

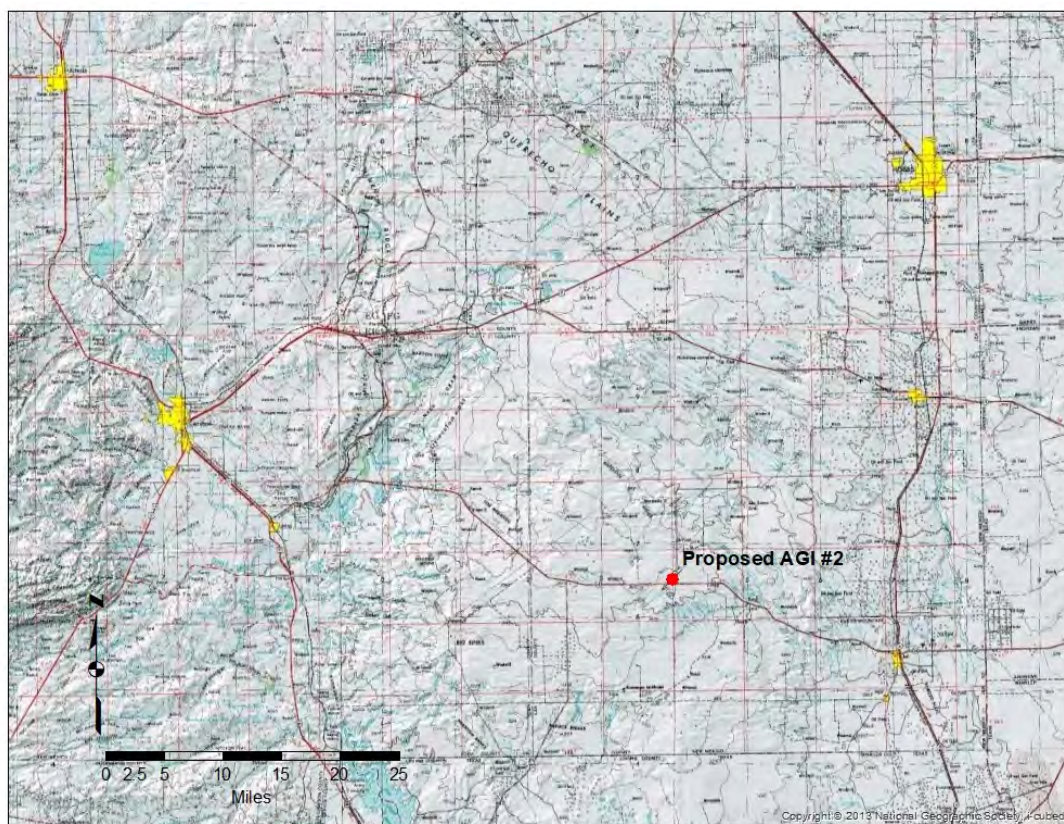


Application for a Redundant Class II AGI Well Lucid Energy Delaware, LLC

Red Hills AGI #2

AGI #2 Location: 1800' FSL & 150' FEL Section 13, T24S, R33E

Lea County, New Mexico



August 8, 2019

Prepared for:

**Lucid Energy Delaware, LLC
3100 McKinnon, St. 800
Dallas, TX 75201**

Prepared by:

**Geolex, Inc.
500 Marquette Avenue, NW, Suite 1350
Albuquerque, New Mexico 87102
(505)-842-8000**

APPLICATION FOR AUTHORIZATION TO INJECT

- I. PURPOSE: _____ Secondary Recovery _____ Pressure Maintenance X Disposal _____ Storage
Application qualifies for administrative approval? _____ Yes X No
- II. OPERATOR: Lucid Energy Delaware, LLC.
ADDRESS: 3100 McKinnon, St. 800, Dallas, TX 75201
CONTACT PARTY: Alberto A. Gutierrez, R.G.- GEOLEX, INC. PHONE: (505)-842-8000
- 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. **A CROSS REFERENCE TO THE APPLICABLE SECTIONS OR APPENDICES IN THE ATTACHED C108 APPLICATION FOR EACH ROMAN NUMERAL BELOW IS SPECIFIED BY SECTION AND/OR APPENDIX NUMBERS.**
- IV. Is this an expansion of an existing project? _____ X _____ Yes _____ No
If yes, give the Division order number authorizing the project: _____ Orders R-13507 – 13507F _____
- 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 and 6; APPENDICES A and B.**
- VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.
SECTION 5; APPENDIX A.
- VII. Attach data on the proposed operation, including:
1. Proposed average and maximum daily rate and volume of fluids to be injected; **SECTIONS 1, 2, and 3**
 2. Whether the system is open or closed; **SECTIONS 1, 2, 4 and 7**
 3. Proposed average and maximum injection pressure; **SECTIONS 1 and 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 and 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 and 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 4 and 5 and APPENDIX A**
- IX. Describe the proposed stimulation program, if any. N/A
- *X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted). **WELLS ARE NOT YET DRILLED**
- *XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken. **SECTION 4.5**
- XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.
SECTION 7
- XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form. **APPENDIX B**
- 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. Gutierrez, C.P.G. TITLE: President, Geolex, Inc.®; Consultant to Lucid Energy Delaware, LLC

SIGNATURE: _____ DATE: 08/8/2019

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: **SEE ATTACHED APPLICATION**

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.

AGI #2 Surface: 1800' FSL, 150' FEL Section 13, T24S, R33E, - SECTIONS 1, 3 and 4.

(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. **SEE SECTION 3 FOR PROPOSED WELL DESIGNS. FINAL DESIGNS WILL BE SUBMITTED WHEN PROPOSED WELLS ARE DRILLED AND COMPLETED.**

(3) A description of the tubing to be used including its size, lining material, and setting depth. **SECTION 3 AND FIGURE 5 FOR PROPOSED WELL DESIGN**

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used. **SECTION 3**

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. **SECTIONS 1 and 4**

(2) The injection interval and whether it is perforated or open-hole. **SECTION 3**

(3) State if the well was drilled for injection or, if not, the original purpose of the well. **N/A- WELLS NOT YET DRILLED**

(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. **N/A**

(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. **SECTIONS 4 and 5; APPENDICES A and B**

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. **SECTION 5; APPENDIX B WE WILL NOTIFY OPERATORS AND LEASEHOLD OWNERS AND SURFACE OWNERS WITHIN THE AREA OF REVIEW PURSUANT TO NMOC D REGULATIONS AND WE WILL SUBMIT AFFIDAVITS OF PUBLICATION OF NOTICE AND CERTIFIED MAIL RETURN RECEIPTS AT HEARING.**

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: **SEE APPENDIX B FOR DRAFT OF PUBLIC NOTICE – AFFIDAVIT OF PUBLICATION OF NOTICE FROM NEWSPAPER WILL BE PROVIDED BY THE COMMISSION PRIOR TO THE HEARING.**

(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 Lucid Energy Delaware, LLC (Lucid), 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 injection well (Lucid Red Hills AGI #2) at the Lucid Red Hills Gas Plant in Section 13, T24S, R33E approximately 20 miles west of Jal in Lea County, New Mexico (Figure 1).

