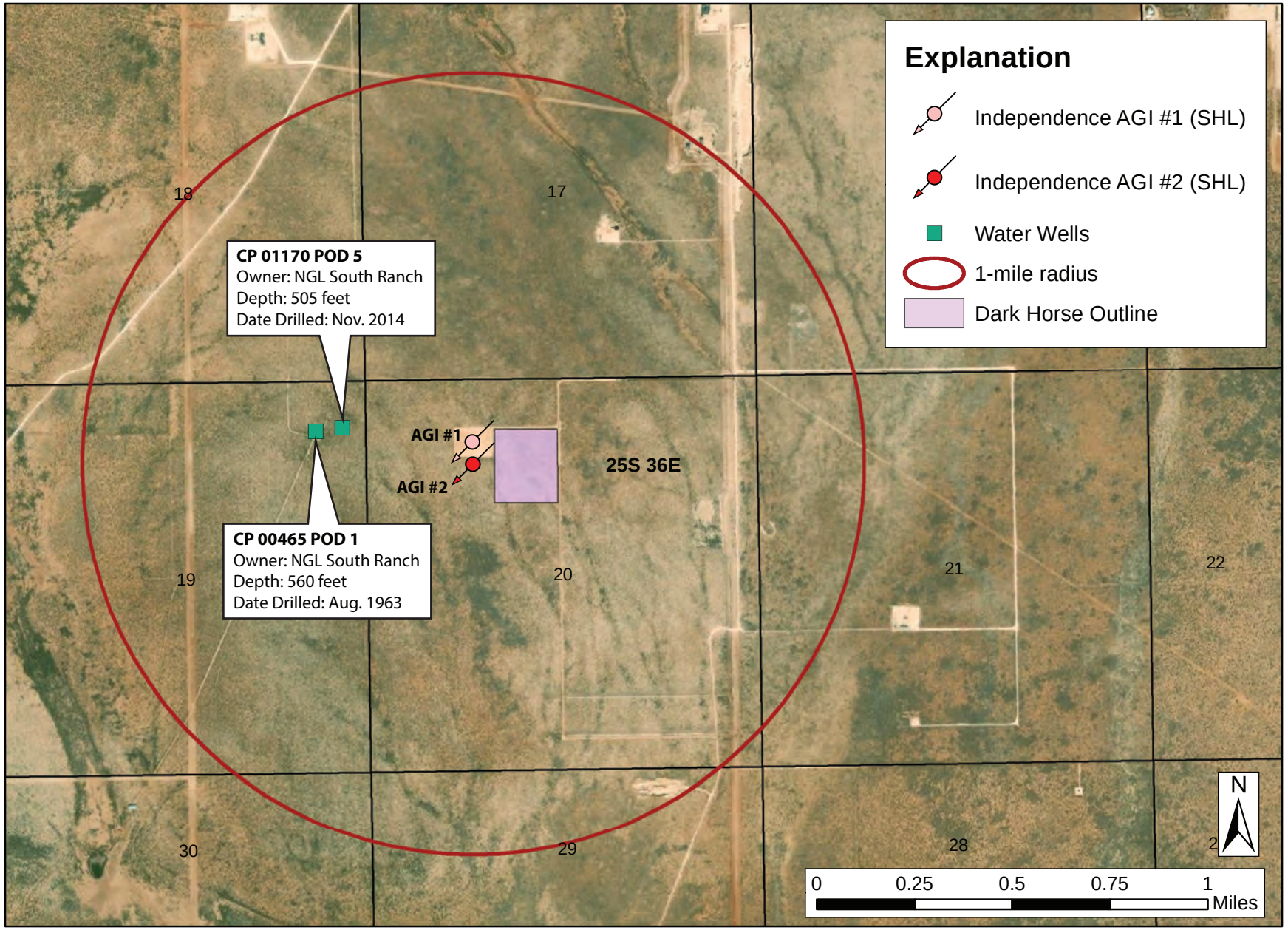


Figure 17. Water wells within one mile of the proposed Independence AGI #2 sufrace hole location (SHL)

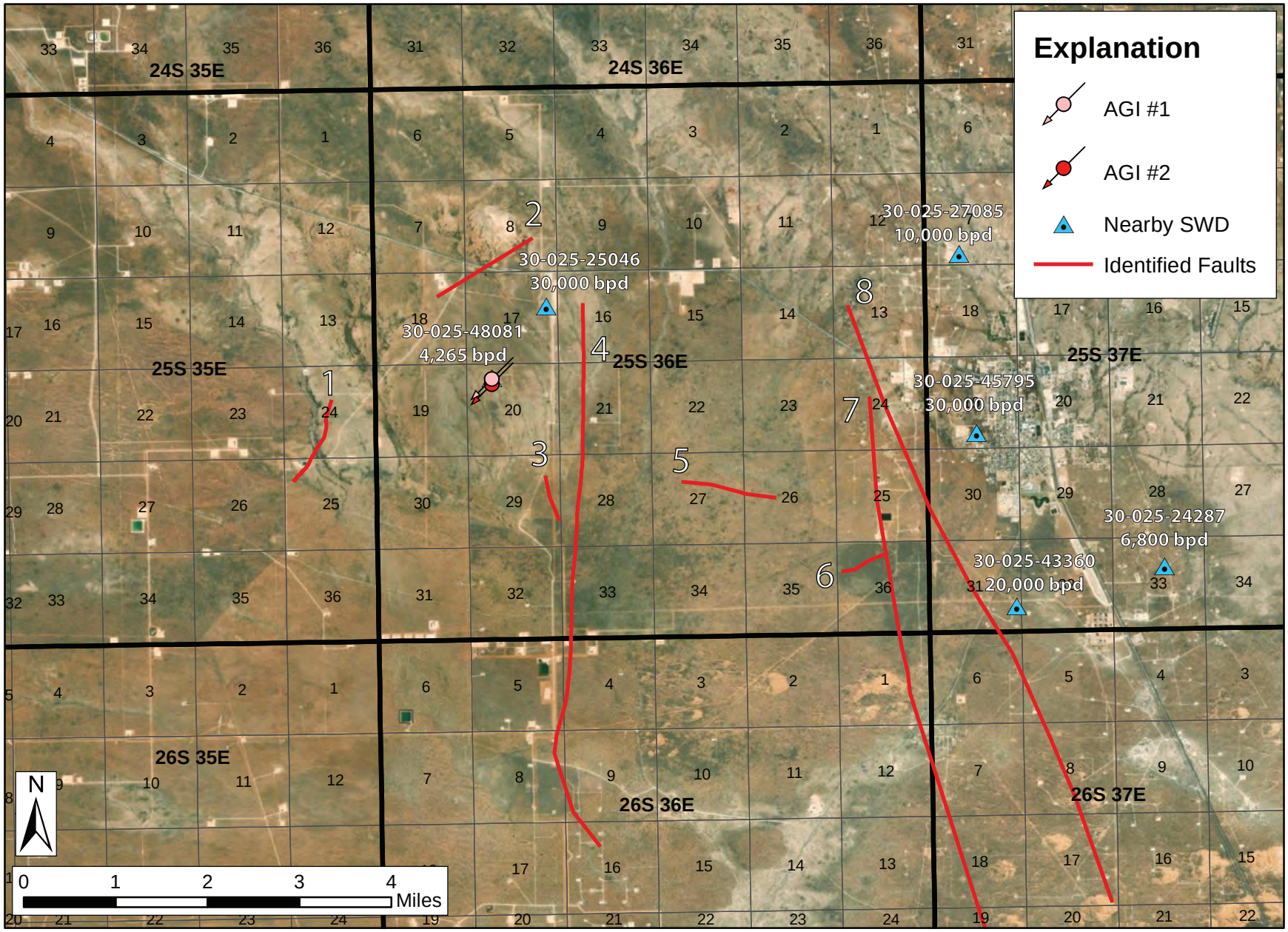
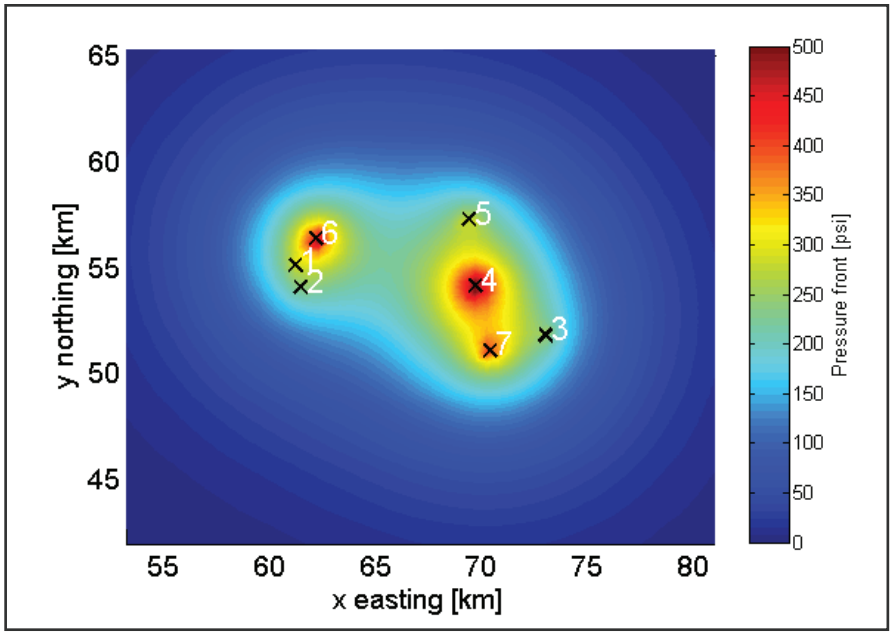
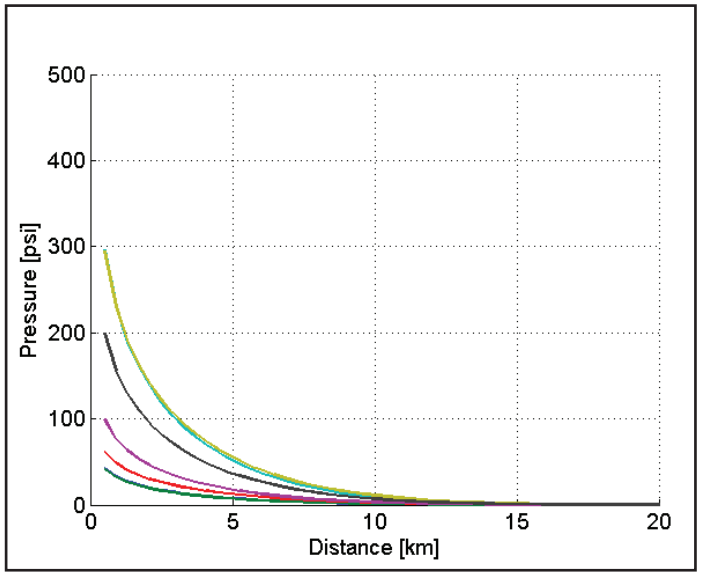


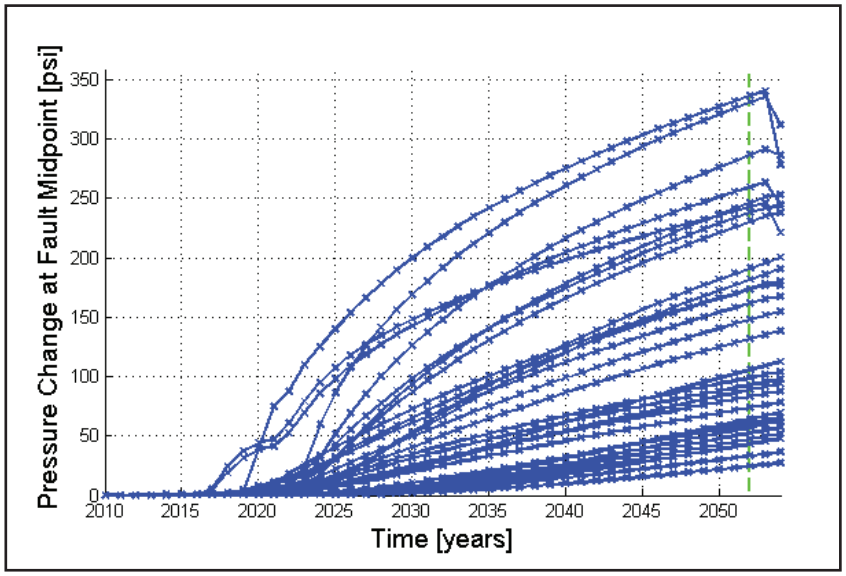
Figure 18. Siluro-Devonian injection wells and subsurface features in the vicinity of the proposed Independence AGI #2



Panel A. Resultant pressure front after 30 years of injection operations at the maximum anticipated injection rates, as reported in MNOCD records

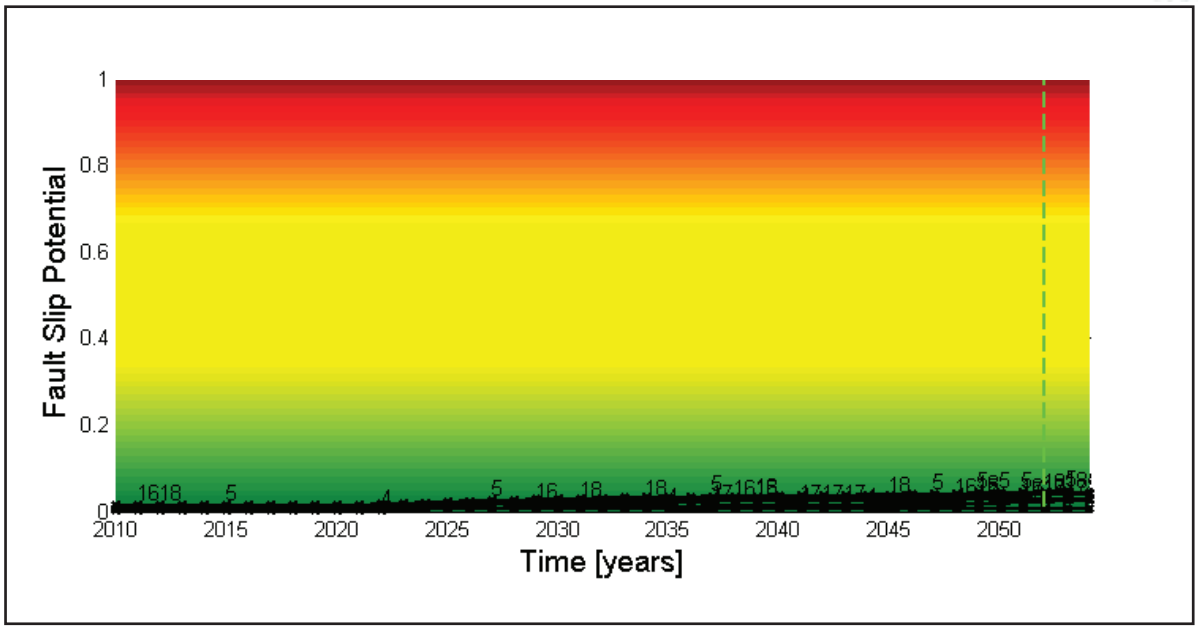


Panel B. Single well radial pressure solutions, as determined by the FSP model

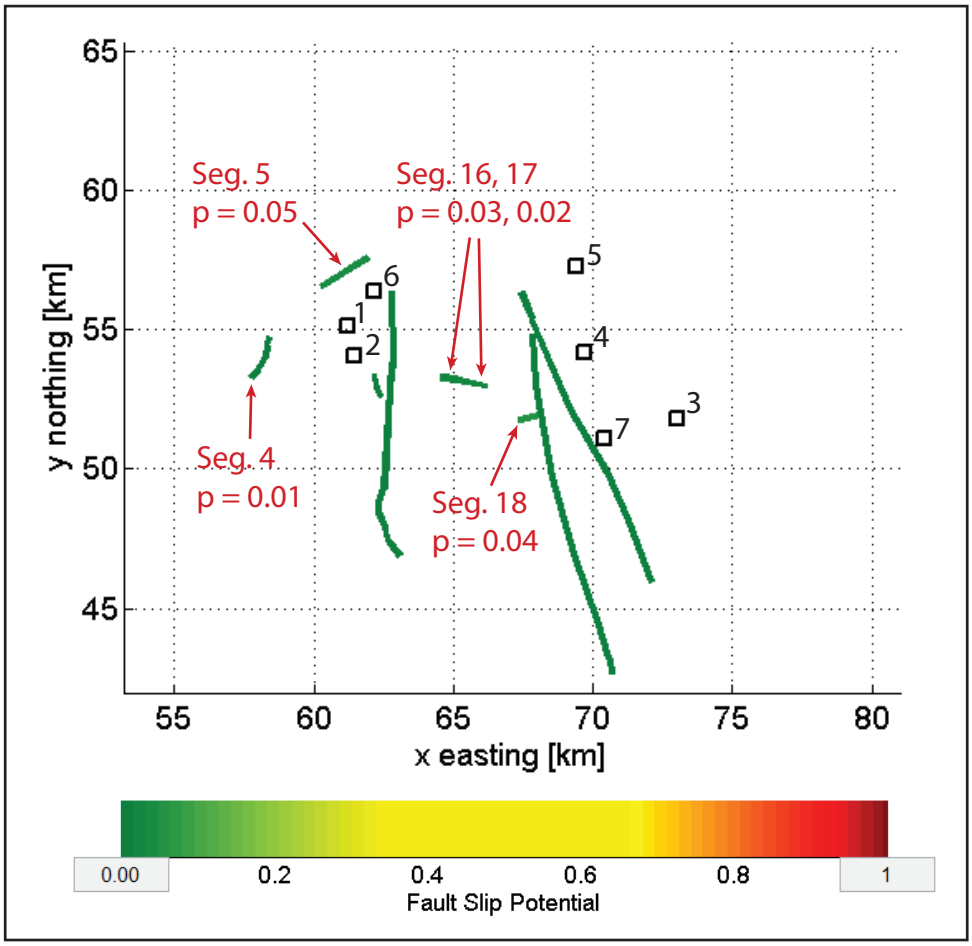


Panel C. Model-predicted pressure change through time at the midpoint of each fault segment included in the simulation

Figure 19. Summary of model-predicted pressure effects in response to the simulated seven-well injection scenario.