Currently, Lucid is currently authorized to inject a total of up to 13 million standard cubic feet per day (MMSCFD) of treated acid gas (TAG) in the currently-approved Red Hills AGI #1 (3002540448) under NMOCC Orders R-13507 – 13507F. This injection authority is in the Delaware Formations. While Lucid is requesting the approval of this well in part as a redundant well for enhanced operational reliability, Lucid is requesting an ability to inject a full 13MMSCFD into the proposed well regardless of the amount being injected into the existing Delaware well. This additional well will provide increased capacity for the Red Hills plant expansion and accommodate the ability to sequester additional significant amounts of CO₂. Therefore, since the wells are in two completely distinct and unconnected geological formations with nearly 8500 feet of vertical separation, this application requests a full 13 MMSCFD of overall increased injection authority but still keeping the maximum allowed into any one of the two wells to 13MMSCFD. This submission is a separate application for a new redundant well in the deeper Devonian/Wristen/Fusselman Formations with the same approved maximum injection rate of 13 MMSCFD for each of the two wells. The New Mexico Oil Conservation Division (NMOCD) has recommended that all operators whose plants rely on the operation of a single AGI well that it is preferable to have a redundant well in the event that maintenance is required on either well.

The Red Hills AGI #2 will be drilled as a vertical well with the surface location at approximately 1,800 feet from the south line (FSL) and 150 feet from the east line (FEL) of Section 13 (Figure 2). The proposed injection zones will be in the Devonian and Upper Silurian Wristen and Fusselman Formations, at depths of approximately 16,000 to 17,600 feet. Analysis of the reservoir characteristics of these units confirms that they act as excellent closed-system reservoirs that will accommodate the future needs of Lucid for disposal of acid gas and sequestration of CO₂ from the Red Hills Plant.

Lucid is currently permitted to safely inject up to a maximum of 13 MMSCFD of TAG into the Red Hills AGI#1 located in the Delaware. The flow of TAG from the Red Hills Plant expansion will be divided between the wells such that the amount of TAG flowing into each of the two wells will not exceed the 13 MMSCFD limit or the maximum allowable operating pressure (MAOP) in either well. The flow of TAG will be divided between the wells according to operational requirements and the ability of each well to take the flow under the approved MAOP. Geologic studies conducted for the selection of this location demonstrate that the proposed injection zone is readily capable of accepting and containing the proposed acid gas and CO₂ injection volumes within NMOCD's recommended maximum injection pressures.

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

- Identification and characterization of all hydrocarbon-producing zones of wells that surround and are present on the proposed plant site.
- The depths of perforated pay intervals in those wells relative to the depth of the target injection zones (Devonian, Wristen and Fusselman).
- The past and current uses of the proposed injection interval.
- Total feet of net porosity in the proposed Devonian, Wristen and Fusselman injection intervals.

- The stratigraphic and structural setting of the targeted injection zone relative to any nearby active or plugged wells, and other wells penetrating the interval.
- The identification of and sample notification letter that will be sent to all surface owners within a one-mile radius of the proposed injection wells.
- The identification of all wells within a two-mile radius and of all operators, lessees and surface owners within a one-mile area of review of the proposed injection well.
- Identification and characterization of all active and plugged wells within the one-mile area of review of the proposed injection well.
- The details of the proposed injection operation, including general well design and average and maximum daily rates of injection and injection pressures.
- Sources and predicted composition of injection fluid and compatibility with the formation fluid of the injection zone.
- Review of any potential induced seismicity in the area and modeling of any possible fault movement due to injection.
- Location and identification of any fresh water bearing zones in the area; the depth and quality of available groundwater in the vicinity of the proposed well, including a determination that there are no structures which could possibly communicate the disposal zone with any known sources of drinking water.
- A Rule 11 Plan has been approved for the facility. Once approval has been granted for the Red Hills AGI #2, the Rule 11 Plan will be amended to reflect the changes in operations. If it is anticipated that a change may occur in the amount or concentrations of H₂S in the TAG stream, an update to the approved Rule 11 H₂S Contingency Plan may be required. At a minimum even if H₂S volumes remain the same and the proposed well is successfully completed in the Devonian, Wristen and Fusselman interval, the Rule 11 plan will be amended to reflect this change. The revised Rule 11 Plan will be submitted to NMOCD for the file prior to commencement of TAG injection into the Red Hills AGI #2 well.

Based upon this detailed evaluation, as summarized in this application, Lucid has determined that the proposed AGI well is a safe and environmentally-sound project for the disposal of acid gas. Furthermore, the project provides additional environmental benefit by permanently sequestering a significant volume of CO₂ which would otherwise be released to the atmosphere if H₂S was flared or if a sulfur reduction unit (SRU) was operated at the Plant.

Our research has identified porous and permeable carbonate units within this proposed injection zone including the Devonian, Wristen and Fusselman formations, located approximately 16,000 to 17,600 feet below the plant. These formations are sufficiently isolated from active pay zones above by hundreds of feet of tight, Mississippian limestones and shales, including the immediately overlying Woodford Shale.

At the anticipated reservoir conditions of 225° F and 7,500 psi, each MMSCFD of TAG will occupy a volume of 2,282 cubic feet (406 barrels). At the anticipated maximum operational capacity of 13 MMSCFD, the compressed TAG will occupy 29,671 cubic feet (5,285 barrels) per day. If only the proposed AGI#2 were to be used to take the entire permitted flow, after 30 years of operation, the TAG would occupy an area of approximately 161 acres in the proposed injection zone, or a radius of approximately 1,494 feet (0.28 miles) from the Red Hills AGI #2 well.

Fifty recorded wells were identified in the two-mile radius of the proposed AGI location (see Appendix A for details). Of these 50 wells in the two-mile radius, 29 are active and 12 are plugged and abandoned, and 9 are permitted and are pending drilling (Appendix A).

Within one mile of the proposed AGI there are 13 recorded wells, of which 8 are active and 5 are plugged and abandoned. None of the wells within one mile of the proposed Red Hills AGI #2 pose any risk to act as potential conduits that would allow escape of injection fluids from the proposed injection zone.