Panel A. Fault-slip probability throughout the entire simulated injection period. FSP model results suggest no significant risk of injection-induced slip along any feature included in the simulation.



Panel B. Map view illustrating the model-estimated slip potential of faults at the end fo the 42-year injection scenario. Any feature estimated to have a non-zero slip potential determination is labeled on the above map.

Figure 20. Summary of model-determined fault-slip probabilities over the simulated injection period (2010-2052)

APPENDIX A

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

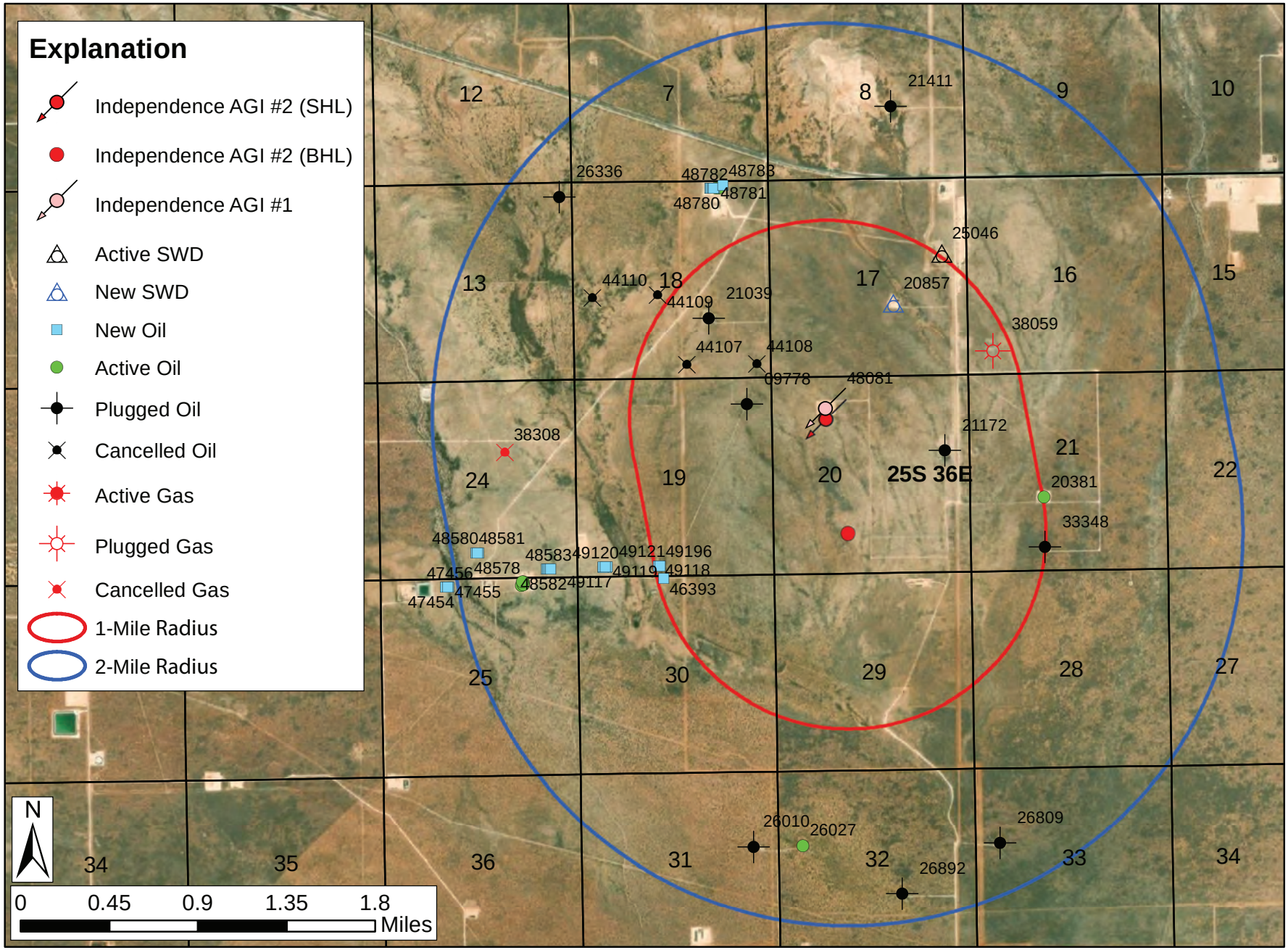


Figure A-1. All wells within two miles of the proposed Independence AGI #2. Labels denote las five digits of API #30-025-XXXXX.

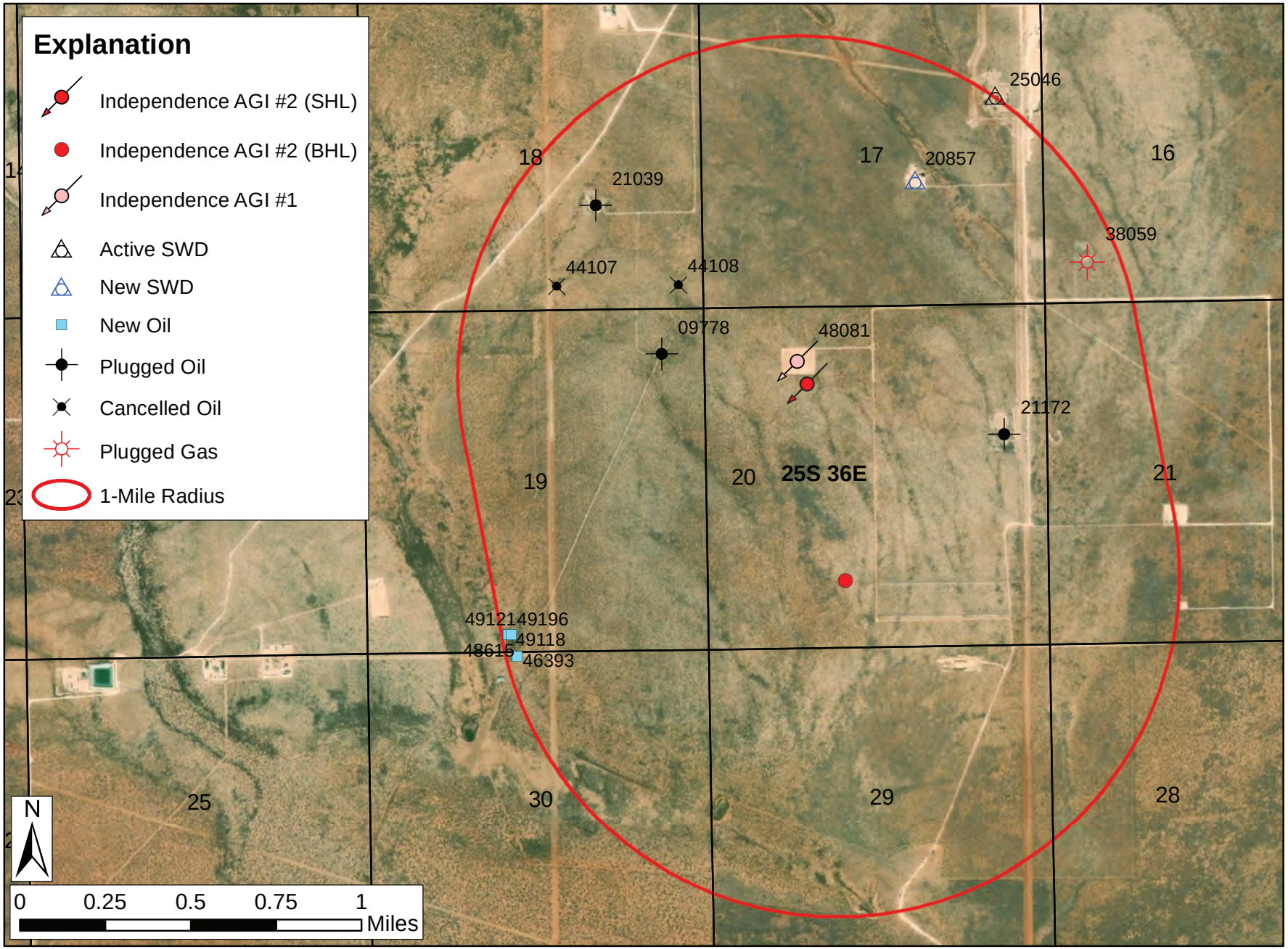


Figure A-2. All wells within one mile of the proposed Independence AGI #2. Labels denote las five digits of API #30-025-XXXXX.

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

API	Well Name	Operator	Type	Status	LAT (NAD83)	LONG (NAD83)	Associated Pool	SPUD Year	Plug Date	TVD
30-025-21172	West Jal Unit #1	Texaco Exploration & Prod.	Oil	Plugged	32.1176	-103.28074	Delaware, Strawn	-	1984	17086
30-025-38059	Dinwiddie St. COM #1	COG Operating	Gas	Plugged	32.12485	-103.27646	Strawn	2006	2008	12192
30-025-20381	Herkimer BQF FED #001H	Ameredev Operating	Oil	Active	32.11399	-103.27222	Delaware	1963	-	8515
30-025-33348	Texaco West Jal 21 #1	Enserch Exploration	Oil	Plugged	32.11036	-103.27222	-	1996	1996	7700
30-025-21039	West Jal 18 #1	Skelly Oil Co.	Oil	Plugged	32.12760	-103.30099	Wildcat	1964	1964	12950
30-025-09778	Federal #1	Edward C. Donahue	Oil	Plugged	32.12124	-103.29781	Wildcat	1959	1959	3891
30-025-26010	Spotted Tail Fed. #1	Gifford, Mitchell & Wisenbaker	Oil	Plugged	32.08862	-103.29784	Tansill, Yates, 7Riv	1978	1981	3336
30-025-26027	Sitting Bull A #1	Fulfer Oil & Cattle	Oil	Active	32.08862	-103.29358	Tansill, Yates, 7Riv	1978	-	3368
30-025-26892	Sitting Bull #2	Gifford, Mitchell & Wisenbaker	Oil	Plugged	32.08501	-103.28504	Sioux Yates	1980	1981	3746
30-025-21411	C Elliot FED #1	Texaco Exploration & Prod.	Oil	Plugged	32.14298	-103.28496	Strawn	-	1993	12276
30-025-25046	West Jal B Deep #1	BC&D Operating	SWD	Active	32.13209	-103.28071	Miss. – Fusselman	1975	-	18945
30-025-20857	West Jal B #1	BC&D Operating	SWD	New	32.12848	-103.28498	Delaware	1964	-	12275
30-025-26809	Little Hawk Federal #	Gifford, Mitchell, & Wisenbaker	Oil	Plugged	32.08861	-103.27651	Sioux Yates	1980	1981	3690
30-025-26336	Federal 13 A #1	Getty Oil Co.	Oil	Plugged	32.1367	-103.31378	Wildcat	1979	1979	3686
30-025-46393	Nandina 25 36 31 FED COM #124H	Ameredev Operating	Oil	New	32.10848	-103.30525	Wolfcamp	-	-	TBD
30-025-46561	Sioux 25 36 St FED COM #010H	Caza Operating	Oil	Active	32.10808	-103.31756	Wolfcamp	2020	-	12107
30-025-46554	Sioux 25 36 St FED COM #013H	Caza Operating	Oil	Active	32.10825	-103.3174	Wolfcamp	2020	-	11725
30-025-46553	Sioux 25 36 St FED COM #012H	Caza Operating	Oil	Active	32.10836	-103.3174	Wolfcamp	2020	-	11994
30-025-46533	Sioux 25 36 St FED COM #008H	Caza Operating	Oil	Active	32.10819	-103.3174	Wolfcamp	2019	-	12149
30-025-46551	Sioux 25 36 St FED COM #009H	Caza Operating	Oil	Active	32.10836	-103.31748	Bone Springs	2020	-	11894
30-025-46976	Black Marlin FED COM #204H	Tap Rock Operating	Oil	Active	32.13713	-103.30015	Wolfcamp	2020	-	11640
30-025-46977	Black Marlin FED COM #214H	Tap Rock Operating	Oil	Active	32.13712	-103.29999	Wolfcamp	2020	-	11741
30-025-47332	Sioux 25 36 St FED COM #002H	Caza Operating	Oil	New	32.10807	-103.324	Wolfcamp	-	-	TBD
30-025-47333	Sioux 25 36 St FED COM #003H	Caza Operating	Oil	New	32.10807	-103.32406	Wolfcamp	-	-	TBD
30-025-47454	Sioux 25 36 St FED COM #004H	Caza Operating	Oil	New	32.10807	-103.32413	Wolfcamp	-	-	TBD
30-025-47455	Sioux 25 36 St FED COM #007H	Caza Operating	Oil	New	32.10807	-103.32387	Bone Springs	-	-	TBD

30-025-47456	Sioux 25 Fed #006H	CAZA OPER., LLC	Oil	New	32.10807	-103.32394	UPR WOLFCAMP	-	-	TBD
30-025-48081	Independence AGI #1	Pinon Midstream LLC	AGI	New	32.12084	-103.29103	Devonian-Fusselman	2020	-	17750
30-025-48577	Santa Fe Fed Com #603H	Franklin Mountain Energy LLC	Oil	New	32.1093	-103.31536	Bone Spring	-	-	TBD
30-025-48578	Santa Fe Fed Com #704H	Franklin Mountain Energy LLC	Oil	New	32.11057	-103.32121	Wolfcamp	-	-	TBD
30-025-48579	Santa Fe Fed Com #705H	Franklin Mountain Energy LLC	Oil	New	32.1093	-103.31524	Wolfcamp	-	-	TBD
30-025-48580	Trinity Fed #602H	Franklin Mountain Energy LLC	Oil	New	32.11057	-103.32144	Bone Spring	-	-	TBD
30-025-48581	Trinity Fed #703H	Franklin Mountain Energy LLC	Oil	New	32.11057	-103.32132	Wolfcamp	-	-	TBD
30-025-48582	Zia Fed Com #604H	Franklin Mountain Energy LLC	Oil	New	32.1093	-103.31513	Bone Spring	-	-	TBD
30-025-48583	Zia Fed Com #706H	Franklin Mountain Energy LLC	Oil	New	32.1093	-103.31502	Wolfcamp	-	-	TBD
30-025-48614	Blue Marlin St #211H	TAP ROCK OPER., LLC	Oil	New	32.10931	-103.31019	Wolfcamp	-	-	TBD
30-025-48615	Blue Marlin St #212H	TAP ROCK OPER., LLC	Oil	New	32.1094	-103.30559	Wolfcamp	-	-	TBD
30-025-48778	Black Marlin Fed Com #113H	TAP ROCK OPER., LLC	Oil	New	32.13713	-103.30072	Bone Spring	-	-	TBD
30-025-48779	Black Marlin Fed Com #114H	TAP ROCK OPER., LLC	Oil	New	32.13713	-103.30064	Bone Spring	-	-	TBD
30-025-48780	Black Marlin Fed Com #203H	TAP ROCK OPER., LLC	Oil	New	32.13713	-103.30048	Wolfcamp	-	-	TBD
30-025-48781	Black Marlin Fed Com #206H	TAP ROCK OPER., LLC	Oil	New	32.13712	-103.30031	Wolfcamp	-	-	TBD
30-025-48782	Black Marlin Fed Com #213H	TAP ROCK OPER., LLC	Oil	New	32.13713	-103.3004	Wolfcamp	-	-	TBD
30-025-48783	Black Marlin Fed Com #216H	TAP ROCK OPER., LLC	Oil	New	32.13736	-103.2996	Wolfcamp	-	-	TBD
30-025-49115	Blue Marlin Fed Com #111H	TAP ROCK OPER., LLC	Oil	New	32.10932	-103.31048	Bone Spring	-	-	TBD
30-025-49116	Blue Marlin Fed Com #112H	TAP ROCK OPER., LLC	Oil	New	32.10939	-103.31048	Bone Spring	-	-	TBD
30-025-49117	Blue Marlin Fed Com #201H	TAP ROCK OPER., LLC	Oil	New	32.10938	-103.31022	Wolfcamp	-	-	TBD
30-025-49118	Blue Marlin Fed Com #202H	TAP ROCK OPER., LLC	Oil	New	32.1094	-103.30562	Wolfcamp	-	-	TBD
30-025-49119	Blue Marlin Fed Com #205H	TAP ROCK OPER., LLC	Oil	New	32.10938	-103.31014	Wolfcamp	-	-	TBD
30-025-49120	Blue Marlin Fed Com #211H	TAP ROCK OPER., LLC	Oil	New	32.10938	-103.3103	Wolfcamp	-	-	TBD
30-025-49121	Blue Marlin Fed Com #215H	TAP ROCK OPER., LLC	Oil	New	32.1094	-103.3057	Wolfcamp	-	-	TBD
30-025-49196	Blue Marlin Fed Com #212H	TAP ROCK OPER., LLC	Oil	New	32.1094	-103.30554	Wolfcamp	-	-	TBD

TABLE A-2. WELLS LOCATED WITHIN ONE MILE OF THE PROPOSED INDEPENDENCE AGI #2

API	Well Name	Operator	Type	Status	LAT (NAD83)	LONG (NAD83)	Associated Pools	SPUD Year	Plug Year	Vertical Depth
30-025-21172	West Jal Unit #001	Texaco Exploration & Prod.	Oil	Plugged	32.1176	-103.28074	Strawn	no data	1984	TBD
30-025-38059	Dinwiddie State Com #001	COG Operating	Gas	Plugged	32.12485	-103.27646	Strawn	2006	2008	12192
30-025-21039	West Jal 18 #1	Skelly Oil Co.	Oil	Plugged	32.12760	-103.30099	Wildcat	1964	1964	12950
30-025-09778	Federal #1	Edward C. Donahue	Oil	Plugged	32.12124	-103.29781	Wildcat	1959	1959	3891
30-025-20857	West Jal B #001	BC&D Operating	SWD	New	32.12848	-103.28498	Delaware	1964	no data	12275
30-025-46393	Nandina 25 36 31 Federal Com #124H	Ameredev Operating	Oil	New	32.10848	-103.30525	Wolfcamp	-	-	TBD
30-025-48081	Independence AGI #1	Pinon Midstream, LLC	AGI	New	32.12084	-103.29103	Devonian-Fusselman	2020	-	17750
30-025-48615	Blue Marlin State #212H	Tap Rock Operating	Oil	New	32.1094	-103.30559	Wolfcamp	-	-	TBD
30-025-49118	Blue Marlin Federal Com #202H	Tap Rock Operating	Oil	New	32.1094	-103.30562	Wolfcamp	-	-	TBD
30-025-49121	Blue Marlin Federal Com #215H	Tap Rock Operating	Oil	New	32.1094	-103.3057	Wolfcamp	-	-	TBD
30-025-49196	Blue Marlin Federal Com #212H	Tap Rock Operating	Oil	New	32.1094	-103.30554	Wolfcamp	-	-	TBD
30-025-25046	West Jal B Deep #1	BC&D Operating	SWD	Active	32.13209	-103.28071	Miss. – Fusselman	1975	-	18945

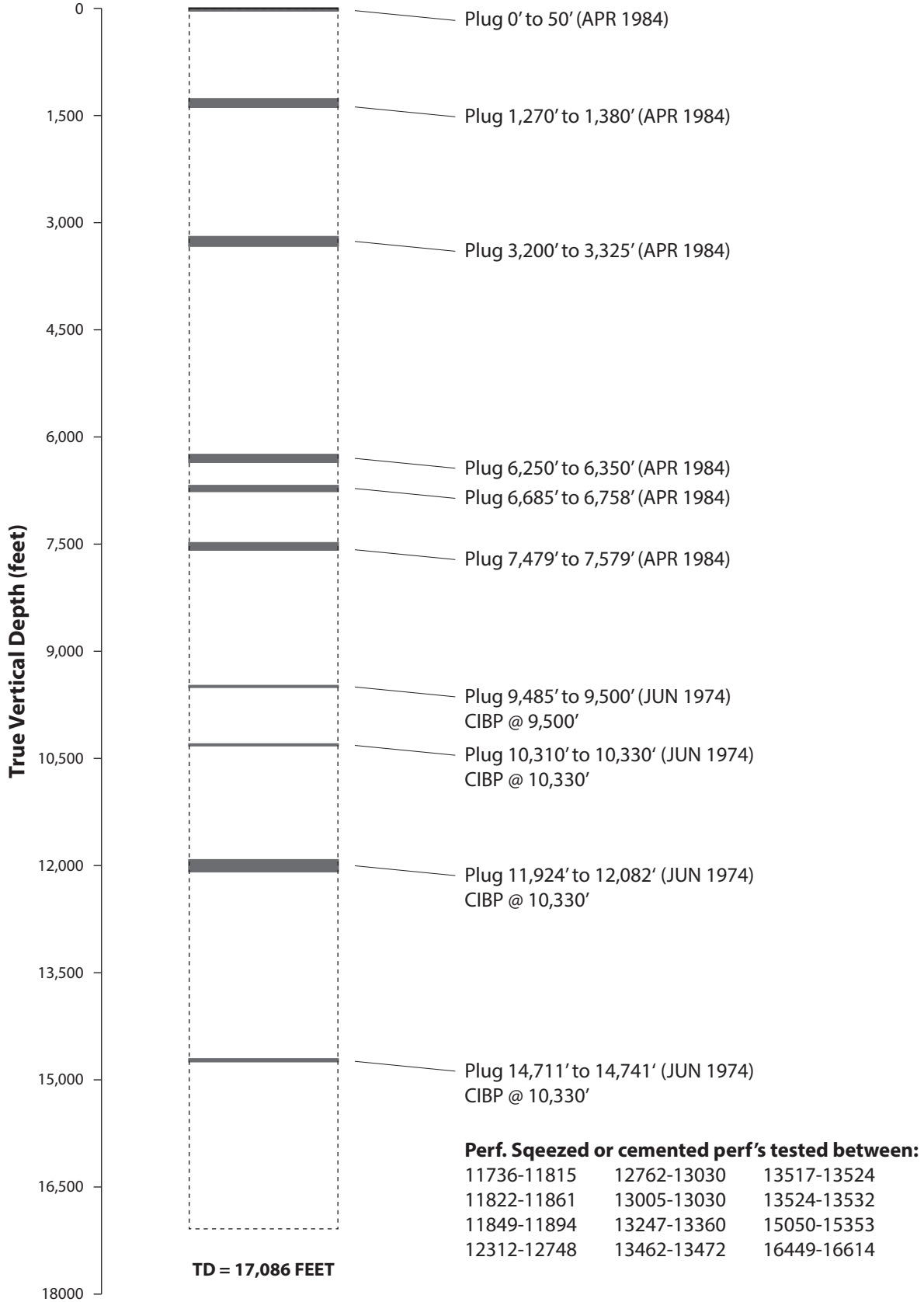
WEST JAL UNIT #1
(API 30-025-21172)

RELEVANT PLUGGING DOCUMENTS
(Retrieved from NMOCD records)

NOTE: Plugging diagram generated from description of plugging operations reported in available NMOCD records

TEXACO EXPLORATION AND PROD. - WEST JAL UNIT #1 PLUGGING DIAGRAM

Lease Name:	West Jal Unit #1	**Footage:**	1980 FNL and 660 FEL
API:	30-025-21172	**Well Type:**	Oil
Location:	Sec. 20, T25S, R36E	**Total Depth:**	17,086'
County, State:	Lea County, New Mexico	**Coordinates:**	32.117596, -103.280739 (NAD83)



Perf. Sqeezed or cemented perf's tested between:

11736-11815	12762-13030	13517-13524
11822-11861	13005-13030	13524-13532
11849-11894	13247-13360	15050-15353
12312-12748	13462-13472	16449-16614

*Schematic is properly scaled

N. M. OIL CONS. COMMISSION
P. O. BOX 1980
HOBBS, NEW MEXICO 88240

L-31

orm 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals

SUBMIT IN TRIPLICATE

5. Lease Designation and Serial No.: NM 71792

6. If Indian, Allottee or Tribe Name:

7. If Unit or CA, Agreement Designation:

1. Type of Well: [X] Oil Well [ ] Gas Well [X] Other Reentry

8. Well Name and No.: West Jal Federal #1

2. Name of Operator: MCH Petroleum Services

9. API Well No.: 30-025-21172

3. Address and Telephone No.: 708 W. Pine St. Midland, Tx 79705 915 683 4772

10. Field and Pool, or Exploratory Area: ~~Undesignated~~ W. Jal Delaware

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
1980' FNL 660' FEL Sec 20, T-25S, R-36E
H SENE Lea Co., NM

11. County or Parish, State: LEA, NM

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

TYPE OF SUBMISSION	TYPE OF ACTION	
[X] Notice of Intent	[ ] Abandonment	[ ] Change of Plans
[ ] Subsequent Report	[X] Recompletion	[ ] New Construction
[ ] Final Abandonment Notice	[ ] Plugging Back	[ ] Non-Routine Fracturing
	[ ] Casing Repair	[ ] Water Shut-Off
	[ ] Altering Casing	[ ] Conversion to Injection
	[X] Other Reentry	[ ] Dispose Water

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

13. 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.)*

MCH Petroleum Services proposes to reenter existing well originally drilled by Skelly Oil Company in 1961 and plug and abondoned by Texaco in 1983. MCH will drill out cement plugs and cibp @ 7,579' to a total depth of approx. 8,350' (inside casing). This will leave in place cibp at 9,500' and deeper. We will then test existing perforations @ 7,807'-7,857' and stimulate as necessary.

Mud Program: Fresh water will be used for the reentry inside casing.

BOP Program: BOP will be installed at the beginning and tested daily.

APPROVAL SUBJECT TO
GENERAL REQUIREMENTS AND
SPECIAL STIPULATIONS
ATTACHED

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

Signed Mary Huber Title Owner Date 4/13/93

(This space for Federal or State office use)

Approved by /ORIG. SGD.) RICHARD L. MANUS Title AREA MANAGER Date JUN 4 1993

Conditions of approval, if any:

Title 18 U.S.C. Section 1001, makes 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.

*See Instruction on Reverse Side

Form 3160-3
(December 1990)

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 1004-0136
Expires: December 31, 1991

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR DEEPEN

1a. TYPE OF WORK: DRILL ☐ DEEPEN ☐

b. TYPE OF WELL: OIL WELL ☒ GAS WELL ☐ OTHER Reentry SINGLE ZONE ☒ MULTIPLE ZONE ☐

2. NAME OF OPERATOR: MCH Petroleum Services

3. ADDRESS AND TELEPHONE NO.: 708 W. Pine St. Midland, Tx 79705 915 683 4772

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*)
At surface: 1980' FNL, 660' FEL Sec 20 T-25S, R-36E Lea Co. NM
At proposed prod. zone: Same H SENE

5. LEASE DESIGNATION AND SERIAL NO.: NM 71792

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

7. UNIT AGREEMENT NAME:

8. FARM OR LEASE NAME, WELL NO.: West Jal Federal #1

9. API WELL NO.: 30-025-21172

10. FIELD AND POOL, OR WILDCAT: [redacted] W. Jal Delaware

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: S-20, T-25S, R-36E

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*: 6 miles W. Jal, N.M.

12. COUNTY OR PARISH: Lea | 13. STATE: NM

15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any): 660'

16. NO. OF ACRES IN LEASE: 600

17. NO. OF ACRES ASSIGNED TO THIS WELL: 40

18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT.:

19. PROPOSED DEPTH: 8350

20. ROTARY OR CABLE TOOLS: Pulling unit / Reverse unit

21. ELEVATIONS (Show whether DF, RT, GR, etc.): 3076' GL

22. APPROX. DATE WORK WILL START: ASAP (Prior to 6/1/93 exp.)

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	GRADE, SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
26	20		869' (In Place)	1630 sx.
17 1/2	13 3/8	72, 68, 64	6300' (In Place)	3606 sx.
12 1/4	9 5/8	53.5, 47, 43.5	11,736 (In Place)	775 sx.
8 3/8	7	26	6735-12213 (Shot off @ 6735)	612 sx
6 1/4	5 1/2 (LNR.)	(unk.)	12,032-15,400	450 sx.
(unk)	3 1/2 (LNR.)	(unk.)	14,967-17,084	250 sx.

MCH Petroleum Services proposes to reenter existing well originally drilled by Skelly Oil Company in 1961 and plug and abondoned by Texaco in 1983. MCH will drill out cement plugs and cibp @ 7,579' to a total depth of approx. 8,350'(inside casing). This will leave in place cibp at 9,500' and deeper. We will then test existing perforations @ 7,807'-7,857' and stimulate as necessary.

Mud Program: Fresh water will be used for the reentry inside casing.

BOP Program: BOP will be installed at the beginning and tested daily.

APPROVAL SUBJECT TO GENERAL REQUIREMENTS AND SPECIAL STIPULATIONS ATTACHED

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

24.

SIGNED Craig Huber TITLE Owner DATE 4/13/93

(This space for Federal or State office use)

PERMIT NO. _____ APPROVAL DATE _____

Application approval 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.

CONDITIONS OF APPROVAL, IF ANY:

APPROVED BY _____ TITLE _____ DATE _____

*See Instructions On Reverse Side

Title 18 U.S.C. Section 1001, makes 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.

Form 3160-5
(November 1983)
(Formerly 9-331)

Form approved.
Budget Bureau No. 1004-0135
Expires August 31, 1985

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPLICATE* (Other instructions on reverse side)

P.O. BOX 1980
HOBBS, NEW MEXICO 88240

5. LEASE DESIGNATION AND SERIAL NO.
NM-03429A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

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—" for such proposals.)

1. OIL WELL [X] GAS WELL [ ] OTHER

7. UNIT AGREEMENT NAME
West Jal Unit

2. NAME OF OPERATOR
Getty Oil Company

8. FARM OR LEASE NAME

3. ADDRESS OF OPERATOR
P.O. Box 730, Hobbs, NM 88240

9. WELL NO.
1

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.)
At surface
Unit Ltr. H, 1980' FNL & 660' FEL

10. FIELD AND POOL, OR WILDCAT
West Jal Delaware

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec. 20, T-25S, R-36E

BUREAU OF LAND MGMT. APR 7 DIST. 6 N. M. ROSWELL, NEW MEXICO

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)
3138' D.F.

12. COUNTY OR PARISH
Lea

13. STATE
NM

16. 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*	XX
REPAIR WELL	[ ]	CHANGE PLANS	[ ]	(Other)			
(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.)*

3/26/84 Rigged up. Pulled rods and pump. Unseat tbg. anchor and install BOP.

3/28/84 Pulled 2 7/8" buttress & 2 3/8" tbg. anchor. Ran 7" CI plug, set @ 7579'. Ran 2 3/8" to 4290'. By Halliburton, circ. 191 bbls. gel brine, pulled tbg. Perfs 4-0.25" holes @ 6400'. Circ. out 7" between 9 5/8". Ran 2 7/8" to 7554'.

3/29/84 Rigged up csg. puller unit. Pulled tbg. Remove BOP & 7" tbg. spool.

3/30/84 Weld 7" pull nipple. Cut 7" csg. @ 6735'. Pulled 11 jts 7", 26#, P-110 csg. 8 rd.

3/31/84 Layed down total 163 jts (est. 6525') 7", 8rd casing. Nipple down 9 5/8" head.

4/2/84 Weld on 9 5/8" pulled nipple. Attempted to pull slips with 500,000#. Set off primer cord around head, no movement. Left soaking in penetrating oil.

4/3/84 Dug out 13 3/8" csg. unflange head. Move pipe 1" with 600,000#. Cut off. Pulled nipple, installed BOP. Ran tbg to 5216'.

4/4/84 Spot 20 sxs cement on top of CIBP 7579-7479'. Spot 100' plug (45 sxs) at 6758-6685', 6350-6250', 3325-3200', 1380-1270'. Remove csg. head.

4/5/84 Rigged down. Installed 20 sxs. Plugged 0-50'. Installed dry hole marker. P&A.

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

SIGNED Donald J. Steinmetz TITLE Area Superintendent DATE April 11, 1984

for Dale R. Crockett
(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE 6-8-87

CONDITIONS OF APPROVAL, IF ANY:

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

0+6-BLM-Roswell 1-Mr. J.A.-Midland
1-File 1-Laura Richardson-Midland
1-Engr Jim 1-BB, 1-JA
1-Foreman CK 1-SH, 1-CP 1-Southland Royalty Company, 1-ARCO

*See Instructions on Reverse Side

Title 18 U.S.C. Section 1001, makes 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.

N. M. OIL CONS. COMMISSION
P. O. BOX 1980
HOBBS, NEW MEXICO 88240

O+6 - BLM - P.O. Box 1857, Roswell, 1-File, 1-Engr.JIM, 1-Foreman CK

Form 9-331 Dec. 1973

1 - Laura Richardson-Midland

Form Approved.
Budget Bureau No. 42-R1424

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

BUREAU OF LAND MANAGEMENT RECEIVED JUL 25 1983 ROSWELL, NEW MEXICO DIST. 6 N. M.

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 Form 9-331-C for such proposals.)

1. oil well XX gas well ☐ other

2. NAME OF OPERATOR
Getty Oil Company

3. ADDRESS OF OPERATOR
P.O. Box 730 Hobbs, NM 88240

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: Unit ltr. H, 1980' FNL & 660 FEL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH:

5. LEASE
NM-03429A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME
West Jal Unit

9. WELL NO.
1

10. FIELD OR WILDCAT NAME
West Jal Delaware

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec. 20, 25S-36E

12. COUNTY OR PARISH
Lea

13. STATE
NM

14. API NO.

15. ELEVATIONS (SHOW DF, KDB, AND WD)
3138' D.F.

16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

REQUEST FOR APPROVAL TO:		SUBSEQUENT REPORT OF:
TEST WATER SHUT-OFF	☐	☐
FRACTURE TREAT	☐	☐
SHOOT OR ACIDIZE	☐	☐
REPAIR WELL	☐	☐
PULL OR ALTER CASING	☐	☐
MULTIPLE COMPLETE	☐	☐
CHANGE ZONES	☐	☐
ABANDON*	XX	☐
(other) Revised		

(NOTE: Report results of multiple completion or zone change on Form 9-330.)

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.)*

Revised procedure as per conversation with Mr. Peter Chester 7/18/83:

1. Install B.O.P.
2. Set C.I.B.P. at +7860 w/35' cement on top.
3. Perforate 2 holes @ 6375' & squeeze with sufficient cement to bring cement to 6225'.
4. Set cement plug 1230-1330' top of salt. (in & behind casing).
5. Set 50' surface plug.
6. Install dry hole marker.
7. Restore location.

Subsurface Safety Valve: Manu. and Type _____ Set @ _____ Ft.

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

SIGNED ~~Dale R. Crockett~~ TITLE Area Superintendent DATE July 22, 1983

APPROVED

(This space for Federal or State office use)

(Orig. Sgd.) M. CHESTER
APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

SEP 14 1983

*See Instructions on Reverse Side

Form 9-330
(Rev. 5-63)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN DUPLICATE (See other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R355.5.

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

1a. TYPE OF WELL: OIL WELL [X] GAS WELL [ ] DRY [ ] Other

b. TYPE OF COMPLETION: NEW WELL [ ] WORK OVER [ ] DEEP-EN [ ] PLUG BACK [X] DIFF. RESVR. [X] Other

2. NAME OF OPERATOR: Shelly Oil Company

3. ADDRESS OF OPERATOR: P. O. Box 1351, Midland, Texas 79701

4. LOCATION OF WELL (*Report location clearly and in accordance with any State requirements*)*
At surface: Unit Letter H, 1880' FNL and 660' FEL, Sec. 20-25S-36E
At top prod. interval reported below
At total depth

5. LEASE DESIGNATION AND SERIAL NO.: NM-03429-A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: - - - - - -

7. UNIT AGREEMENT NAME: - - - - - -

8. FARM OR LEASE NAME: West Jal Unit

9. WELL NO.: 1

10. FIELD AND POOL, OR WILDCAT: Jal Delaware, West UNDESIGNATED

11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA: Sec. 20-25S-36E

14. PERMIT NO. | DATE ISSUED

12. COUNTY OR PARISH: Lea | 13. STATE: New Mexico

15. DATE SPUDDED	16. DATE T.D. REACHED	17. DATE COMPL. (*Ready to prod.*)	18. ELEVATIONS (DF, RKB, RT, GR, ETC.)*	19. ELEV. CASINGHEAD
- -	- -	5-26-74	3138' DF	- - -

20. TOTAL DEPTH, MD & TVD	21. PLUG, BACK T.D., MD & TVD	22. IF MULTIPLE COMPL., HOW MANY*	23. INTERVALS DRILLED BY	ROTARY TOOLS	CABLE TOOLS
17086'	9485' PBTD	- -	→	- -	- -

24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)*: 7807-7857' Delaware

25. WAS DIRECTIONAL SURVEY MADE: - - -

26. TYPE ELECTRIC AND OTHER LOGS RUN: None

27. WAS WELL CORED: - -

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

CASING SIZE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
No Change					

29. LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)
-	-	-	-	-
-	-	-	-	-

30. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)
2-3/8" OD	7941'	- -
2-7/8" OD		- -

31. PERFORATION RECORD (*Interval, size and number*)
7807-7811', 7816-7818', 7853-7857', total 32 shots, 0.50" diameter, two shots per foot.