The closest well penetrating the proposed injection zone (EOG Resources 3002525604) is 17,635 feet deep, lies approximately 0.72 miles from the proposed AGI well, and was plugged and abandoned in December of 2004. During the initial drilling and completion of the well in May of 1978, the well was plugged back to 14,590 feet, isolating the deeper Devonian zone (top Devonian at 15,853).

The next closest well (EOG Resources 3002533815) is 16,085 feet deep and is 1.31 miles from the proposed AGI well. This well was a dry hole and was plugged and abandoned in September of 1997, approximately three months after its spud date. Records show that the deeper Devonian zone was properly plugged and isolated.

The active NGL Water Solutions Striker 6 SWD 002 (3002544291) is 1.25 miles from the proposed AGI and is 17,705 feet deep and was spudded in January of 2018. The distance of this well from the proposed AGI #2 is over 4 times the calculated plume radius of injection. NGL has agreed to limit injection in this well to 20,000 BPD.

To assess the potential for injection-related seismic activity, Geolex conducted an induced-seismicity risk assessment in the area of the proposed Red Hills AGI #2 utilizing the Stanford Center for Induced and Triggered Seismicity's (SCITS) Fault Slip Potential (FSP) model. Using this model, a 30-year, eight-disposal well scenario was simulated to (1) characterize the change in reservoir pressure in response to the injection scenario, and (2) estimate the slip probability of faults as a result of the predicted changes in reservoir pressure. Results of the model simulation suggest that faults within the area of review do not display significant potential for induced-seismic activity and the approval of the Red Hills AGI #2 will not result in a significant increase in local reservoir pressure.

Active leases in the one-mile area are operated by COG Operating, LLC, Devon Energy Production Company, LP., EOG Resources, Inc., Kaiser-Francis Oil Company, Lucid Energy Delaware, LLC, Matador Production Company and WPX Energy Permian, LLC.

Oil and gas mineral rights in this area are owned by private parties and the United States (managed by the Bureau of Land Management). Surface owners within a one-mile radius include the United States (managed by the BLM), Lucid, and 22 other entities. All surface and mineral owners, operators, and leasehold owners within a one-mile radius of the proposed injection well will be notified and provided with a copy of this application at least 20 days prior to the NMOCC hearing pursuant to the requirements of NMOCC. Details on all operators, lessees, and surface and mineral owners are included in Appendix B.

There is no permanent body of surface water within several miles of the plant. A search of the New Mexico State Engineer's files shows 15 water wells within two miles of the proposed AGI. Data from these wells show that groundwater occurs at a depth of approximately 100-650 feet, and is hosted by alluvium and the Triassic red beds. Groundwater from the Rustler formation (1,245 to 1,600-foot depth) has total dissolved solids generally exceeding 9,000 mg/L in many parts of southeastern New Mexico (Lambert, 1992).

The approved Rule 11 H2S Contingency Plan for the facility is being revised to accommodate the proposed redundant well and will be submitted to NMOCD when complete to obtain approval prior to operating the proposed well.

2.0 INTRODUCTION AND ORGANIZATION OF THIS C-108 APPLICATION

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

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

- A detailed description of the location, construction and operation of the proposed injection well (Section 3.0)
- A summary of the regional and local geology, the hydrogeology, and the location of drinking water wells within the area of review (Section 4.0)
- An analysis of the potential for induced seismicity due to injection from the proposed well and other injection wells in the immediate vicinity (Section 4.5).
- 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 land owners that are located within the area of review (Section 6.0)
- An affirmative statement, based on the analysis of geological conditions at the site, that there is no hydraulic connection between the proposed injection zone and any known sources of drinking water (Section 7.0)

In addition, this application includes the following supporting information:

- **Appendix A:** Spreadsheets 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 reports for wells which penetrate the proposed injection zone.
- **Appendix B:** Tables summarizing the operators, lessees, and surface owners in the one-mile radius area of review; an example of the notification letter that will be sent out to them at least 20 days prior to the NMOCC hearing; and a draft public notice.

3.0 PROPOSED CONSTRUCTION AND OPERATION OF LUCID RED HILLS AGI #2

The Red Hills AGI #2 will be drilled at 1,800 feet from the south line (FSL) and 150 feet from the west line (FWL) of Section 19 T19S, R32E (Figure 2).

TAG from the plant's sweeteners will be routed to a central compressor facility, located west of the well head. Compressed TAG will then be routed to the wells via high-pressure rated lines. Figure 3 is a schematic of the proposed new AGI facilities.

3.1 CALCULATED MAXIMUM INJECTION 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 data, the TAG stream used for the following calculations will be approximately:

- 87% CO₂
- 12% H₂S
- 1% Trace Components of C₁ – C₆ and Nitrogen

The maximum total volume of TAG to be injected daily will be approximately 13 MMSCFD, although this volume will not be reached for a number of years based on market conditions. Pressure reduction valves and controls will be incorporated to assure that maximum surface injection pressure allowed by NMOCD will not be exceeded.

The specific gravity of TAG is dependent on the temperature and pressure conditions and the composition of the fluid mixture. It is most accurately calculated using a modification of the Peng-Robinson (PR) equation of state (EOS) model (Boyle and Carroll, 2002). We have calculated the specific gravity of the supercritical TAG phase for the proposed Lucid injection stream using the AQUALibrium 3.1 software which employs the modified PR EOS model (Table 1).

We have modeled the proposed maximum daily injection 13 MMSCF TAG composed of 87 mol % CO₂ and 12 mole % H₂S. Specific gravities of TAG were determined for the conditions at the well head (pressure = 1,800 psi, temperature = 90°F) and the bottom of the well (pressure = 7,500 psi, temperature = 225°F). The specific gravity of TAG at equilibrium with the reservoir (pressure = 7,500 psi, temperature = 225°F) was also determined to evaluate the area expected to be affected by injection in the reservoir (see Table 1 and Section 4.4).