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

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
7807-7857'	750 gallons mud acid 5000 gallons 15% NE acid, 82 ball sealers, 90000# 20-40 sand, 9000 gallons loose oil

33.* PRODUCTION

DATE FIRST PRODUCTION	PRODUCTION METHOD (*Flowing, gas lift, pumping—size and type of pump*)	WELL STATUS (*Producing or*)
5-28-74	Pumping	Producing

DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD →	OIL—BBL.	GAS—MCF.	WATER—BBL.	GAS-OIL RATIO
6-19-74	24	*		63	1	6	16

FLOW. TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUR RATE →	OIL—BBL.	GAS—MCF.	WATER—BBL.	OIL GRAVITY-API (CORR.)
- -	68#		63	1	6	41*

34. DISPOSITION OF GAS (*Sold, used for fuel, vented, etc.*): Used for Fuel — TEST WITNESSED BY

35. LIST OF ATTACHMENTS: None

36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records

SIGNED (Signed) D. R. Crow D. R. Crow TITLE Lead Clerk DATE 6-20-74

*(See Instructions and Spaces for Additional Data on Reverse Side)

INSTRUCTIONS

General: This form is designed for submitting a complete and correct well completion report and log on all types of lands and leases to either a Federal agency or a State agency, or both, pursuant to applicable Federal and/or State laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from, the local Federal and/or State office. See instructions on items 22 and 24, and 33, below regarding separate reports for separate completions.

If not filed prior to the time this summary record is submitted, copies of all currently available logs (drillers, geologists, sample and core analysis, all types electric, etc.), formation and pressure tests, and directional surveys, should be attached hereto, to the extent required by applicable Federal and/or State laws and regulations. All attachments should be listed on this form, see item 35.

Item 4: If there are no applicable State requirements, locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local State or Federal office for specific instructions.

Item 18: Indicate which elevation is used as reference (where not otherwise shown) for depth measurements given in other spaces on this form and in any attachments.

Items 22 and 24: If this well is completed for separate production from more than one interval zone (multiple completion), so state in item 22, and in item 24 show the producing interval, or intervals, top(s), bottom(s) and name(s) (if any) for only the interval reported in item 33. Submit a separate report (page) on this form, adequately identified, for each additional interval to be separately produced, showing the additional data pertinent to such interval.

Item 29: *"Sacks Cement":* Attached supplemental records for this well should show the details of any multiple stage cementing and the location of the cementing tool.

Item 33: Submit a separate completion report on this form for each interval to be separately produced. (See instruction for items 22 and 24 above.)

37. SUMMARY OF POROUS ZONES:
SHOW ALL IMPORTANT ZONES OF POROSITY AND CONTENTS THEREOF; CORED INTERVALS; AND ALL DRILL-STEM TESTS, INCLUDING DEPTH INTERVAL TESTED, CUSHION USED, TIME TOOL OPEN, FLOWING AND SHUT-IN PRESSURES, AND RECOVERIES

FORMATION	TOP	BOTTOM	DESCRIPTION, CONTENTS, ETC.
			1) Squeezed Pseudman perfs. 16,449-16,614' with 100 sacks Class "H" cement, 5/10% CFR-2. 2) Spotted 25 sacks cement 14,711-14,741', 25 sacks 11,924-12,082' and set cast iron bridge plug at 10,330' and spotted 4 sacks cement 10,310-10,330'. 3) Perforated 7" OD casing in First Bone Springs formation with two 0.48 diameter holes per foot at 10,112-10,122' and 10,128-10,132'. (28 shots total) 4) Treated First Bone Springs perfs. 10,112-10,132 with 5500 gallons acid and 68 ball sealers. 5) Swab tested First Bone Springs perfs. 10,112-10,132' May 14, 1974, to May 21, 1974, for no oil, 14 bbls. water and slight show of gas in 5 hours. 6) Set cast iron bridge plug at 9500' and cemented with 3 sacks cement plugging back to 9485'. 7) Perforated 7" OD casing in Delaware formation with two 0.50" diameter holes per foot at 7807-7811', 7816-7824' and 7853-7857'. (32 shots total) 8) Treated Delaware perfs. 7807-7857' with 750 gallons mud acid, 5000 gallons 15% NE acid, 9000 gallons gelled lease oil, 9000# 20-40 sand and 22 ball sealers. 9) Returned well to production status 5-28-74 pumping Delaware perfs. 7807-7857' for 63 bbls. oil, 6 bbls. water and 1 MCFGPD.

38. GEOLOGIC MARKERS

NAME	TOP MEAS. DEPTH	TOP TRUE VERT. DEPTH

U.S. GOVERNMENT PRINTING OFFICE: 1963—O-683636

8) Flowed 24-1/2 hours through 1" choke, making no oil, 45 bbls. load water, 393 bbls. formation water and gas at rate of 266 MCF per day. FTP 200#, CP 2300#.
9) Ran flow meter, Gradionometer and Temperature Survey to determine water entry.
10) Shut well in seven hours, then ran Base Temperature Log 16,000-17,020'. Water channelling from bottom of well bore to 16,508'.
11) Set cement retainer at 16,250' and squeezed perfs. 16,499-16,614' with 150 sacks Class "H" cement containing 4/10ths of 1% CFR-2 and 1% Halad 9. Squeeze failed. WOC 4 hours.
12) Resqueezed perfs. 16,449-16,614' with 50 sacks Class "H" cement with 1% Halad 9, 4/10ths of 1% CFR-2 and 1/4# Flocele per sack and 150 sacks Class "H" containing 1% Halad 9 and 4/10ths of 1% CFR-2. Squeeze failed.
13) Attempted to pull cement retainer - stuck.
14) Milled and pushed cement retainer from 16,250' to 16,490'. Recovered cement retainer.
15) Drilled and pushed junk to 16,930'.
16) Ran 254 jts. (14,793') of 2-7/8" OD tubing and set packer at 14,810'. Swabbed 9 hours, recovering 60 bbls. load water with good show of gas.
17) Treated perfs. 16,449-16,614' with 500 gals. 15% NE acid with 2 ball sealers. Swabbed 7 hours, recovering 1 bbl. load water, flowing gas at rate of 50 MCF per day.
18) Treated perfs. 16,449-16,614' with 5000 gals. 15% NE acid and 27 ball sealers.
19) Ran Temperature Survey 15,000-16,958'.
20) Tested well. Well flowed at rate of 910 MCF per day on 23/64" choke, no oil, FTP 310#. Pulled tubing and packer.
21) Reran 457 jts. (14,940') of 2-7/8" OD 7.9# DSS-HT Atlas-Bradford Condition "A" tubing and set at 14,967'.
22) Circulated hole with corrosion inhibitor water. Released rig 11-8-72. Flowed and tested well.
23) On Dec. 11, 1972, treated perfs 16,449-16,614' with 12,500 gals. of 1% KCL water with 62# friction reducer, 25 gals. Adofoam and 25 gals. scale inhibitor, 20,000 gals. 20% retarded acid with 100# friction reducer, 40 gals. Adofoam, 160 gals. acid inhibitor, 1000# fluid loss agent and 40 gals. scale inhibitor and 7 ball sealers. All fluid contained 400 S.C.F Nitrogen per barrel.
24) Testing well.

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE* (Other instructions re-verse side)

Form approved.
Budget Bureau No. 42-R1424.

5. LEASE DESIGNATION AND SERIAL NO.
NM-03429-A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME
---

7. UNIT AGREEMENT NAME
---

8. FARM OR LEASE NAME
West Jal Unit

9. WELL NO.
1

10. FIELD AND POOL, OR WILDCAT
Undesignated Fusselman

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec. 20-25S-36E

12. COUNTY OR PARISH
Lea

13. STATE
New Mexico

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—" for such proposals.)

1. OIL WELL ☐ GAS WELL ☒ OTHER

2. NAME OF OPERATOR
Skelly Oil Company

3. ADDRESS OF OPERATOR
P. O. Box 1351, 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' FNL and 660' FEL Sec. 20-25S-36E

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)
3076' GR

16. 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) Clean out & deepen to 17,086'			☒
(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.) *

1) Rigged up rotary tools 7-28-72. Pulled tubing and packer.
2) Set cement retainer at 11,390' and squeezed Strawn 7" OD casing perfs. 11,510-11,741' with 100 sacks Class "H" cement containing 1% CFR-2 and 3# sand per sack. Squeeze failed. WOC 4 hours.
3) Resqueezed perfs. 11,510-11,741' with 100 sacks Class "H" cement containing 5/10% of 1% CFR-2 and 3# sand per sack. Squeezed at 6500#. Reversed out 15 sacks.
4) After WOC 12 hours, drilled cement retainer at 11,390' and cement 11,390-11,755' with 6-1/2" bit.
5) Tested squeeze job to 3000#; held okay.
6) Drilled cement 11,790-11,832' and tested old squeeze job on perfs. 11,736-11,815' to 3000#; held okay.
7) Drilled cement 11,832-11,844'; pushed plus-plug to 11,976'. Drilled plug. Tagged junk at 12,002' and pushed to 12,312'.
8) Cleaned to top of 5-1/2" OD liner at 12,032', set cement retainer at 11,820' and found casing perfs. 11,849-11,894' open.
9) Squeezed 5-1/2" casing perfs. 11,849-11,894' with 50 sacks Class "H" with 1% CFR-2 and 100 sacks Class "H" with 1% CFR-2 and 3# sand per sack.
10) Dumped 20 sacks cement on retainer at 11,820', plugging back to 11,717'. Reversed out 90 sacks cement. WOC 12 hours.

(continued on page 2)

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

SIGNED _____ TITLE Lead Clerk DATE Dec. 18, 1972

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

ACCEPTED FOR RECORD
DEC 20 1972
U. S. GEOLOGICAL SURVEY
HOBBS, NEW MEXICO

*See Instructions on Reverse Side

11) Drilled cement 11,708-11,820'; cement retainer 11,820-11,822' and cement 11,822-11,861'. Cleaned out to top of liner at 12,032'.
12) Tested squeeze job to 2500#; held okay.
13) Drilled junk 12,312-12,748.5'; cement 12,748.5-12,760'; junk to 12,762'; cement 12,762-13,030'.
14) Tested old squeezed perfs. 13,005-13,030' to 2500#; held okay.
15) Milled and drilled cast iron bridge plug at 13,174' and pushed to 13,395'.
16) Tested 5-1/2" OD liner perfs. 13,247-13,360' to 2900#; could not pump into perfs.
17) Milled cast iron bridge plug 13,396-13,400'.
18) Tested perfs. 13,462-13,472' to 2700#; could not pump into perfs.
19) Milled and drilled out cement retainer 13,517-13,524'; cement 13,524-13,532'; cement 15,050-15,353'.
20) Milled and drilled cast iron bridge plug 15,340-15,858'. Washed over fish 15,858'; recovered fish. Cleaned out to old TD of 15,958'.
21) Drilled 4-3/4" new hole 15,958-16,498'.
22) Ran Drill Stem Test No. 1 (Silurian) 15,400-16,498'.
23) Drilled 4-3/4" hole 16,498' to total depth of 17,086' at 11 p.m. October 4, 1972.

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE* (Other instruction reverse side)

Form approved.
Budget Bureau No. 42-R1424.

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—" for such proposals.)

5. LEASE DESIGNATION AND SERIAL NO.: NM - 03429 - A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: - - -

1. OIL WELL ☐ GAS WELL ☒ OTHER

7. UNIT AGREEMENT NAME: - - -

2. NAME OF OPERATOR: Shelly Oil Company

8. FARM OR LEASE NAME: West Jal Unit

3. ADDRESS OF OPERATOR: P. O. Box 730 - Hobbs, New Mexico 88240

9. WELL NO.: 1

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 1980' FNL and 660' FEL Section 20-25S-36E

10. FIELD AND POOL, OR WILDCAT: Strawn Formation

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: 20-25S-36E

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.): 3102' DF

12. COUNTY OR PARISH: Lea

13. STATE: New Mexico

16. 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) Cement, perforate & treat			☒
(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.) *

1) Perforated 2-7/8"OD tubing at 11,696',11,297', 10,574; 9698'; 8892';8707',8403'. Circulated to remove mud from annulus. Work began 1-29-69.
2) Pulled tubing
3) Ran 2-7/8"OD tubing with "RTTS" Packer. Set packer at 11,[illegible]'.
4) Squeezed 7"OD casing perforations 11,736-11,894' with 150 sacks class "H" Cement with 1% CFR-2 per sack, maximum pressure 4600#, failed. W.O.C. 4 hours. Broke formation down with 5000#.
5) Squeezed 7"OD casing perforations 11,736-11,894" with 50 sacks Class "H" cement with 1% CFR-2 and 5# No. 3 sand per sack. Displaced 35 sacks into formation. Pulled tubing and packer.
6) WOC 36 hours. Ran tubing with 6-1/8" bit. Top of cement inside 7"OD casing at 11,595'. Washed and circulated cement to 11,620'. Drilled cement 11,620-11,700'. Drilled packer 11,700-705'. Drilled cement 11,705-755'.
7) Tested casing to 3000#, held okay.
8) Spotted 12 bbls. acid 11,755-11,443'.
9) Perforated 7"OD casing with 2 shots per foot as follows:

11,510 - 513'	3'	6 shots
11,517- 527'	10'	20 shots
11,536 - 540'	4'	8 shots
11,550 - 556'	6'	12 shots
11,561 - 567'	6'	12 shots
11,575 - 579'	4'	8 shots
11,660 - 667'	7'	14 shots

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

SIGNED _____ TITLE District Production Manager DATE 3-10-69

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

(ORIGINAL SIGNED) V. E. Fletcher
APPROVED
MAR 11 1969
J. L. GORDON
ACTING DISTRICT ENGINEER

*See Instructions on Reverse Side

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.
~~73503~~ NM-03429-A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

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—" for such proposals.)

1. OIL WELL ☐ GAS WELL ☒ OTHER

7. UNIT AGREEMENT NAME
---

2. NAME OF OPERATOR
Shelly Oil Company

8. FARM OR LEASE NAME
West Jal Unit

3. ADDRESS OF OPERATOR
P. O. Box 730 - Hobbs, New Mexico 88240

9. WELL NO.
1

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.)
At surface 1980 from North line and 660 from East line, Section 20

10. FIELD AND POOL, OR WILDCAT
Strawn Formation

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
20-25S-36E

20-25S-36E

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)
3092' DF

12. COUNTY OR PARISH
Lea

13. STATE
New Mexico

16. 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)			
(Other) Cement, Perforate & Treat			X				

(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.) *

Squeeze present perforated interval 11,736-11,852', below packer set at 11,700', with 125 sacks cement. Drill out to 11,790'. Perforate 11,510-11,783' with 2 shots per foot. Treat perforations 11,510-11,783' with 300 gallons 15% acid with 3 stage treatment using Dowell J-182 as diverting agent. Inject 72 barrels distillate to remove diverting agent. Swab and test.

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

SIGNED (signed) C. R. DAVIS TITLE District Operations Manager DATE 1/24/69

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____
CONDITIONS OF APPROVAL, IF ANY:

APPROVED

JAN 2[illegible]

J. L. GORDON
ACTING DISTRICT ENGINEER

RT/jc

*See Instructions on Reverse Side

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.

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—" for such proposals.)

1. OIL WELL ☐ GAS WELL ☒ OTHER

5. LEASE DESIGNATION AND SERIAL NO.: NM - 03429-A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: - -

7. UNIT AGREEMENT NAME: - -

2. NAME OF OPERATOR: Skelly Oil Company

8. FARM OR LEASE NAME: West Jal Unit

3. ADDRESS OF OPERATOR: P. O. Box 730 - Hobbs, New Mexico 88240

9. WELL NO.: 1

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 1980' from North line and 660' from East line

10. FIELD AND POOL, OR WILDCAT: Jal Strawn West

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: 20-25S-36E

14. PERMIT NO. - -

15. ELEVATIONS (Show whether DF, RT, GR, etc.): 3138'

12. COUNTY OR PARISH: Lea

13. STATE: New Mexico

16. 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) Eliminate water production			☒
(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.) *

(1) Moved in and rigged up workover rig 10-21-68
(2) Set Schlumberger "plus" plug in 7"OD casing at 11,844'.
(3) Dumped 5' cement on top of plug, filling from 11,844' to 11,839'.
(4) Dumped 200 lbs. Hydromite on top of "plus" plug, filling back to 11,832'.
(5) Swabbed well.
(6) Apparent communications still exist between upper and lower perforations behind 7"OD casing. Objective to shut off lower perforations 11,860 - 11,894' and to decrease water production unsuccessful.
(7) Well returned to producing status 10-27-68 flowing 150 MCF gas per day through 7" OD casing perforations 11,736 - 11,894'.

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

SIGNED [signature] TITLE District Production Manager DATE 10-30-68

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

APPROVED

NOV 1968

J. L. GORDON
ACTING DISTRICT ENGINEER

*See Instructions on Reverse Side

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.
NM - 03429 - A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME
-----

7. UNIT AGREEMENT NAME
-----

8. FARM OR LEASE NAME
West Jal Unit

9. WELL NO.
1

10. FIELD AND POOL, OR WILDCAT
Jal Strawn West

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec. 20-25S-36E

12. COUNTY OR PARISH
Lea

13. STATE
New Mexico

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—" for such proposals.)