The calculated maximum allowable injection pressure (MAOP) would be approximately 4,814 psi (depending on specific gravity of final TAG stream). We have used the following method approved by NMOCD to calculate the proposed MAOP. The final maximum permitted surface injection pressure should be based on the final specific gravity of the injection stream according to the following formula:

$$IP_{\max} = PG (D_{\text{top}}) \quad \text{where:} \quad \begin{array}{l} IP_{\max} = \text{maximum surface injection pressure (psi)} \\ PG = \text{pressure gradient of injection fluid (psi/ft)} \\ D_{\text{top}} = \text{depth at top of perforated interval of injection zone (ft)} \end{array}$$

and $PG = 0.2 + 0.433 (1.04 - SG_{\text{tag}})$ where:

SG_{tag} = average specific gravity of treated acid gas in the tubing (SG_{tag} at top = 0.780 and SG_{tag} at bottom hole = 0.828; see Table 1)

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

$$SG_{\text{tag}} = 0.8035 \text{ (Average of 0.78 and 0.828)}$$

$$D_{\text{top}} = 16,000 \text{ ft}$$

Therefore:

$$PG = 0.2 + 0.433 (1.04 - 0.807) = 0.3024 \text{ psi/ft}$$

$$IP_{\max} = PG (D_{\text{top}}) = 0.3024 * 16,000 = 4,838 \text{ psi}$$

For this reason, Lucid Midstream requests approval for a MAOP of 4,838 psig at the surface for Red Hills AGI #2.

3.2 INJECTION VOLUME CALCULATIONS

Table 1 below summarizes the calculated injection volumes, the areas impacted by the TAG plume, and the proposed MAOP.

The calculated TAG plume, after 30 years of continuous injection at 13 MMSCFG, will occupy an area of approximately 161 acres, with a radius of 1,492 feet or 0.28 miles (Figure 4). The values of porosity and residual water (S_{wr}) have been calculated from analysis of geophysical logs from nearby wells with data from the proposed injection zone.

Table 1 – Reservoir Injection Pressure and Volume Calculations**PROPOSED INJECTION STREAM CHARACTERISTICS**

TAG	H ₂ S	CO ₂	H ₂ S	CO ₂	TAG
Gas vol	conc.	conc.	inject rate	inject rate	inject rate
MMSCFD	mol %	mol %	lb/day	lb/day	lb/day
13	12	87	148079	1386338	1534418

CONDITIONS AT WELL HEAD

Well Head Conditions		TAG							
Temp	Pressure	Gas vol	Comp	Inject Rate	Density ¹	SG ²	density	volume	volume
F	psi	MMSCFD	CO ₂ :H ₂ S	lb/day	kg/m ³		lb/gal	ft ³	bbl
90	1800	13	87:12	1534418	779.00	0.78	6.50	31537	5617

CONDITIONS AT BOTTOM OF WELL

Injection Zone Conditions					TAG				
Temp	Pressure ³	Depth ^{top}	Depth ^{bottom}	Thickness ⁴	Density ¹	SG ²	density	volume	volume
F	psi	ft	ft	ft	kg/m ³		lb/gal	ft ³	bbl
225	7500	16000	17600	1600	828.00	0.83	6.91	29671	5285

CONDITIONS IN RESERVOIR AT EQUILIBRIUM

Injection Reservoir Conditions					TAG				
Temp ⁵	Pressure ³	Ave. Porosity ⁶	Swr	Porosity	Density ¹	SG ²	density	volume	volume
F	psi	%		ft	kg/m ³		lb/gal	ft ³	bbl
225	7500	3.5	0.17	46.48	828.00	0.83	6.91	29671	5285

CONSTANTS

SCF/mol			
Molar volume at STD			
0.7915			
g/mol		lb/mol	
Molar weight of H ₂ S		34.0809	
Molar weight of CO ₂		44.0096	
Molar weight of H ₂ O		18.015	

¹ Density calculated using AQUALIBrium software² Specific gravity calculated assuming a constant density for water³ PP is extrapolated using successful Drill Stem Tests at nearby wells⁴ Thickness is the average total thickness of porous units in the reservoir zone⁵ Reservoir temp. is extrapolated from bottomhole temp. measured at nearby wells⁶ Porosity is estimated using geophysical logs from nearby wells**CALCULATION OF MAXIMUM INJECTION PRESSURE LIMITATION**

SG _{TAG}	0.8035
PG = 0.2 + 0.433 (1.04-SG _{TAG})	0.3024 psi/ft
IP _{max} = PG * Depth	4838 psi

Where: SG_{TAG} is specific gravity of TAG; PG is calculated pressure gradient; and IP_{max} is calculated maximum injection pressure.**CALCULATION OF 30 YEAR AREA OF INJECTION**

Cubic Feet/day (5.6146 ft ³ /bbl)	29671	ft ³ /day
Cubic Feet/30 years	325114745	ft ³ /30 years
Area = V/Net Porosity (ft)	6994723	ft ² /30 years
Area = V/Net Porosity (ft) (43560 ft ² /acre)	160.6	acres/30 years
Radius =	1492	ft
Radius =	0.28	miles

3.3 WELL DESIGN

The AGI facilities and wells are integrated components of the Lucid Gas Plant design. The schematic of the AGI facilities and tie-in to the Lucid Gas Plant are shown in Figure 3, and the preliminary well design for the new injection well is shown on Figure 5. The tubing and cement details of the well design may be modified after review with BLM. Since the subsurface mineral rights are owned by the United States, all well designs and drilling operations and testing will be conducted in accordance with the regulations and guidance provided by the governing agency, the BLM.

The well will have four strings of the telescoping casing. The upper three segments will be cemented to the surface, and the final liner will be cemented through its annulus and to 200 feet inside the second intermediate. The injection tubing will include a subsurface safety valve on the production tubing to assure that fluid cannot flow back out of the well in the event of a failure of the injection equipment

(Figure 5). In addition, the annular space between the production tubing and the well bore will be filled with an inert fluid (corrosion-inhibited diesel fuel) as a further safety measure which is consistent with injection well designs which have been previously approved by NMOCD for acid gas injection. The final well design will be approved by BLM as the well will be a BLM-led well.

The well will be advanced vertically to its anticipated total depth of approximately 17,600 feet. The injection zone (16,000 to 17,600 feet) will be completed as an open hole interval.

Design and material considerations include: Placement of Subsurface Safety Valve (SSSV) and the packer; triple casing through freshwater resources (Ogallala and Santa Rosa Formations – groundwater, Rustler – saline groundwater); characterization of the zone of injection; and a total depth (TD) ensuring identification of the reservoir. All casing strings will be cemented to the surface and the cement jobs will be verified by pressure testing. Radial 360° cement bond logs will be conducted for all casing strings as well.

A suitable drilling rig will be chosen for the job that will include an appropriate blowout preventer and choke manifold for any unforeseen pressures encountered. Visual inspections of cement returns to the surface will be noted in both the conductor and surface pipe casing jobs. Casing and cement integrity will be demonstrated by pressure-testing and 360-degree cement bond logging after each cement job.

The three casing and one liner strings shown in Figure 5 are summarized in Table 2 below:

Table 2: Summary of Casing Schedules

	Borehole (in)	OD (in)	Lb/ft	Grade	Thread	Top (ft)	Bottom (ft)	Length (ft)
Conductor	36	30	118		WELDED	0	100	100
Surface	26	20.0	106.5	J55	BTC	0	1350	1350
Intermediate_1	17.50	13.375	72	NT-80	BTC	0	6100	6100
Intermediate_2	12.25	9.625	47	HCL 80	BTC	0	6200	2300
	12.25	9.625	47	Vallourec	VAM	6200	6700	3900
	12.25	9.625	47	HCL 80	BTC	6700	10000	500
	12.25	9.625	53.5	HCL 80	BTC	10000	12300	5600
Liner	8.625	7.000	32	HPP 110	BTC	12100	15700	3600
	8.625	7.000	32	Vallourec	VAM	15700	16000	300
Tubing	na	3.500	9.2	L80	VAM	0	15700	15700
	na	3.500	9.2	Inconel G3	VAM	15700	16000	300
Open Hole	5.875	na	na	na	na	16000	17600	1600

The conductor and surface casing will be cemented to the surface, using appropriate conventional cement and methods. These cement jobs will be pressure tested after allowing an appropriate amount of time to set.

The 6,100-foot segment of 9.625-inch casing (Intermediate 1) will be cemented to the surface in two stages, with diverter valve depths selected according to geological and mud logging data.

The 500 foot, 9.625-inch casing Intermediate 2 segment will be constructed with Vallourec (or equivalent) corrosive resistant alloy (CRA) material, as this casing will pass through the existing injection zone of AGI #1. The annulus surrounding the 500-foot section will be cemented with Halliburton Well-Lock™ (or equivalent) which is strongly resistant to corrosive fluids and gasses. These cement jobs will also be pressure tested after allowing an appropriate amount of time to set. Once the liner is set up and tested the open hole section will be drilled with a 5.875" bit to the total depth of approximately 17,600 feet.

The 7" production liner will be constructed of two materials. The upper segment of conventional steel will be emplaced between 12,100 and 15,700 feet, and the final segment from 15,700 to 16,000 feet will be made of Vallourec (or equivalent) corrosive-resistant alloy. The upper part of the liner will be set between 12,100 and 12,300 feet allowing 200 feet of overlap between the liner and the 9 5/8" second intermediate casing. The borehole and the overlap containing the liner will be cemented with appropriate corrosion-resistant cement.

The proposed open hole logging suite for the surface and intermediate sections will consist of Caliper, Natural Gamma, Dual Induction and Density-Neutron-Gamma Ray Porosity. In addition, a Fracture Matrix Identification (FMI) log will be run in the Devonian and upper Silurian Wristen and Fusselman target reservoir units. Sidewall cores will also be collected from the tight caprock above the Devonian and in the Devonian and upper Silurian Wristen and Fusselman. Representative core samples will be analyzed in the laboratory to determine caprock and reservoir permeabilities and porosity.

After completion of the open-hole section the well head will be installed on the top of the casing strings. A casing integrity test (pressure test) will be performed to test the casing prior to releasing the rig. After a successful test and the drilling rig release, a work-over rig will be mobilized to location and a cement bond log will be run to ascertain the quality of the cement bond of the liner. It is important that a good bond be established around the injection interval as well as below the CRA joint to minimize any chances that acid gases mixed with formation water do not travel up the outside of the casing and negatively impact the integrity of the casing job.

Once the integrity of the cement job has been determined a temporary string of removable packer and tubing will be run, and injection tests (step tests) will be performed to determine the final injection pressures and volumes. Once the reservoirs have been tested, the final completion string will include a permanent corrosion-resistant packer at approximately 15,950 feet. Tubing will consist of approximately 15,650 feet of 3 1/2-inch 9.3 ppf, L80 VAM top premium thread tubing, and the final 300 feet of tubing (15,650-15,950 feet) immediately above the packer will be constructed of Inconel CRA material, or equivalent.

Permanent, continuous-recording sensors will be incorporated into the packer assembly and appropriate connections will be run through the annulus and out of the well head. These sensors will provide real-time temperature and pressure for the reservoir measured at the packer depth. Data will be transmitted to the plant's control room for observation, analysis and recording. Section 3.4 below addresses how that data will be used and supplemented in the event of downhole sensor failure.

The SSSV will be run into the well at a depth of approximately 250 feet. A 1/4-inch Inconel line will connect the SSSV to a hydraulic panel at the surface.

The National Association of Corrosion Engineers (NACE) issues guidelines for metals exposed to various corrosive gases like the ones in this well. For a H₂S/CO₂ stream of acid gas that is de-watered at the surface through successive stages of compression, downhole components such as the SSSV and packer need to be constructed of Inconel 925. The CRA joints will be constructed of a similar alloy from a

manufacturer such as Sumitomo. A product like SM2550 (with 50% nickel content) will likely be used. The gates, bonnets and valve stems within the Christmas tree will be nickel coated as well. The rest of the Christmas tree will be made 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 at the compressor and the wellhead shut-in using a hydraulically operated wing valve on the Christmas 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 able to accept the volume of injection fluid (without using acid gas), it will be completed with the approved injection equipment for the acid gas stream.

3.4 RESERVOIR TESTING AND PRESSURE MONITORING

The Red Hills AGI #2 will be equipped with bottom hole pressure and temperature monitoring equipment as is currently installed in Red Hills AGI #1. This equipment is designed to provide real-time monitoring of reservoir conditions as it is installed immediately above the packer. While this equipment is useful in gathering data that will ultimately be used to evaluate reservoir and well performance, it is only a portion of the overall data collection and analysis program to evaluate the reservoir over time and to compare the predicted reservoir performance discussed above in Section 3.2 with actual performance at any future reporting period. The current approved NMOCC order requires a report which evaluates predicted vs. observed reservoir performance after 10 years of operation.

The collection and analysis of injection and annular pressure data has a two-fold purpose. The primary purpose being to provide an early warning of any mechanical well issues which may arise and the second purpose is 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 the performance of the reservoir. Surface pressure/temperature/annular pressure monitoring equipment has extremely high reliability. In contrast, our initial 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. While Lucid continues to make a constant effort to improve performance and reliability, we have developed a process to assure necessary data are collected in the event of bottom hole sensor failures. The simultaneous collection of the surface and bottom hole data allows us develop empirical relationships with actual observed data that, in conjunction with the use of established models (such as AqualibriumTM or equivalent) will allow us to fill in gaps when bottom hole data loss occurs due to sensor or data transmission failures. This approach will allow us to provide NMOCD with reliable monitoring data and interpretations and provides the basis for the reservoir evaluation which will be performed periodically during the lifetime of the well.