1. OIL WELL ☐ GAS WELL ☒ OTHER

2. NAME OF OPERATOR
SKELLY OIL COMPANY

3. ADDRESS OF OPERATOR
P. O. Box 730 - Hobbs, New Mexico 88240

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

1980' FNL & 660' FEL Sec. 20-25S-36E

14. PERMIT NO.
-----

15. ELEVATIONS (Show whether DF, RT, GR, etc.)
3138' DF

16. 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) Clean, Determine Water Source, Eliminate Water Production			X
(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.) *

Moved in and rigged up Workover Rig. Killed well. Ran 1-5/8" drill pipe and fishing tools to top of fish at 9901', pushed to 9991', caught fish, circulated and pulled out of hole. Recovered 2 strings of fishing tools previously left in hole. Reran 1-5/8" drill pipe several times with fishing tools and recovered 1786' in several pieces of 5/16" wire line, and a chemical cutter.

Tagged bottom of 2-7/8"OD tubing at 11,715'. Knocked off one foot of tubing and a bull plug that had been previously cut off. Pushed and drove bull plug to 12,482'. Hit firm fill-up of formation cavings and left one-foot piece of 2-7/8"OD tubing and bull plug in hole at 12,482', leaving tubing open-ended at 11,715' with full 2-7/8" opening. Pulled drill pipe and fishing tools and installed Xmas tree. Ran Gradiomanometer, Continuous Flowmeter and Packer Flowmeter to determine water source. Surveys indicated water source being produced through casing perforations 11,883-11,894'.

Set packer at 11,883'. Returned to production status November 19, 1967, producing 38 bbls. oil, 800 bbls. water and 2,000 MCF gas per day from the Strawn Gas Pool through perforations 11736-11894' through 7"OD casing.

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

SIGNED (ORIGINAL SIGNED) V. E. Fletcher TITLE District Superintendent DATE April 25, 1968

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

APPROVED
APR 26 1968
J. L. GORDON
ACTING DISTRICT ENGINEER

*See Instructions on Reverse Side

Form 9-330
(Rev. 5-63)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN DUPLICATE* (See other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R355.5.

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

1a. TYPE OF WELL: OIL WELL ☐ GAS WELL ☒ DRY ☐ Other

b. TYPE OF COMPLETION: NEW WELL ☐ WORK OVER ☒ DEEP-EN ☒ PLUG BACK ☐ DIFF. RESVR. ☒ Other

2. NAME OF OPERATOR: Skelly Oil Company

3. ADDRESS OF OPERATOR: P. O. Box 1351, Midland, Texas 79701

4. LOCATION OF WELL (*Report location clearly and in accordance with any State requirements*)*
At surface: 1980' FNL and 660' FEL Sec. 20-25S-36E
At top prod. interval reported below
At total depth

5. LEASE DESIGNATION AND SERIAL NO.: NM-03429-A
6. IF INDIAN, ALLOTTEE OR TRIBE NAME: ---
7. UNIT AGREEMENT NAME: ---
8. FARM OR LEASE NAME: West Jal Unit
9. WELL NO.: 1
10. FIELD AND POOL, OR WILDCAT: Undesignated Fusselman
11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA: Sec. 20-25S-36E
12. COUNTY OR PARISH: Lea
13. STATE: New Mexico

14. PERMIT NO. / DATE ISSUED

15. DATE ~~SPUDDED~~ started: 7-28-72
16. DATE T.D. REACHED: 11-1-72
17. DATE COMPL. (*Ready to prod.*): 10-4-72
18. ELEVATIONS (DF, RKB, RT, GR, ETC.)*: 3076' GR
19. ELEV. CASINGHEAD: ---
20. TOTAL DEPTH, MD & TVD: 17,086'
21. PLUG, BACK T.D., MD & TVD: 17,020'
22. IF MULTIPLE COMPL., HOW MANY*: ---
23. INTERVALS DRILLED BY: → ROTARY TOOLS: 15,958-17,086' CABLE TOOLS: ---
24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)*: 16,449-16,614' (Fusselman)
25. WAS DIRECTIONAL SURVEY MADE: No
26. TYPE ELECTRIC AND OTHER LOGS RUN: BHC Sonic Gamma Ray with Caliper, Dual Laterolog, Continuous Dipmeter, Compensated Neutron & Formation Density
27. WAS WELL CORED: No

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

CASING SIZE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
20"	94#	869'	26"	1630 sacks	None
13-3/8"	72,61 & 68#	6300'	17-1/2"	3206 sacks	None
9-5/8"	53.5 & 47#	11,732'	12-1/4"	975 sacks	None

29. LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)
		(See attachment)		

30. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)
2-7/8"	14,967'	None

31. PERFORATION RECORD (*Interval, size and number*)
16,449-16,614' (Fourteen .33" holes over 165' interval)

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

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
11,510-11,741'	200 sacks Class "H" Cement
11,849-11,894'	150 sacks Class "H" Cement
16,449-16,614'	350 sacks Class "H" Cement
	(See attachment)

33.* PRODUCTION

DATE FIRST PRODUCTION	PRODUCTION METHOD (*Flowing, gas lift, pumping—size and type of pump*)	WELL STATUS (*Producing or shut-in*)
11-1-72	Flowing	Producing

DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD →	OIL—BBL.	GAS—MCF.	WATER—BBL.	GAS-OIL RATIO
11-14-72	24	24/64"		-0-	5950	216	----

FLOW. TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUR RATE →	OIL—BBL.	GAS—MCF.	WATER—BBL.	OIL GRAVITY-API (CORR.)
1900#	---		-0-	5950	216	---

34. DISPOSITION OF GAS (*Sold, used for fuel, vented, etc.*): Sold
TEST WITNESSED BY:

35. LIST OF ATTACHMENTS: 2 copies each: Borehole Compensated Sonic Log - Gamma Ray, Compensated Neutron-Formation Density, Dual Laterolog, Gammatron

36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records

SIGNED C.J. Love TITLE Dist. Prod. Manager DATE Dec. 20, 1972

*(See Instructions and Spaces for Additional Data on Reverse Side)

DEC 21 1972

Set Baker Cast Iron Bridge Plug at 13,400'. Spotted 2 sacks cement on top of bridge plug from 13,400' to 13,386'. Perforated 5-1/2" OD liner with 4 holes at 13,210' and squeezed with 85 sacks of cement. Drilled out cement to 13,386'. Perforated 5-1/2" liner with 4 shots per foot as follows: 13,247-13,270', 13,272-13,275', 13,286-13,292', 13,298-13,320', 13,326-13,329', 13,343-13,345', 13,356-13,360' for a total of 63' and 252 holes. Treated through 5-1/2" OD casing liner perfs. 13,247-13,360' (intervals) with 2500 gallons Mud Acid. Tested well several hours with volume to small to measure. Treated through 5-1/2" OD casing liner perfs. 13,247-13,360' (intervals) with 2500 gallons Mud Acid. Tested well several hrs. with volume to small to measure. Treated through 5-1/2" OD casing liner perfs. 13,247-13,360' (intervals) with 10,000 gallons 15% Regular Acid. Tested well several hours with volume to small to measure. Set Baker Cast Iron Model "N" Bridge Plug at 13,180'. Dumped 2 sacks of cement on top of plug, which plug well back from 13,180' to 13,166'. Perforated 5-1/2" OD liner with 4 holes per foot from 13,005' to 13,030' for a total of 25' and 100 holes. Treated through 5-1/2" OD liner perfs. 13,005-13,030' with 5,000 gallons 15% Regular Acid. Tested well several hours with volume too small to measure. We temporarily abandoned the testing of the Morrow Zone at this time. Set Halliburton "DC" Cement Retainer at 12,790' and squeezed 85 sacks of cement into 5-1/2" OD liner perfs. 13,005-13,030'. Plugged back total depth 12,790'. Perforated 7" OD casing with 4 holes per foot as follows: 11,736-11,741', 11,781-11,787', 11,808-11,815', 11,849-11,852', 11,860-11,894' for a total of 55' and 220 holes. Set Baker Model "F" Production Packer at 11,700'. Ran 2-7/8" OD 6.40# Buttress thread N-80 tubing to 11,715' and seated in Baker Model "F" Production Packer at 11,700' with perfs. 11,711-11,715'. Otis landing nipple position No. 1 at 11,709'. Otis side door shift valve at 11,698'. Otis landing nipple position No. 2 at 10,700'. Otis landing nipple position No. 3 at 9700'. Opened well up and flowed to pit to clean up. Shut well in for 89 hours. After 89 hours with dead weight T.P. 6218# flowed and tested well in the following manner:

Flowed 1-3/4 hours on 10/64" choke, opening TP 6218# (DW), FTP 6156psi., gas volume 2,737 MCFPD and 7.60 bbls. of 52 degree corrected gravity condensate.
Next two hours flowed through 12/64" choke, FTP 6075 psi. (DW), gas volume 4563 MCFPD and and 6.60 bbls. of condensate.
Next two hours flowed through 14/64" choke, FTP 5995 psi. (DW), gas volume 6025 MCFPD and 8.70 bbls. of condensate.
Next one and one half hours flowed through 16/64" choke, FTP 5915 psi. (DW), gas volume 8009 MCFPD and undetermined amount of condensate to pits.
Established 24 hour New Mexico Conservation Commission AOF Potential of 310,000 MCFPD.
Completed January 22, 1963, as a "Wildcat" completion in Strawn (Pennsylvanian) formation.
Total condensate recovery during 7-1/4 hrs. test was 22.80 bbls. to tank and undetermined amount to pits.

Well now shut in - Waiting on gas connection.

FORMATION RECORD

From	To	Feet	
0	12,058	12,058	
12,058	12,152	94	
12,152	12,477	325	Lime & Shale - Top Atoka 12,152'
12,477	13,366	889	Sand - Top Morrow 12,477'
13,366	14,583	1,217	Shale - Top Barnett Shale 13,366'
14,583	14,685	102	Lime - Top Mississippian 14,853'
14,685	15,138	453	Chert - Top Cherty 14,685'
15,138	15,518	380	Shale - Top Woodford 15,138
15,518	15,958	440	Lime & Dolmite - Top Devonian 15,518'
[illegible]	15,958		Total Depth
	12,790		Plugged Back Total Depth

Geological Tops by Schlumberger Gamma Ray Sonic Log

APPENDIX B

IDENTIFICATION OF OPERATORS, LESSEES, SURFACE OWNERS, AND OTHER INTERESTED PARTIES WITHIN ONE MILE OF THE PROPOSED INDEPENDENCE AGI #2; NOTIFICATION LETTERS, PROOF OF DELIVERY AND AFFIDAVIT OF PUBLICATION

Figure B-1:	Surface owners and operators within a one-mile radius of the proposed Independence AGI #2 surface- and bottom-hole location
Figure B-2:	Lessees and mineral ownership within a one-mile radius of the proposed Independence AGI #2 surface- and bottom-hole location
Table B-1:	Summary List of surface owners, lessees, and mineral rights owners within one mile of the proposed Independence AGI #2 surface- and bottom-hole location, whom were provided notification and a complete copy of the C-108 application
Attachment A:	Notification letters sent to interested parties and proof-of-delivery
Attachment B:	Public Newspaper Notice and Affidavit of Publication

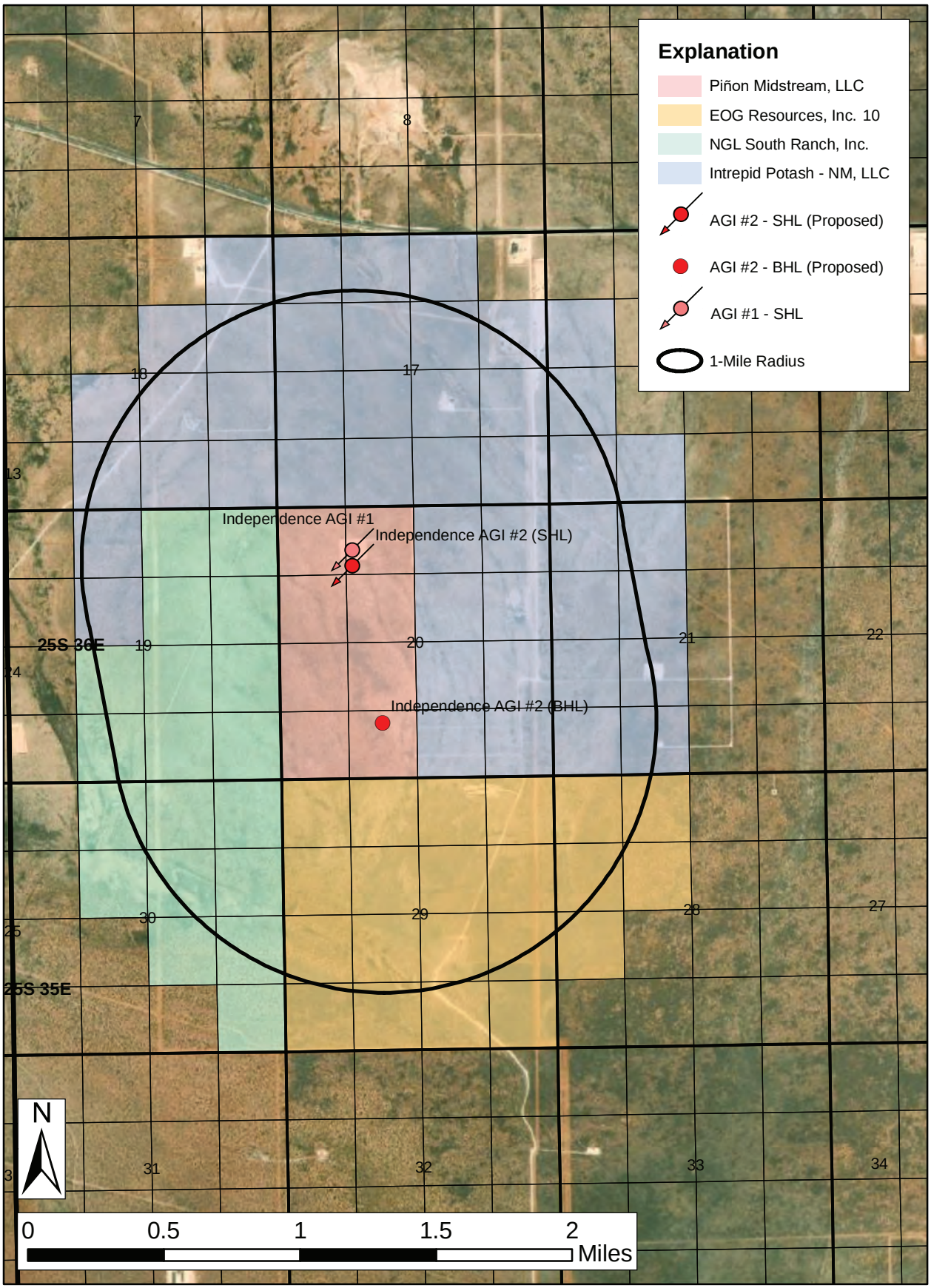


Figure B-1. Surface owners and active operators within one mile of proposed Independence AGI #2.

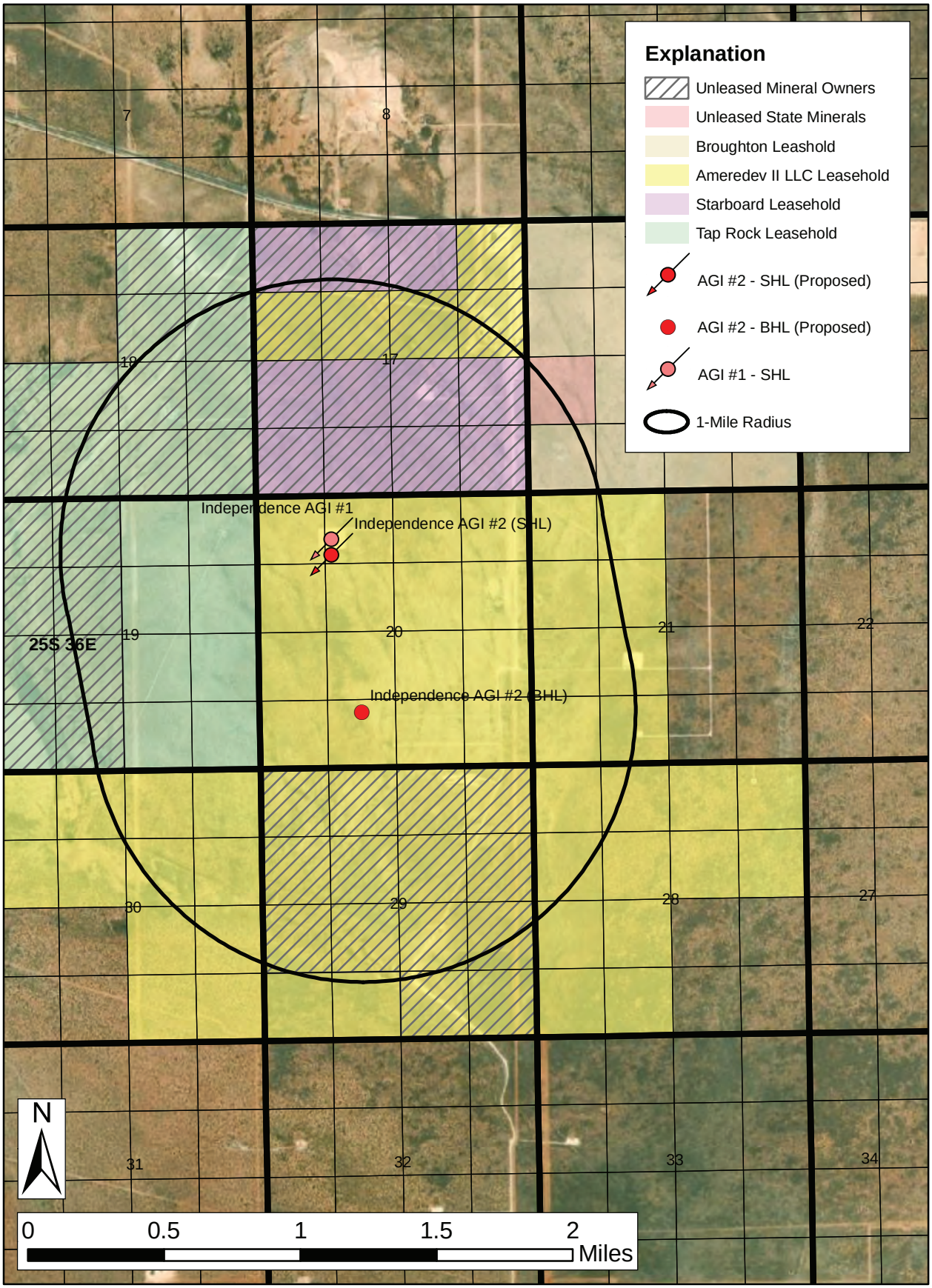


Figure B-2. Leaseholders and mineral ownership within one mile of the proposed AGI.
NOTE: State of NM and BLM hold mineral rights in all sections within one mile.

TABLE B-1. PARTIES TO BE INDIVIDUALLY NOTIFIED

Surface Owners:

EOG Resources, Inc.
5509 Champions Drive
Midland, TX 79706
(432)686-3600

Intrepid Potash – New Mexico, LLC
1996 Potash Mines Rd.
Carlsbad, NM 88221
(575)887-5591

NGL South Ranch, Inc.
3773 Cherry Creek North Dr., Suite 1000
Denver, CO 80209
(918)481-1119

Active Operators:

Ameredev II, LLC
2901 Via Fortuna, Suite 600
Austin, TX 78746

BC & D Operating, Inc.
1008 West Broadway
Hobbs, NM 88240
(575)393-2727

Tap Rock Operating, LLC
523 Park Point Drive, Suite 200
Golden, CO 80401

Lessees:

Ameredev II, LLC
2901 Via Fortuna, Suite 600
Austin, TX 78746

Broughton Petroleum, Inc.
1205 Silliman St.
Sealy, TX 77474

Starboard Permian
5528 Vickery Boulevard
Dallas, TX 75206

Tap Rock Resources II, LLC
523 Park Point Drive, Suite 200
Golden, CO 80401

Mineral Rights Owners:

Bureau of Land Management
301 Dinosaur Trail
Santa Fe, NM 87508
(505)954-2000

Allison Marks
New Mexico State Land Office
310 Old Santa Fe Trail
Santa Fe, NM 87504-1148

ATTACHMENT A

Copies of Signed Notification Letters
and Proof of Delivery

GEOLEX®
INCORPORATED

Alberto A. Gutiérrez, C.P.G.

November 1, 2021

Ameredev II, LLC
2901 Via Fortuna, Suite 600
Austin, TX 78746

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED

RE: PIÑON MIDSTREAM, LLC PROPOSED INDEPENDENCE AGI WELL NO. 2

To Whom It May Concern:

This letter is to advise you that Piñon Midstream, LLC (Piñon) intends to file the enclosed C-108 application (Application for Authorization to Inject) with the New Mexico Oil Conservation Division seeking administrative approval to drill and operate an acid gas injection (AGI) well, the Independence AGI No. 2 well, at their active Dark Horse Gas Treatment Facility in Lea County, New Mexico. The proposed Independence AGI No. 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 Dark Horse Facility.

The proposed redundant well (Independence AGI No. 2) will be a deviated well with a surface location of approximately 1,578 feet from the west line (FWL) and 1,180 feet from the north line (FNL) in Section 20, Township 25 South, Range 36 East, and a bottom-hole location of approximately 2,132 feet FWL and 1,033 feet from the south line (FSL) in Section 20, Township 25 South, Range 36 East, in Lea County, New Mexico. As proposed, the Independence AGI No. 2 well will inject waste carbon dioxide and hydrogen sulfide into the Devonian through Fusselman geologic formations through an open-hole completion between approximately 16,080 feet and a total vertical depth of approximately 17,683 feet. The maximum allowable surface pressure will not exceed 5,005 psig, and combined, the two-well AGI system will not exceed a daily injection volume of twenty (20) 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 (505)842-8000 at Geolex, Inc.®; 500 Marquette Avenue NW, Suite 1350; Albuquerque, New Mexico 87102.

Sincerely,
Geolex®, Inc.

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

Enclosure: Complete Application for Authority to Inject (Form C-108)

P:\21-026 Pinon AGI #2 eval-permitting\Notifications & Publications\Interested Party Notification Letters\Ameredev Notice.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

GEOLEX®
INCORPORATED

Alberto A. Gutiérrez, C.P.G.

November 1, 2021

BC & D Operating, Inc.
1008 West Broadway
Hobbs, NM 88240

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED

RE: PIÑON MIDSTREAM, LLC PROPOSED INDEPENDENCE AGI WELL NO. 2

To Whom It May Concern:

This letter is to advise you that Piñon Midstream, LLC (Piñon) intends to file the enclosed C-108 application (Application for Authorization to Inject) with the New Mexico Oil Conservation Division seeking administrative approval to drill and operate an acid gas injection (AGI) well, the Independence AGI No. 2 well, at their active Dark Horse Gas Treatment Facility in Lea County, New Mexico. The proposed Independence AGI No. 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 Dark Horse Facility.

The proposed redundant well (Independence AGI No. 2) will be a deviated well with a surface location of approximately 1,578 feet from the west line (FWL) and 1,180 feet from the north line (FNL) in Section 20, Township 25 South, Range 36 East, and a bottom-hole location of approximately 2,132 feet FWL and 1,033 feet from the south line (FSL) in Section 20, Township 25 South, Range 36 East, in Lea County, New Mexico. As proposed, the Independence AGI No. 2 well will inject waste carbon dioxide and hydrogen sulfide into the Devonian through Fusselman geologic formations through an open-hole completion between approximately 16,080 feet and a total vertical depth of approximately 17,683 feet. The maximum allowable surface pressure will not exceed 5,005 psig, and combined, the two-well AGI system will not exceed a daily injection volume of twenty (20) 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 (505)842-8000 at Geolex, Inc.®; 500 Marquette Avenue NW, Suite 1350; Albuquerque, New Mexico 87102.

Sincerely,
Geolex®, Inc.

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

Enclosure: Complete Application for Authority to Inject (Form C-108)

P:\21-026 Pinon AGI #2 eval-permitting\Notifications & Publications\Interested Party Notification Letters\BC_D Notice.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

GEOLEX®
INCORPORATED

Alberto A. Gutiérrez, C.P.G.

November 1, 2021

Bureau of Land Management
301 Dinosaur Trail
Santa Fe, NM 87508

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED

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

Enclosure: Complete Application for Authority to Inject (Form C-108)

P:\21-026 Pinon AGI #2 eval-permitting\Notifications & Publications\Interested Party Notification Letters\BLM Notice.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

GEOLEX®
INCORPORATED

Alberto A. Gutiérrez, C.P.G.

November 1, 2021

Broughton Petroleum, Inc.
1205 Silliman Street
Sealy, TX 77474

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED

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President & Consultant to Piñon Midstream

Enclosure: Complete Application for Authority to Inject (Form C-108)

P:\21-026 Pinon AGI #2 eval-permitting\Notifications & Publications\Interested Party Notification Letters\Broughton Notice.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

GEOLEX®
INCORPORATED

Alberto A. Gutiérrez, C.P.G.

November 1, 2021

EOG Resources, Inc.
5509 Champions Drive
Midland, TX 79706

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED

RE: PIÑON MIDSTREAM, LLC PROPOSED INDEPENDENCE AGI WELL NO. 2

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President & Consultant to Piñon Midstream

Enclosure: Complete Application for Authority to Inject (Form C-108)

P:\21-026 Pinon AGI #2 eval-permitting\Notifications & Publications\Interested Party Notification Letters\EOG Notice.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

GEOLEX®
INCORPORATED

Alberto A. Gutiérrez, C.P.G.

November 1, 2021

Intrepid Potash
1001 17th St., Suite 1050
Denver, CO 80202

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED

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

Enclosure: Complete Application for Authority to Inject (Form C-108)

P:\21-026 Pinon AGI #2 eval-permitting\Notifications & Publications\Interested Party Notification Letters\Intrepid Notice.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

GEOLEX®
INCORPORATED

Alberto A. Gutiérrez, C.P.G.

November 1, 2021

NGL South Ranch, Inc.
3773 Cherry Creek N Drive, Suite 1000
Denver, CO 80209

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED

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President & Consultant to Piñon Midstream

Enclosure: Complete Application for Authority to Inject (Form C-108)

P:\21-026 Pinon AGI #2 eval-permitting\Notifications & Publications\Interested Party Notification Letters\NGL Notice.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

GEOLEX®
INCORPORATED

Alberto A. Gutiérrez, C.P.G.

November 1, 2021

Allison Marks
New Mexico State Land Office
310 Old Santa Fe Trail
Santa Fe, NM 87504-1148

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED

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Enclosure: Complete Application for Authority to Inject (Form C-108)

P:\21-026 Pinon AGI #2 eval-permitting\Notifications & Publications\Interested Party Notification Letters\SLO Notice.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

GEOLEX®
INCORPORATED

Alberto A. Gutiérrez, C.P.G.

November 1, 2021

Starboard Permian
5528 Vickery Boulevard
Dallas, TX 75206

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED

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President & Consultant to Piñon Midstream

Enclosure: Complete Application for Authority to Inject (Form C-108)

P:\21-026 Pinon AGI #2 eval-permitting\Notifications & Publications\Interested Party Notification Letters\Starboard Notice.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

GEOLEX®
INCORPORATED

Alberto A. Gutiérrez, C.P.G.

November 1, 2021

Tap Rock Operating, LLC
523 Park Point Dr., Suite 200
Golden, CO 80401

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED

RE: PIÑON MIDSTREAM, LLC PROPOSED INDEPENDENCE AGI WELL NO. 2

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President & Consultant to Piñon Midstream

Enclosure: Complete Application for Authority to Inject (Form C-108)

P:\21-026 Pinon AGI #2 eval-permitting\Notifications & Publications\Interested Party Notification Letters\Tap Rock Notice.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

TRACK ANOTHER SHIPMENT

775086504046

ADD NICKNAME

Delivered

DELIVERED

Signed for by: G.GRADY

GET STATUS UPDATES

OBTAIN PROOF OF DELIVERY

FROM

Liz Hill

500 MARQUETTE AVE. NW #1350
ALBUQUERQUE, NM US 87102
505-842-8000

TO

Ameredev II, LLC

2901 Via Fortuna
Ste 600
AUSTIN, TX US 78746
505-842-8000

MANAGE DELIVERY

Travel History

TIME ZONE
Local Scan Time

Tuesday, November 2, 2021

9:36 AM	AUSTIN, TX	Delivered
8:19 AM	AUSTIN, TX	On FedEx vehicle for delivery
7:24 AM	AUSTIN, TX	At local FedEx facility
5:37 AM	AUSTIN, TX	At destination sort facility
4:15 AM	MEMPHIS, TN	Departed FedEx hub

Monday, November 1, 2021

11:02 PM	MEMPHIS, TN	Arrived at FedEx hub
7:01 PM	ALBUQUERQUE, NM	Left FedEx origin facility
5:36 PM	ALBUQUERQUE, NM	Picked up
3:58 PM		Shipment information sent to FedEx

Expand History

Shipment Facts

TRACKING NUMBER
775086504046

SERVICE
FedEx Standard Overnight

WEIGHT
1 lbs / 0.45 kgs

DELIVERY ATTEMPTS
1

DELIVERED TO
Receptionist/Front Desk

TOTAL PIECES
1

TOTAL SHIPMENT WEIGHT
1 lbs / 0.45 kgs

TERMS
Shipper

PACKAGING
FedEx Envelope

SPECIAL HANDLING SECTION
Deliver Weekday

SHIP DATE
11/1/21

STANDARD TRANSIT
11/2/21 before 4:30 pm

ACTUAL DELIVERY
11/2/21 at 9:36 am

TRACK ANOTHER SHIPMENT

775086576940

ADD NICKNAME

ON TIME

Shipment is available for pickup at FedEx Facility: 210 WEST NAVAJO. We'll hold the shipment for five business days starting from November 04, 2021.

Scheduled delivery:
Pending pickup

READY FOR PICKUP
HOBBS, NM

GET STATUS UPDATES

FROM
Liz Hill
500 MARQUETTE AVE. NW #1350
ALBUQUERQUE, NM US 87102
505-842-8000

TO
BC & D Operating, Inc.
FedEx Facility
210 WEST NAVAJO
HOBBS, NM US 88240
575-393-2727

MANAGE DELIVERY

Travel History

TIME ZONE
Local Scan Time

Thursday, November 4, 2021		
7:41 AM	HOBBS, NM	Ready for recipient pickup Package available for pickup at FedEx Facility: 210 WEST NAVAJO
7:33 AM	HOBBS, NM	At local FedEx facility
Wednesday, November 3, 2021		
10:37 AM	HOBBS, NM	Delay Business closed- No delivery attempt

6:27 AM	HOBBS, NM	At local FedEx facility
Tuesday, November 2, 2021		
5:40 PM	HOBBS, NM	At local FedEx facility
3:09 PM		Delivery option requested Hold at FedEx Facility request received - Check back later for shipment status
10:41 AM	HOBBS, NM	Delay Customer not available or business closed.
9:43 AM	HOBBS, NM	At local FedEx facility
9:05 AM	HOBBS, NM	At local FedEx facility
6:28 AM	LUBBOCK, TX	At destination sort facility
4:33 AM	MEMPHIS, TN	Departed FedEx hub
Monday, November 1, 2021		
11:02 PM	MEMPHIS, TN	Arrived at FedEx hub
7:01 PM	ALBUQUERQUE, NM	Left FedEx origin facility
5:36 PM	ALBUQUERQUE, NM	Picked up
4:02 PM		Shipment information sent to FedEx

Expand History

Shipment Facts

TRACKING NUMBER
775086576940

SERVICE
FedEx Standard Overnight

WEIGHT
1 lbs / 0.45 kgs

TOTAL PIECES
1

TOTAL SHIPMENT WEIGHT
1 lbs / 0.45 kgs

TERMS
Shipper

PACKAGING
FedEx Envelope

SPECIAL HANDLING SECTION
Deliver Weekday

CUSTOMER EXCEPTION REQUEST NUMBER (CER)
1102C-41858924

SHIP DATE
11/1/21

SHIPMENT-FACTS.RECIPIENT-ADDRESS
1008 West Broadway, HOBBS, 88240, NM, US

SCHEDULED DELIVERY
Pending pickup

dwhite@geolex.com

From: Santiago Flores <SFlores@Geolex.com>
Sent: Thursday, November 4, 2021 10:43 AM
To: dhill@wellconsultant.com
Cc: David White
Subject: Independence AGI #2 Permit Application and Notice
Attachments: C-108 Independence AGI #2 Permit Application 11-1 (Reduced).pdf; Notificaiton of Independence AGI #2 Permit Application.pdf

Good morning, Mr. Hill.

As an active operator within 1 mile of the proposed well (Independence AGI #2), BC&D is being notified of Piñon Midstream's intent to permit a redundant AGI well as part of the Dark Horse Gas Treatment Facility. The permit application and signed notification letter for the Independence AGI #2 are attached. Per our discussion today (Nov. 4th), digital copies of the signed notification letter and permit application are being sent to you as our records indicate that the hard copies, sent via FedEx on November 1st to 1008 West Broadway, Hobbs, NM 88240, have yet to be delivered. Please review the attachments and forward them to the appropriate personnel within your organization as you see fit.

Thank you for the additional information you provided me today, and if you have any questions, feel free to reach out any time.

Santiago Flores, M.S.
Geolex, Incorporated®
500 Marquette Ave. NW Suite 1350
Albuquerque, NM 87102
(505) 842-8000 Office
(505) 220-4613 Cell

dwhite@geolex.com

From: Donnie Hill <dhill@wellconsultant.com>
Sent: Thursday, November 4, 2021 11:17 AM
To: Santiago Flores
Cc: David White
Subject: RE: Independence AGI #2 Permit Application and Notice

Good morning,

Thanks for submitting this to us. We will **not** protest this application.

Thanks,

DONNIE HILL
BC & D OPERATING, INC.
P.O. Box 302, Hobbs, NM 88241
575.390.7626 (Cell)
575.942.2005 (Fax)
dhill@wellconsultant.com

From: Santiago Flores [mailto:SFlores@Geolex.com]
Sent: Thursday, November 04, 2021 10:43 AM
To: Donnie Hill
Cc: David White
Subject: Independence AGI #2 Permit Application and Notice

Good morning, Mr. Hill.

As an active operator within 1 mile of the proposed well (Independence AGI #2), BC&D is being notified of Piñon Midstream's intent to permit a redundant AGI well as part of the Dark Horse Gas Treatment Facility. The permit application and signed notification letter for the Independence AGI #2 are attached. Per our discussion today (Nov. 4th), digital copies of the signed notification letter and permit application are being sent to you as our records indicate that the hard copies, sent via FedEx on November 1st to 1008 West Broadway, Hobbs, NM 88240, have yet to be delivered. Please review the attachments and forward them to the appropriate personnel within your organization as you see fit.

Thank you for the additional information you provided me today, and if you have any questions, feel free to reach out any time.