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

1. Obtain initial bottom hole pressure and temperature after drilling (during logging).
2. Perform detailed SRT and 10-day falloff test to provide baseline reservoir data prior to injection.
3. Monitor surface parameters (injection pressure, temperature and rate, and annular pressure) to provide early warning system for any potential mechanical issues in the well.
4. Monitor bottom hole pressure/temperature with a device to provide real time reservoir condition data for analysis of reservoir performance.
5. Use bottom hole reservoir and surface pressure/temperature data to develop well-specific empirical relationship between observed surface and bottom hole data.
6. Use TAG/wellbore models to predict bottom hole P/T conditions based on surface data and test with empirical relationships observed in #5 above to calibrate models.

7. Use surface data along with tools in #5 and #6 above to fill in missing bottom hole data when data drops or sensor failure occurs.
8. In the event of an extended period of bottom-hole pressure/temperature sensor failure, perform periodic bottom hole pressure monitoring using slickline pressure bombs only if data from such temporary device is necessary to fill in data for relevant analyses. After approximately 10 years of operation, perform another detailed SRT and falloff test to compare with baseline prior to injection.

4.0 REGIONAL AND LOCAL GEOLOGY AND HYDROGEOLOGY

4.1 GENERAL GEOLOGIC SETTING/SURFICIAL GEOLOGY

The Lucid Gas Plant is located in Section 19, T 19 S, R 32 E, in Lea County, New Mexico, about 35 miles west of Hobbs (Figure 1). The plant location is within a portion of the Pecos River basin referred to as the Querecho Plains reach (Nicholson & Clebsch, 1961). This area is relatively flat and largely covered by sand dunes underlain by a hard caliche surface. The dune sands are locally stabilized with shin oak, mesquite and some burr-grass. There are no natural surface bodies of water or groundwater discharge sites within one mile of the Plant and where drainages exist in interdunal areas, they are ephemeral, discontinuous, dry washes. The proposed plant site is underlain by Quaternary alluvium overlying the Triassic redbeds of the Santa Rosa Formation (Dockum Group), both of which are local sources of groundwater. The thick sequences of Permian through Ordovician rocks that underlie these deposits are described generally below.

4.2 BEDROCK GEOLOGY

The plant and the proposed well are located at the northern margin of the Delaware Basin, a sub-basin of the larger, encompassing Permian Basin (Figure 6), which covers a large area of southeastern New Mexico and west Texas. The Permian Basin lies within the area of the larger, ancestral (pre-Mississippian) Tabosa Basin, which covered an area that included the entire present-day Permian Basin area and beyond. The Tabosa Basin was a shallow sub-tropical basin throughout the period between the Ordovician and early Mississippian (Osagean). The Permian Basin as we know it today began to take form during the Middle to Late Mississippian, with various segments (Delaware and Midland Basins, Central Basin Platform, North Platforms) 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 7 is a generalized stratigraphic column showing the formations 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. The result of this exposure was development of systems of karst-related secondary porosity, which included solution-enlargement of fractures and vugs, and development of small cavities and caves. Particularly in the Fusselman, solution features from temporally-distinct karst events became interconnected with each successive episode, so there could be some degree of vertical continuity in parts of the Fusselman section that could lead to enhanced vertical and horizontal permeability.

In this immediate area of the Permian Basin, major tectonic activity was primarily confined to the lower Paleozoic section, where seismic data shows major faulting and ancillary fracturing affected rocks only as high up as the lower Woodford Shale (Figures 8 and 9). Faulting higher in the section that is related to the Hercynian orogeny is more prevalent closer to the Central Basin Platform margins and the northern margins of the Northwest Shelf.

The sub-Woodford Paleozoic rocks extend down to the Ordovician Ellenburger Formation, which sit on the basement over a veneer of Early Ordovician sandstones and granite wash. The Ellenburger is comprised of dolomites and limestones, and is up to several hundred feet thick. It is overlain by about

400 feet of Ordovician Simpson sandstones and tight limestones, in turn overlain by about 400 feet of Montoya cherty carbonates.

The Silurian Fusselman and Wristen, and Devonian Thirty-one Formations overlie the Montoya, 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 Osagean limestone, which is overlain by several hundred feet of shales and basal limestones of the Upper Mississippian Chester Formation. The Pennsylvanian Morrow, Atoka, Strawn, and a starved section of Cisco-Canyon complete the pre-Permian section. Within this entire sequence, the Morrow is a major gas producing zone, with smaller contributions from the Atoka and Strawn. The proposed Silurian-Devonian injection zone does not produce economic hydrocarbons for more than 15 miles away from the well site.

The Permian rocks found in the Delaware Basin are divided into four series, the Ochoa (most recent), Guadalupe, Leonard, and Wolfcamp (oldest) (Figure 7). Numerous oil and gas pools have been identified in these rocks. In the area of the proposed Red Hills AGI #2 well, the rocks consist predominately of clastic rocks – primarily sands, and shales with lesser carbonates. Producing reservoirs are concentrated in the high porosity sands. Local oil production is largely restricted to the Delaware Sands pool (overlying the injection zone in the Lucid AGI #1), and gas production is dispersed through the deeper Bone Springs (the “Avalon”) and Wolfcamp.

There have been no commercially significant deposits of oil or gas found in the Devonian or Silurian rocks (the proposed injection zone), in the vicinity of the well. Adjacent wells have shown that these formations are “wet,” and there is no current or foreseeable production at these depths within the one-mile radius (Figure 12) of review. In fact, these zones are routinely approved as produced-water disposal zones in this area.

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. Based on the geologic analyses of the subsurface at the Lucid Gas Plant, we recommend acid gas injection and CO₂ sequestration in the Siluro-Devonian Formations. The proposed injection interval includes a number of intervals of dolomites and dolomitic limestones with moderate to high primary porosity, and secondary, solution-enlarged porosity that is related to karst events that periodically occurred throughout the section, most notably in the Fusselman Formation. These karst events produced solution cavities and enlarged fractures throughout the section, which can be substantial enough to provide additional permeability that is not readily apparent on well logs. The porous zones are separated by tight limestones and dolomites.

The Siluro-Devonian interval has excellent cap rocks above, below and between the individual porous carbonate units. There are no producing zones within or below the Siluro-Devonian in the area of the proposed well, and the injection interval is separated from the nearest producing zone (Morrow) by 20 feet of Woodford shale, 550 feet of tight Osagean limestones, and nearly 350 feet of tight Chesterian shales and deep water limestones (Figure 10). It lies a minimum of 1,200 feet above the Precambrian basement.