Santiago Flores, M.S.
Geolex, Incorporated®
500 Marquette Ave. NW Suite 1350

Albuquerque, NM 87102
(505) 842-8000 Office
(505) 220-4613 Cell

TRACK ANOTHER SHIPMENT

775086927298

ADD NICKNAME

Delivered

DELIVERED

Signed for by: R.DURAN

GET STATUS UPDATES

OBTAIN PROOF OF DELIVERY

FROM

Liz Hill

500 MARQUETTE AVE. NW #1350
ALBUQUERQUE, NM US 87102
505-842-8000

TO

Bureau of Land Management

301 Dinosaur Trail
SANTA FE, NM US 87508
505-954-2000

MANAGE DELIVERY

Travel History

TIME ZONE
Local Scan Time

Tuesday, November 2, 2021

10:50 AM	SANTA FE, NM	Delivered
9:27 AM	SANTA FE, NM	On FedEx vehicle for delivery
8:21 AM	SANTA FE, NM	At local FedEx facility

Monday, November 1, 2021

8:18 PM	ALBUQUERQUE, NM	At local FedEx facility
7:24 PM	ALBUQUERQUE, NM	At destination sort facility

7:00 PM	ALBUQUERQUE, NM	Left FedEx origin facility
5:36 PM	ALBUQUERQUE, NM	Picked up
4:26 PM		Shipment information sent to FedEx

Expand History

Shipment Facts

TRACKING NUMBER
775086927298

SERVICE
FedEx Standard Overnight

WEIGHT
0.5 lbs / 0.23 kgs

DELIVERY ATTEMPTS
1

DELIVERED TO
Shipping/Receiving

TOTAL PIECES
1

TOTAL SHIPMENT WEIGHT
0.5 lbs / 0.23 kgs

TERMS
Shipper

SHIPPER REFERENCE
21-026

PACKAGING
FedEx Envelope

SPECIAL HANDLING SECTION
Deliver Weekday

SHIP DATE
11/1/21

STANDARD TRANSIT
11/2/21 before 4:30 pm

ACTUAL DELIVERY
11/2/21 at 10:50 am

TRACK ANOTHER SHIPMENT

775086697491

ADD NICKNAME

Delivered

DELIVERED

Signature not required

GET STATUS UPDATES

OBTAIN PROOF OF DELIVERY

FROM

Liz Hill

500 MARQUETTE AVE. NW #1350
ALBUQUERQUE, NM US 87102
505-842-8000

TO

Broughton Petroleum, Inc.

1205 Silliman St.
SEALY, TX US 77474
505-842-8000

MANAGE DELIVERY

Travel History

TIME ZONE
Local Scan Time

Tuesday, November 2, 2021

12:00 PM	SEALY, TX	Delivered Package delivered to recipient address - release authorized
9:42 AM	HOUSTON, TX	On FedEx vehicle for delivery
8:55 AM	HOUSTON, TX	At local FedEx facility
5:56 AM	HOUSTON, TX	At destination sort facility
4:41 AM	MEMPHIS, TN	Departed FedEx hub

Monday, November 1, 2021

11:02 PM	MEMPHIS, TN	Arrived at FedEx hub
7:01 PM	ALBUQUERQUE, NM	Left FedEx origin facility

5:36 PM	ALBUQUERQUE, NM	Picked up
4:10 PM		Shipment information sent to FedEx

Expand History

Shipment Facts

TRACKING NUMBER
775086697491

SERVICE
FedEx Standard Overnight

WEIGHT
1 lbs / 0.45 kgs

DELIVERY ATTEMPTS
1

DELIVERED TO
Residence

TOTAL PIECES
1

TOTAL SHIPMENT WEIGHT
1 lbs / 0.45 kgs

TERMS
Shipper

PACKAGING
FedEx Envelope

SPECIAL HANDLING SECTION
Deliver Weekday

SHIP DATE
11/1/21

STANDARD TRANSIT
11/2/21 before 4:30 pm

ACTUAL DELIVERY
11/2/21 at 12:00 pm

TRACK ANOTHER SHIPMENT

775086302574

ADD NICKNAME

Delivered

DELIVERED

Signed for by: E.EOG

GET STATUS UPDATES

OBTAIN PROOF OF DELIVERY

FROM

Liz Hill

500 MARQUETTE AVE. NW #1350
ALBUQUERQUE, NM US 87102
505-842-8000

TO

EOG Resources

5509 Champions Drive
MIDLAND, TX US 79706
432-686-3600

MANAGE DELIVERY

Travel History

TIME ZONE
Local Scan Time

Tuesday, November 2, 2021

3:41 PM	MIDLAND, TX	Delivered
10:03 AM	MIDLAND, TX	On FedEx vehicle for delivery
9:26 AM	MIDLAND, TX	At local FedEx facility
6:28 AM	LUBBOCK, TX	At destination sort facility
4:33 AM	MEMPHIS, TN	Departed FedEx hub

Monday, November 1, 2021

11:02 PM	MEMPHIS, TN	Arrived at FedEx hub
7:01 PM	ALBUQUERQUE, NM	Left FedEx origin facility
5:36 PM	ALBUQUERQUE, NM	Picked up
3:44 PM		Shipment information sent to FedEx

Expand History

Shipment Facts

TRACKING NUMBER
775086302574

SERVICE
FedEx Standard Overnight

WEIGHT
1 lbs / 0.45 kgs

DELIVERY ATTEMPTS
1

DELIVERED TO
Receptionist/Front Desk

TOTAL PIECES
1

TOTAL SHIPMENT WEIGHT
1 lbs / 0.45 kgs

TERMS
Shipper

SHIPPER REFERENCE
21-026

PACKAGING
FedEx Envelope

SPECIAL HANDLING SECTION
Deliver Weekday

SHIP DATE
11/1/21

STANDARD TRANSIT
11/2/21 before 4:30 pm

ACTUAL DELIVERY
11/2/21 at 3:41 pm

TRACK ANOTHER SHIPMENT

775087251680

ADD NICKNAME

Delivered

DELIVERED

Signature release on file

GET STATUS UPDATES

OBTAIN PROOF OF DELIVERY

FROM

Liz Hill

500 MARQUETTE AVE. NW #1350
ALBUQUERQUE, NM US 87102
505-842-8000

TO

Intrepid Potash - NM LLC

1001 17th St.
Ste 1050
DENVER, CO US 80202
575-887-5591

MANAGE DELIVERY

Travel History

TIME ZONE
Local Scan Time

Tuesday, November 2, 2021

10:20 AM	DENVER, CO	Delivered Package delivered to recipient address - release authorized
9:22 AM	DENVER, CO	On FedEx vehicle for delivery
7:21 AM	DENVER, CO	At local FedEx facility
5:12 AM	DENVER, CO	At destination sort facility
4:01 AM	MEMPHIS, TN	Departed FedEx hub

Monday, November 1, 2021

11:02 PM	MEMPHIS, TN	Arrived at FedEx hub

7:01 PM	ALBUQUERQUE, NM	Left FedEx origin facility
5:36 PM	ALBUQUERQUE, NM	Picked up
4:52 PM		Shipment information sent to FedEx

Expand History

Shipment Facts

TRACKING NUMBER
775087251680

SERVICE
FedEx Standard Overnight

WEIGHT
0.5 lbs / 0.23 kgs

DELIVERY ATTEMPTS
1

TOTAL PIECES
1

TOTAL SHIPMENT WEIGHT
0.5 lbs / 0.23 kgs

TERMS
Shipper

SHIPPER REFERENCE
21-026

PACKAGING
FedEx Envelope

SPECIAL HANDLING SECTION
Deliver Weekday

SHIP DATE
11/1/21

STANDARD TRANSIT
11/2/21 before 4:30 pm

ACTUAL DELIVERY
11/2/21 at 10:20 am

dwhite@geolex.com

From: Santiago Flores <SFlores@Geolex.com>
Sent: Tuesday, November 2, 2021 9:14 AM
To: 'Ralph Ramstetter'
Cc: David White
Subject: Independence AGI #1 Permit Application and Notice
Attachments: C-108 Independence AGI #2 Permit Application 11-1.pdf; Notification of Independence AGI #2 Permit Applicaiton - Intrepid.pdf

Good morning, Mr. Ramstetter.

As a surface owner within 1 mile of the proposed well (Independence AGI #2), Intrepid Potash is being notified of Piñon Midstream's intent to permit a redundant AGI well as part of the the Dark Horse Gas Treatment Facility. The permit application and signed notification letter for the Independence AGI #2 are attached. Per our discussion yesterday (Nov. 1st), the hard copies were sent to the Intrepid corporate headquarters located at 1001 17th St., Suite 1050, Denver, Colorado 80202, as FedEx was unable to recognize either of the New Mexico addresses which were provided to us (1996 Potash Mines Rd., Carlsbad, NM 88220 *or* 210 Red Cloud Rd., Carlsbad, NM 88220), however, we are sending the permit application to you via e-mail to ensure that personnel located closest to area of interest are notified. Please distribute the permit application and notification letter to the appropriate personnel within your organization.

Thank you for your time and the additional information you were able to provide us. If you have any questions, feel free to reach out at any time.

Santiago Flores, M.S.
Geolex, Incorporated®
500 Marquette Ave. NW Suite 1350
Albuquerque, NM 87102
(505) 842-8000 Office
(505) 220-4613 Cell

TRACK ANOTHER SHIPMENT

775086415279

ADD NICKNAME

Delivered

DELIVERED

Signed for by: P.LIZA

GET STATUS UPDATES

OBTAIN PROOF OF DELIVERY

FROM

Liz Hill

500 MARQUETTE AVE. NW #1350
ALBUQUERQUE, NM US 87102
505-842-8000

TO

NGL South Ranch, Inc.

3773 Cherry Creek North Dr.,
Ste 1000
DENVER, CO US 80209
918-481-1119

MANAGE DELIVERY

Travel History

TIME ZONE
Local Scan Time

Tuesday, November 2, 2021

3:51 PM	DENVER, CO	Delivered
2:08 PM	DENVER, CO	On FedEx vehicle for delivery
1:53 PM	DENVER, CO	At local FedEx facility
9:28 AM	LITTLETON, CO	Operational Delay Incorrect address - Recipient moved
7:50 AM	LITTLETON, CO	At local FedEx facility

5:12 AM	DENVER, CO	At destination sort facility
4:01 AM	MEMPHIS, TN	Departed FedEx hub
Monday, November 1, 2021		
11:02 PM	MEMPHIS, TN	Arrived at FedEx hub
7:01 PM	ALBUQUERQUE, NM	Left FedEx origin facility
5:36 PM	ALBUQUERQUE, NM	Picked up
3:53 PM		Shipment information sent to FedEx

Expand History

Shipment Facts

TRACKING NUMBER
775086415279

SERVICE
FedEx Standard Overnight

WEIGHT
0.5 lbs / 0.23 kgs

DELIVERY ATTEMPTS
1

DELIVERED TO
Receptionist/Front Desk

TOTAL PIECES
1

TOTAL SHIPMENT WEIGHT
0.5 lbs / 0.23 kgs

TERMS
Shipper

SHIPPER REFERENCE
21-026

PACKAGING
FedEx Envelope

SPECIAL HANDLING SECTION
Deliver Weekday

SHIP DATE
11/1/21

STANDARD TRANSIT
11/2/21 before 4:30 pm

ACTUAL DELIVERY
11/2/21 at 3:51 pm

TRACK ANOTHER SHIPMENT

775086978450

ADD NICKNAME

Delivered

DELIVERED

Signed for by: A.SANCHEZ

GET STATUS UPDATES

OBTAIN PROOF OF DELIVERY

FROM

Liz Hill

500 MARQUETTE AVE. NW #1350
ALBUQUERQUE, NM US 87102
505-842-8000

TO

Allison Marks
New Mexico State Land Office

310 Old Santa Fe Trail
SANTA FE, NM US 87504
505-842-8000

MANAGE DELIVERY

Travel History

TIME ZONE
Local Scan Time

Tuesday, November 2, 2021

9:47 AM	SANTA FE, NM	Delivered
9:05 AM	SANTA FE, NM	On FedEx vehicle for delivery
8:21 AM	SANTA FE, NM	At local FedEx facility

Monday, November 1, 2021

8:18 PM	ALBUQUERQUE, NM	At local FedEx facility

7:24 PM	ALBUQUERQUE, NM	At destination sort facility
7:00 PM	ALBUQUERQUE, NM	Left FedEx origin facility
5:36 PM	ALBUQUERQUE, NM	Picked up
4:30 PM		Shipment information sent to FedEx

Expand History

Shipment Facts

TRACKING NUMBER
775086978450

SERVICE
FedEx Standard Overnight

WEIGHT
0.5 lbs / 0.23 kgs

DELIVERY ATTEMPTS
1

DELIVERED TO
Shipping/Receiving

TOTAL PIECES
1

TOTAL SHIPMENT WEIGHT
0.5 lbs / 0.23 kgs

TERMS
Shipper

SHIPPER REFERENCE
21-026

PACKAGING
FedEx Envelope

SPECIAL HANDLING SECTION
Deliver Weekday

SHIP DATE
11/1/21

STANDARD TRANSIT
11/2/21 before 4:30 pm

ACTUAL DELIVERY
11/2/21 at 9:47 am

TRACK ANOTHER SHIPMENT

775086732810

ADD NICKNAME

Delivered

DELIVERED

Signature not required

GET STATUS UPDATES

OBTAIN PROOF OF DELIVERY

FROM

Liz Hill

500 MARQUETTE AVE. NW #1350
ALBUQUERQUE, NM US 87102
505-842-8000

TO

Starboard Permian

5528 Vickery Boulevard
DALLAS, TX US 75206
505-842-8000

MANAGE DELIVERY

Travel History

TIME ZONE
Local Scan Time

Tuesday, November 2, 2021

2:03 PM	DALLAS, TX	Delivered Package delivered to recipient address - release authorized
8:52 AM	GARLAND, TX	On FedEx vehicle for delivery
8:08 AM	GARLAND, TX	At local FedEx facility
4:44 AM	DALLAS, TX	At destination sort facility
3:33 AM	MEMPHIS, TN	Departed FedEx hub

Monday, November 1, 2021

11:02 PM	MEMPHIS, TN	Arrived at FedEx hub
7:01 PM	ALBUQUERQUE, NM	Left FedEx origin facility

5:36 PM	ALBUQUERQUE, NM	Picked up
4:12 PM		Shipment information sent to FedEx

Expand History

Shipment Facts

TRACKING NUMBER
775086732810

SERVICE
FedEx Standard Overnight

WEIGHT
1 lbs / 0.45 kgs

DELIVERY ATTEMPTS
1

DELIVERED TO
Residence

TOTAL PIECES
1

TOTAL SHIPMENT WEIGHT
1 lbs / 0.45 kgs

TERMS
Shipper

PACKAGING
FedEx Envelope

SPECIAL HANDLING SECTION
Deliver Weekday, Residential Delivery

SHIP DATE
11/1/21

STANDARD TRANSIT
11/2/21 before 8:00 pm

ACTUAL DELIVERY
11/2/21 at 2:03 pm

TRACK ANOTHER SHIPMENT

775086650736

ADD NICKNAME

Delivered

DELIVERED

Signed for by: E.KASA

GET STATUS UPDATES

OBTAIN PROOF OF DELIVERY

FROM

Liz Hill

500 MARQUETTE AVE. NW #1350
ALBUQUERQUE, NM US 87102
505-842-8000

TO

Tap rock Operating, LLC

523 Park Point Drive
Suite 200
GOLDEN, CO US 80401
505-842-8000

MANAGE DELIVERY

Travel History

TIME ZONE
Local Scan Time

Tuesday, November 2, 2021

10:24 AM	GOLDEN, CO	Delivered
9:20 AM	DENVER, CO	On FedEx vehicle for delivery
7:42 AM	DENVER, CO	At local FedEx facility
5:12 AM	DENVER, CO	At destination sort facility
4:01 AM	MEMPHIS, TN	Departed FedEx hub

Monday, November 1, 2021

11:02 PM	MEMPHIS, TN	Arrived at FedEx hub
7:01 PM	ALBUQUERQUE, NM	Left FedEx origin facility
5:36 PM	ALBUQUERQUE, NM	Picked up
4:07 PM		Shipment information sent to FedEx

Expand History

Shipment Facts

TRACKING NUMBER
775086650736

SERVICE
FedEx Standard Overnight

WEIGHT
1 lbs / 0.45 kgs

DELIVERY ATTEMPTS
1

DELIVERED TO
Receptionist/Front Desk

TOTAL PIECES
1

TOTAL SHIPMENT WEIGHT
1 lbs / 0.45 kgs

TERMS
Shipper

PACKAGING
FedEx Envelope

SPECIAL HANDLING SECTION
Deliver Weekday

SHIP DATE
11/1/21

STANDARD TRANSIT
11/2/21 before 4:30 pm

ACTUAL DELIVERY
11/2/21 at 10:24 am

ATTACHMENT B

Copy of Public Notice published in Hobbs News Sun on October 26, 2021 and Affidavit of Publication

Affidavit of Publication

STATE OF NEW MEXICO
COUNTY OF LEA

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

Beginning with the issue dated
October 26, 2021
and ending with the issue dated
October 26, 2021.

Publisher

Sworn and subscribed to before me this
26th day of October 2021.