Faults that have been identified in the area are normal faults associated with the Central Platform to the east of the proposed well site (Figure 8). The closest fault lies approximately 1.5 miles east of the proposed site, and has approximately 1,000 feet of down-to-the-west structural relief (Figure 9). This is well away from the final plume radius of 0.20 miles (Table 1).

The overlying Chester, Osage and Woodford Formations provide over 1,000 feet of shale and intervening tight limestones, providing an effective seal on the top of the injection zone. The proposed injection interval is located more than 1,000 feet below the Morrow Formation, which is the deepest potential pay zone in the area. There are no pay zones below the injection zone in the area (see Figures 7 and 10).

No direct measurements have been made of the injection zone porosity or permeability. However, satisfactory injectivity of the injection zone can be inferred from the porosity logs described above. The zone will be logged and cored in the AGI well to obtain site-specific porosity and permeability data.

4.4 FORMATION FLUID CHEMISTRY

A review of formation waters from the U.S. Geological Survey National Produced Waters Geochemical Database v2.1 (10/16/2014) identified 10 wells with analyses from drill stem test fluids collected from the Devonian, Silurian-Devonian or Fusselman Formations, in wells within approximately 12 miles of the proposed Red Hills AGI #2 (Townships 18 to 20 South and Ranges 30 to 33 East).

These analyses showed Total Dissolved Solids ranging from 20,669 to 40,731 milligrams per liter (mg/l) with an average of 28,942 mg/l. The primary anion is chloride, and the concentrations range from 11,176 to 23,530 mg/l with an average of 16,170 mg/l.

An attempt will be made to sample formation fluids during drilling or completion of the well to provide more site-specific fluid properties.

4.5 POTENTIAL FOR INDUCED SEISMICITY IN THE AREA

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

In review of the proposed Red Hills AGI #2 location, Geolex identified three faults within the Siluro-Devonian injection interval that may have the potential for induced-seismic activity (Figure 11). For inclusion in the FSP model, these features (Faults 1, 2, and 3) were separated into ten fault segments (Faults 1-5, 6-7, and 8-10, respectively), which allows the model to assess non-linear features. To calculate the fault-slip probability for this injection scenario, input parameters characterizing the local stress field, reservoir characteristics, sub-surface features, and injected fluids are required. Parameters utilized and their sources for this study are included in Table 3 below. Additionally, Table 4 details the injection volume characteristics and locations of the disposal wells modeled in this scenario.

Two proposed SWD wells in the area that Lucid originally objected to are the Permian Oilfield Partners Deep Thirst and the NGL Water Solutions Trident well. Even though these wells are not currently approved, NGL and Permian Oilfield Partners agreed with Lucid that if the injection rates at these locations would be limited to 20,000 BPD, Lucid would remove their objections.

Since Lucid has dropped their objection to these wells, if held to 20,000 BPD, we have included them in our Induced Seismicity Model, as shown in this section.

Table 3. Input parameters and source material for FSP simulations

Modeled Parameter	Input Value	Variability (+/-)	UOM	Source
<i>Stress</i>				
Vertical Stress Gradient	1.05	0.105	psi ft ⁻¹	Nearby well estimate
Max Horizontal Stress Direction	N75E	5	Deg.	Lund Snee & Zoback, 2018
Reference Depth	17,030		ft	Nearby well evaluation
Initial Res. Pressure Gradient	0.43	0.043	psi ft ⁻¹	Lund Snee & Zoback, 2018
A _φ Parameter	0.6	0.06	-	Lund Snee & Zoback, 2018
Reference Friction Coefficient (μ)	0.6	0.06	-	Standard Value
<i>Hydrologic</i>				
Aquifer Thickness	700	10	ft	Nearby well evaluation
Porosity	3	0.5	%	Nearby well evaluation
Permeability	10	5	mD	Nearby well evaluation
<i>Material properties</i>				
Density (Water)	1000	50	kg m ⁻³	Standard Value
Dynamic Viscosity (Water)	0.0008	0.0001	Pa.s	Standard Value
Fluid Compressibility (water)	3.6 x 10 ⁻¹⁰	0	Pa ⁻¹	Standard Value
Rock Compressibility	1.08 x 10 ⁻⁹	0	Pa ⁻¹	Standard Value
<i>Acid gas @ 210 °F, 6,700 psi</i>				
Density	811.00	-	kg m ⁻³	AQUALibrium™
Dynamic Viscosity	0.0000787	-	Pa.s	AQUALibrium™

Table 4. Location and characteristics of injection wells modeled in FSP assessment.

#	API	Well Name	Latitude	Longitude	Volume (bbls/day)	Start (year)	End (year)
1	TBD	Red Hills AGI #2	32.215378	-103.518021	6,000	2020	2050
2	30-025-44291	Striker 6 SWD #2	32.208049	-103.49742	32,500	2018	2050
3	30-025-45085	Brininstool SWD #4	32.269289	-103.542198	31,500	2020	2050
4	30-025-42448	Madera SWD #1	32.211484	-103.442864	20,000	2016	2050
5	30-025-44661	Moomaw SWD #1	32.191228	-103.422569	30,000	2019	2050
6	TBD	Trident SWD (proposed)	32.2218	-103.5338	20,000	2020	2050
7	30-025-44387	Leviathan State SWD #1	32.313965	-103.500200	30,000	2020	2050
8	TBD	Deep Thirst (proposed)	32.2076	-103.3816	20,000	2020	2050

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 modeled utilizing the characteristics of a SWD. This approach yields a more conservative probability prediction as water displays greater density, dynamic viscosity, and is significantly less compressible than acid gas. Characteristics of acid gas at reservoir conditions, as modeled by AQUAlibrium, are shown in Table 3.

Generally, faults considered in this assessment do not display significant potential for injection-induced slip and the proposed Red Hills AGI #2 is not predicted by the FSP model to contribute significantly to the total resultant pressure front. Only fault 6 shows any observable increase in slip probability (0.03) throughout the 30-year modeled scenario (Figure 12). Table 5 below summarizes the predicted pressure change along each fault and suggests that no features within the area display an increased risk of slip in response to injection. Furthermore, subsequent simulations in which injection from the proposed AGI well is excluded suggest minimal change in the model-derived fault-slip probability as shown in Table 5.