Circulation Clerk

My commission expires
October 29, 2022
(Seal)

OFFICIAL SEAL
Amity E. Hipp
NOTARY PUBLIC - STATE OF NEW MEXICO
My Commission Expires: 10/29/22

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

LEGAL LEGAL

LEGAL NOTICE
October 26, 2021

Piñon Midstream, LLC; 465 W NM Highway 128; Jal, New Mexico 88252, is filing Form C-108 (Application for Authorization to Inject) with the New Mexico Oil Conservation Division for administrative approval for its acid gas injection (AGI) well Independence AGI #2. The proposed well will be a deviated well with a surface location of approximately 1,578 feet FWL & 1,180 feet FNL in Section 20, Township 25 South, Range 36 East, and a bottom-hole location of approximately 2,132 feet FWL and 1,033 feet FSL in Section 20, Township 25 South, Range 36 East, in Lea County, New Mexico. The well will dispose of waste carbon dioxide and hydrogen sulfide sourced from area production of sour natural gas, which will be injected into the Devonian through Fusselman geologic formations through an open-hole completion between approximately 16,080 feet and a total vertical depth of approximately 17,683 feet. The maximum allowable surface pressure will not exceed 5,005 psig. The Independence AGI #2 well is intended to provide a redundant well option for existing acid gas injection operations, via Independence AGI #1, and increase total treatment capacity for the Piñon Midstream Dark Horse Treatment Facility. The maximum injection rate for the AGI two-well system will not exceed 20 million standard cubic feet per day (MMSCFD). Interested parties opposing the action must file objections or requests for hearing with the Oil Conservation Division; 1220 South St. Francis Drive; Santa Fe, New Mexico 87505 within 15 days. 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.
#36973

67101169 00259856

ALBERTO A. GUTIERREZ
GEOLEX, INC.
500 MARQUETTE AVE. NW, SUITE 1350
ALBUQUERQUE, NM 87102

APPENDIX C

PRELIMINARY DRILLING-FLUIDS PROGRAM GENERATED BY VALENCE DRILLING FLUIDS, LLC FOR THE PROPOSED INDEPENDENCE AGI #2

Independence AGI # 2

Tag Injection

Drilling Fluids Program

Prepared for

Diego Barreda

10-01-2021

Valence Drilling Fluids, LLC

12808 WCR 91

Midland, TX 79707

State: New Mexico

County: Lea

Legal SL: Sec 20, T-25-S, R-36-E

Rig: TBD

Estimated Days , Mud System, and Cumulative Cost

MD (ft)	Hole Size (in)	Drilling Days	Non –Drilling Days	Cumulative Days	Mud System	Cum. Cost
0' - 1,230'	26"	1	1	2	Fresh Water	
1,230' - 3,501'	22"	2	1	3	BDE	
3,501' - 7,174'	17.5"	3	1	4	BDE	
7,174' - 13,044'	12.25"	4	2	6	OBM	
13,044' - 16,477'	8.5"	3	2	5	OBM	
16,477' - 18,080'	5.875"	2	1	3	Fresh Water	

Products by Interval

MD (ft)	Products
0' - 1,230'	Gel, Soda Ash, Lime, Soap Sticks
1,230' - 3,501'	VX-Vis, Soda Ash, Lime, EX-23
3,501' - 7,174'	VX-Vis, Soda Ash, Lime, EX-23
7,174' - 13,044'	OBM, VG Plus, In-Force EB, In-Force OW, Lime, CaCl2, In-Force RM
13,044' - 16,477'	OBM, VG Plus, In-Force EB, In-Force OW, Lime, CaCl2, In-Force RM
16,477' - 18,080'	VX-Vis, Soda Ash, Lime

Contact List

Contact	Title	Office Phone	Cell Phone
Brad Veale	General Manager	(432) 561-8576	(972) 832-8892
Clay Gamble	Operations Manager	(432) 561-8576	(432) 770-9443
Nathan Lyons	Warehouse Manager	(432) 561-8576	(432) 269-5320

Estimated Formation Depths

Formation	Depth (TVD)	Comments
Dockum	246’	
Ochoa-Dewey	867’	
Rustler	1,130’	
Top Of Salt	1,720’	Salt
Base of Salt	3,401’	Salt
Capitan	3,977’	Possible Losses
Lamar LS	5,325’	
Bell Canyon	5,425’	Possible Losses
Brushy Canyon	7,058’	Possible Losses
Bone Spring	8,119’	Possible Pressure
1st Bone Spring Sh	9,500’	Possible Pressure
2nd Bone Spring Sh	9,994’	Possible Pressure
3rd Bone Spring Sh	11,148’	Possible Pressure
Wolfcamp Shale	11,381’	Possible Pressure
Wolfcamp B	11,593’	Possible Pressure
Strawn	11,790’	Possible Pressure
Atoka	12,733’	Possible Pressure
Morrow	13,690’	Possible Pressure
Devonian	16,103’	Possible Losses
Fusselman	17,218’	Possible Losses
Montoya	17,770’	Possible Losses
TVD	18,080’	

Drilling Fluids Summary

Surface Section - 26" Hole						
MD (ft)	Cumulative Days	Mud System	Key Points			
0' - 1,230'	2	Spud Mud	• Spud with fresh water circulating steel pits • 1 Soap Sticks per connection will help penetration rate • Circulate the hole at TD until shakers are clean			
MD (ft)	Mud Weight (ppg)	Yield Point (lbf/100ft^2)	API F.L (ml/30 min)	pH (value)	LGS (% v/v)	LCM (ppb)
0' - 1,230'	8.4 - 8.7	2 - 18	NC	<8.5	<5%	As Needed
1st Intermediate - 22" Hole						
MD (ft)	Cumulative Days	Mud System	Key Points			
1,230' - 3,501'	3	BDE	• Displace Surface with BDE • Maintain WPS above 165,000 ppm during BDE • Watch for any signs of influxes and or water flows			
MD (ft)	Mud Weight (ppg)	Yield Point (lbf/100ft^2)	API F.L (ml/30 min)	pH (value)	LGS (% v/v)	LCM (ppb)
1,230' - 3,501'	8.2 - 9.2	5-12	NC	>9.0	<8%	As Needed
2nd Intermediate - 17 1/2" Hole						
MD (ft)	Cumulative Days	Mud System	Key Points			
3,501' - 7,174'	4	BDE	• Displace Surface with BDE • Maintain WPS above 165,000 ppm during BDE • Watch for any signs of influxes and or water flows or losses in the Capitan			
MD (ft)	Mud Weight (ppg)	Yield Point (lbf/100ft^2)	API F.L (ml/30 min)	pH (value)	LGS (% v/v)	LCM (ppb)
3,501' - 7,174'	8.2 - 9.2	5-12	NC	>9.0	<8%	As Needed

Continued on next page

Drilling Fluids Summary Cont.

3rd Intermediate - 12 1/4"

MD (ft)	Cumulative Days	Mud System	Key Points
7,174' - 13,044'	6	OBM	• Displace with OBM • Maintain WPS above 280,000 ppm • Watch for any signs of influxes and or water flows

MD (ft)	Mud Weight (ppg)	Yield Point (lbf/100ft2)	HTHP F.L (ml/30 min)	ES (value)	LGS (% v/v)	LCM (ppb)
7,174' - 13,044'	10.0 - 12.0	8-14	<12cc	>400	<8%	As Needed

Production - 8.5"

MD (ft)	Cumulative Days	Mud System	Key Points
13,044' - 16,477'	5	OBM	• Displace with OBM • Maintain WPS above 280,000 ppm • Watch for any signs of influxes and or water flows

MD (ft)	Mud Weight (ppg)	Yield Point (lbf/100ft2)	HTHP F.L (ml/30 min)	ES (value)	LGS (% v/v)	LCM (ppb)
13,044' - 16,477'	11.0 - 13.0	8-14	<12cc	>400	<8%	As Needed

Production Open Hole - 5.875"

MD (ft)	Cumulative Days	Mud System	Key Points
16,477' - 17,900	3	Fresh water	• Drill out with freshwater • Pump Xan-Vis for hole cleaning sweeps • Watch for any signs of influxes and or water flows

MD (ft)	Mud Weight (ppg)	Yield Point (lbf/100ft^2)	API F.L (ml/30 min)	pH (value)	LGS (% v/v)	LCM (ppb)
16,477' - 17,900	8.4 - 8.6	NA	NC	>9.5	<5%	As Needed

End of Summary

Surface

Measured Depth (ft)	Hole Size (in)	Mud Weight (ppg)	Yield Point (lb.f/100ft2)	API F.L (ml/30 min)	pH (value)	LGS (% v/v)	Chlorides (mg/L)
0' - 1,230'	26"	8.4 - 8.7	2-18	NC	8.0 -8.5	<5%	1 - 5K
LCM (ppb)			As Needed				
Potential Hazards			Unconsolidated Formations/Lost Circulation/Drag/Torque				

Surface Section Summary

The surface section will be drilled with fresh water while pumping high vis sweeps for hole cleaning.

- Mix spud mud in suction pit using Fresh Water and Bentonite for a viscosity of 34-36 sec/quart. Maintain this viscosity circulating the working pits, jet and run water as needed to control viscosity and mud weight. Based on water quality it may be necessary to mix Soda Ash to reduce hardness below 300 ppm. This is to ensure proper Bentonite yield.
- The use of Soap Sticks may reduce bit balling and increase penetration rates. We recommend dropping one stick every connection.
- If seepage is severe or returns are lost mix in 100 bbls of Fresh Water, 1 sack Soda Ash then Bentonite for a 35 + sec/quart viscosity, Premium Blend II (8-10 ppb), LCF Blend (8-10 ppb) and Cottonseed Hulls (5 ppb). Pump the pills to the loss zone at a reduced pump rate until returns are regained.
- If circulation is not regained after the LCM pills then suggest drilling to TD on surface without returns, pumping viscous LCM pills as outlined above.
- At casing point sweep the well bore with 50 barrels of pre-mixed Fresh Water, Bentonite, Soda Ash, and Paper, having a funnel viscosity of 50-60 sec/quart.

Note: Some operators mix 50 Yellow Starch prior to casing point to thin wall cake for casing run.

1st Intermediate

Measured Depth (ft)	Hole Size (in)	Mud Weight (ppg)	Yield Point (lb.f/100ft2)	API F.L (ml/30 min)	pH (value)	LGS (% v/v)	Chlorides (mg/L)
1,230' - 3,501'	22"	9.8-10.1	NC	NC	>9.0	<5%	>165K
LCM (ppb)			As Needed				
Potential Hazards			Lost Circulation/Water Influxes/H2S/Drag/Torque				

Intermediate Section Summary

This section will be drilled with BDE utilizing the steel pit's for volume.

- In steel pits drill out with Brine Water from under surface casing. If BDE mud is already available from previous well use stored mud to drill out surface.
- Start additions of 1 ppb Xan-Vis once drilling the formation has started.
- Start additions of Diesel until desired weight is reached .
- After Diesel is added begin adding .25% - .33% gal/bbl of EX-23.
- Xan-Vis can be utilized for sweeps as needed to clean hole.
- Add Lime to maintain pH above 9.0.
- Use additions of brine water for hydration of mud do not use fresh water in this system.
- The BDE Mud will work best with less than 8% LGS, the best solids control efficiency practices available should always be implemented. If centrifuge is available use during this section nonstop after Xan-Vis has sheared in system.
- Severe losses are to be treated by pumping a Lost Circulation pill made by filling the slug pit with 100 barrels of Fresh Water. Mix 1 Soda Ash then Xan-Vis for a 34-36 sec/quart viscosity, LCF Blend (5-10 ppb), Nutshell (5-10 ppb), and Mica (5-10 ppb).
- Use two linear shakers with 140 mesh screens. We Recommend to use finer screens after 24 hours of drilling.
- Make sure to adjust pump rate to ensure proper hole cleaning.
- We recommend maintain a minimum "safe" mud weight in this interval to control losses/cost.
- If H2S is encountered, we recommend the use of an H2S Scavenger for personnel protection and a Filming Amine to protect the tubulars. Increase the pH with Lime to 11.5.

Note: It is imperative that we diligently monitor for signs of water influxes and/or flows. These may include but are not limited to changes in fluid color, rapidly decreasing PH, a noted increase on flow meter, etc. If a potential influx or flow is detected, it is imperative that there is immediate communication between the mud engineer, company man, drilling engineer, and all parties involved to discuss procedures going forward.

2nd Intermediate

Measured Depth (ft)	Hole Size (in)	Mud Weight (ppg)	Yield Point (lb.f/100ft2)	API F.L (ml/30 min)	pH (value)	LGS (% v/v)	Chlorides (mg/L)
3,501' - 7,174'	17.5"	8.2-9.2	4-12	NC	>9.0	<8%	>165K
LCM (ppb)			As Needed				
Potential Hazards			Lost Circulation/Water Influxes/H2S/Drag/Torque				

Intermediate II Section Summary

The 2nd intermediate will be with BDE utilizing the steel pit's for volume.

- Use mud from 1st Intermediate to drill 2nd Intermediate.
- Start additions of Diesel/Brine Water until desired weight is reached .
- After Diesel is added begin adding .25% - .33% gal/bbl of EX-23.
- Add Lime to maintain pH above 9.0.
- Use additions of brine water for hydration of mud do not use fresh water in this system.
- The BDE Mud will work best with less than 8% LGS, the best solids control efficiency practices available should always be implemented. If centrifuge is available use during this section nonstop after Xan-Vis has sheared in system.
- Severe losses are to be treated by pumping a Lost Circulation pill made by filling the slug pit with 100 barrels of Fresh Water. Mix 1 Soda Ash then Xan-Vis for a 34-36 sec/quart viscosity, LCF Blend (5-10 ppb), Nutshell (5-10 ppb), and Mica (5-10 ppb).
- Use two linear shakers with 140 mesh screens. We Recommend to use finer screens after 24 hours of drilling.
- We recommend maintain a minimum "safe" mud weight in this interval to control losses/cost.
- If H2S is encountered, we recommend the use of an H2S Scavenger for personnel protection and a Filming Amine to protect the tubulars. Increase the pH with Lime to 11.5.
- If losses are encountered in Capitain and are unable to be re-established suggest switching system to Freshwater and dry drill to section TD while pumping high viscosity sweeps to ensure hole cleaning.

Note: It is imperative that we diligently monitor for signs of water influxes and/or flows. These may include but are not limited to changes in fluid color, rapidly decreasing PH, a noted increase on flow meter, etc. If a potential influx or flow is detected, it is imperative that there is immediate communication between the mud engineer, company man, drilling engineer, and all parties involved to discuss procedures going forward.

3rd Intermediate

Measured Depth (ft)	Hole Size (in)	Mud Weight (ppg)	Yield Point (lb.f/100ft2)	HTHP F.L (ml/30 min)	ES (value)	LGS (% v/v)	Chlorides (mg/L)
7,174' - 13,044'	12.25"	10.0-12.0	8-14	<15cc	>400	<8%	>280K
LCM (ppb)			As Needed				
Possible Hazards			Water Flows, Gas Kicks				

Production Section Summary

The 3rd intermediate will be drilled with OBM, it will be important to control the solids content of this system to maximize performance.

- Drill out from under 2nd Intermediate with OBM in steel pits.
- Displace 10.0-10.5 ppg OBM Fluid.
- Increase MW as required for pressure control and wellbore stability.
- Keep Low Gravity Solids below 8% in the lateral.
- Maintain Chloride levels above 280,000 to control inhibition.
- Maintain 45-55 sec/quart viscosity.
- Maintain Electrical Stability above 400.
- Maintain Oil/Water ratio of 80/20 to 75/25.
- Drill ahead adjusting properties to meet hole conditions.
- Adjust low end rheology with In-Force RM as needed for hole cleaning.
- Add Gilsonite as needed to maintain <15cc fluid loss control with no free water.
- Use torque, drag, and fill on connections as indicators to increase mud weight or chlorides.
- G-Seal may be added to enhance penetration rates while sliding and as needed for lost circulation.
- Use two linear shakers with 140 mesh screens. You may opt to use finer screens after 24 hours of drilling.
- We recommend maintaining a minimum "safe" mud weight in this interval to control losses/costs.

Note: It is imperative that we diligently monitor for signs of water influxes and/or flows. These may include but are not limited to changes in fluid color, rapidly decreasing PH, a noted increase on flow meter, etc. If a potential influx or flow is detected, it is imperative that there is immediate communication between the mud engineer, company man, drilling engineer, and all parties involved to discuss procedures going forward.

4th Intermediate

Measured Depth (ft)	Hole Size (in)	Mud Weight (ppg)	Yield Point (lb.f/100ft2)	HTHP F.L (ml/30 min)	ES (value)	LGS (% v/v)	Chlorides (mg/L)
13,044' - 16,477'	8.5"	11.0-13.0	8-14	<15cc	>400	<8%	>280K
LCM (ppb)			As Needed				
Potential Hazards			Lost Circulation/Water Influxes/H2S/Drag/Torque				

Intermediate II Section Summary

The 4th intermediate will be drilled with OBM, it will be important to control the solids content of this system to maximize performance.

- Drill out from under 3rd Intermediate with OBM in steel pits.
- Displace 11.0 ppg OBM Fluid.
- Increase MW as required for pressure control and wellbore stability.
- Keep Low Gravity Solids below 8% in the lateral.
- Maintain Chloride levels above 280,000 to control inhibition.
- Maintain 45-55 sec/quart viscosity.
- Maintain Electrical Stability above 400.
- Maintain Oil/Water ratio of 80/20 to 75/25.
- Drill ahead adjusting properties to meet hole conditions.
- Adjust low end rheology with In-Force RM as needed for hole cleaning.
- Add Gilsonite as needed to maintain <15cc fluid loss control with no free water.
- Use torque, drag, and fill on connections as indicators to increase mud weight or chlorides.
- G-Seal may be added to enhance penetration rates while sliding and as needed for lost circulation.
- Use two linear shakers with 140 mesh screens. You may opt to use finer screens after 24 hours of drilling.
- We recommend maintaining a minimum "safe" mud weight in this interval to control losses/costs.

Note: It is imperative that we diligently monitor for signs of water influxes and/or flows. These may include but are not limited to changes in fluid color, rapidly decreasing PH, a noted increase on flow meter, etc. If a potential influx or flow is detected, it is imperative that there is immediate communication between the mud engineer, company man, drilling engineer, and all parties involved to discuss procedures going forward.

Open Hole

Measured Depth (ft)	Hole Size (in)	Mud Weight (ppg)	Yield Point (lbf/100ft^2)	API F.L (ml/30 min)	pH (value)	LGS (% v/v)	Chlorides (mg/L)
16,477' - 18,080'	5.875"	8.4 - 8.6	NA	NC	>9.5	<5%	<50K
LCM (ppb)			Acid Soluble LCM				
Possible Hazards			Losses				

Open Hole Section Summary

The open hole section will be drilled with freshwater and VX-Vis sweeps and it will be important to control mud weight for wellbore stability. Use only acid soluble LCM if losses occur.

- Drill out production casing with fresh water in steel pits.
- Maintain >9.5 pH with Lime mixed through the chemical barrel. Do not mix Lime through the mud hopper. Use all PPE when mixing.
- Use Xan-Vis at a 45-50 sec/quart for sweeps as needed for hole cleaning.
- Severe losses are to be treated by pumping an Acid Soluble Lost Circulation pill made by filling the slug pit with 100 barrels of Cut Brine mixing 1 sack Soda Ash. Then mix VX-Vis for a 38 sec/quart viscosity, Calcium Carbonate (5–10 ppb), Magma Fiber (5 –10 ppb), and Clean Seal (5-10 ppb).
- We recommend 140 mesh screens if mud up is required for logging. After 12 to 24 hours of drilling adjust screens to 210+.
- 200' prior to TD begin additions of Xan-Vis for 40-42 sec/quart viscosity and also lower filtrate control below 8cc while using White Starch **if logs are desired**.
- While mudded up add Bio-Force, 10 gal/tour for bacteria control.
- If packer fluid is required can be provided upon request.
- In this section only pump Acid soluble LCM.