Table 5. Summary of model-simulation results showing the required pressure change to induce fault slip, actual pressure change as predicted by the FSP model, probability of fault slip at the end of the 30-year injection scenario, and fault slip probability when proposed AGI is excluded

Fault #	Δ Pressure necessary to induce fault slip	Actual Δ Pressure at fault midpoint at year 2050	Fault Slip Potential at year 2050	Fault Slip Potential excluding AGI
1	6,010 psi	766 psi	0.00	0.00
2	3,353 psi	905 psi	0.00	0.00
3	6,373 psi	1,209 psi	0.00	0.00
4	6,948 psi	2,047 psi	0.00	0.00
5	5,830 psi	1,022 psi	0.00	0.00
6	1,920 psi	663 psi	0.03	0.02
7	6,906 psi	1,023 psi	0.00	0.00
8	3,136 psi	144 psi	0.00	0.00
9	4,100 psi	470 psi	0.00	0.00
10	4,925 psi	899 psi	0.00	0.00

4.6 GROUNDWATER HYDROLOGY IN THE VICINITY OF THE PROPOSED INJECTION WELL

Based on the New Mexico Water Rights Database from the New Mexico Office of the State Engineer, there are 15 freshwater wells located within a two-mile radius of the Lucid Red Hills AGI #2 well, and only 2 water wells within one mile; the closest water well is located 0.31 miles away and has a total depth of 650 feet (Figure 13; Table 6). All wells within the two-mile radius are shallow, collecting water from about 60 to 650 feet depth, in Alluvium and the Triassic redbeds. The shallow freshwater aquifer is protected by the surface and intermediate casings in the proposed Lucid Red Hills AGI #2 well, which extend to 1,375 feet and 6,700 feet, respectively.

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

Table 6: Water Wells Identified by the New Mexico State Engineer's Files within One Mile of the Proposed Red Hills AGI #2 Well

POD Number	County	Sec	Tws	Rng	UTME	UTMN	Distance (mi)	Depth Well (ft)	Depth Water (ft)	Water Column (ft)
C 03666 POD1	LE	13	24S	33E	639132	3565078	0.31	650	390	260
C 03917 POD1	LE	13	24S	33E	638374	3565212	0.79	600	420	180
C 03601 POD1	LE	23	24S	33E	638124	3563937	1.17			
C 02309	LE	25	24S	33E	639638	3562994	1.29	60	30	30
C 03601 POD3	LE	24	24S	33E	638142	3563413	1.38			
C 03932 POD8	LE	7	24S	34E	641120	3566769	1.40	72		
C 03601 POD2	LE	23	24S	33E	637846	3563588	1.44			
C 03662 POD1	LE	23	24S	33E	637342	3564428	1.48	550	110	440
C 03601 POD5	LE	23	24S	33E	637988	3563334	1.48			
C 03601 POD6	LE	23	24S	33E	637834	3563338	1.55			
C 03601 POD7	LE	23	24S	33E	637946	3563170	1.58			
C 03600 POD2	LE	25	24S	33E	638824	3562329	1.78			
C 03602 POD2	LE	25	24S	33E	638824	3562329	1.78			
C 03600 POD1	LE	26	24S	33E	637275	3563023	1.94			
C 03600 POD3	LE	26	24S	33E	637784	3562340	2.05			

Our analysis confirms that the proposed well poses no risk of contaminating groundwater in the area. There are no potential conduits that would allow migration of injected fluids to fresh-water zones.

5.0 OIL AND GAS WELLS IN THE LUCID AGI AREA OF REVIEW AND VICINITY

Within a two-mile radius of the proposed Red Hills AGI #2 location, NMOCD records identify a total of 50 wells (12 plugged and abandoned or temporarily plugged, 29 active). There are also 9 well applications approved and awaiting drilling (see Appendix A).

Fifty-five wells were identified in the one-mile radius of the proposed AGI location, of which 29 are active, 24 are plugged, and 2 are pending. There is no current production in the proposed injection zone in this area.

Three wells within the 2-mile radius penetrate the injection zone (deeper than 16,000 feet TVD):

- EOG Resources Government Com 001 (P&A), API #3002525604, TVD = 17,625', 0.72 miles from proposed AGI #2
- NGL Water Solutions Striker 6 SWD 002, (Active), API #3002544291, TVD = 17,765', 1.25 miles from proposed AGI #2
- EOG Resources Bell Lake 7 Unit 001 (P&A), API #3002533815, TVD = 16,085', 1.31 miles from proposed AGI #2

None of these wells potentially impact the injection zone's calculated 30-year radius of 0.28 miles. NGL Water Solutions has agreed to limit their injection rate in the Striker 6 SWD 002 to 20,000 barrels per day, further reducing the potential for pressure interference in the injection zone.

All of the wells identified are listed in Table A-1 in Appendix A, which includes the locations, depths, status, operators and distances of the wells from the AGI well locations.

There are 13 reported wells within one mile of the proposed AGI #2. Of these 8 are active and 5 are plugged and abandoned (Table 7).

One of these wells (EOG Resources Government Com 001 (P&A), API #3002525604) penetrated the Devonian zone during initial completion in May 1978. Testing showed that there were no economical hydrocarbons in this zone, and the well's liner and production casing were cemented and plugged back to 14,590' (over 1,000 feet above the 16,000' top of the proposed injection zone) in May of 1978. The well was completely plugged and abandoned in December of 2003. The plugging conditions and the distance of this well from the injection point indicate that this well poses no hazard for TAG migration to shallower zones. Plugging documentation of this well is included in Appendix A.

Figure 14 shows the locations of the 13 wells within the area of interest, and Table 7 below summarizes the relevant information for those wells.

Figure 15 shows the geometry of producing wells in the general area. All active production in this area is targeted for the Bone Spring and Wolfcamp zones, at depths of 8,900 to 11,800 feet, the Strawn (11,800 to 12,100 feet) and the Morrow (12,700 to 13,500 feet). All of these productive zones lie at least 2,500 feet above the proposed injection zone at 16,000 feet.

Table 7: Wells Located Within One Mile of the Proposed Red Hills AGI #2

API	OPERATOR	WELLNAME	SPUDDATE	PLUGDATE	TVDDEPTH	STATUS	DIST(Miles)
3002540448	LUCID ENERGY DELAWARE, LLC	RED HILLS AGI 001	23-Oct-13		6650	Active	0.00
3002508371	BYARD BENNETT	J L HOLLAND ETAL 001	24-Feb-61	8-Mar-61	5425	Plugged	0.33
3002526958	BOPCO, L.P.	SIMS 001	4/13/1981	26-Dec-07	15007	Plugged	0.34
3002526369	EOG RESOURCES INC	GOVERNMENT L COM 002	15-Sep-79	8-Oct-90	14698	Plugged	0.38
3002541384	COG OPERATING LLC	DECKARD FEDERAL COM 004H	1-Jun-14		11103	Active	0.67
3002541687	COG OPERATING LLC	SEBASTIAN FEDERAL COM 001H	1-Feb-15		10944	Active	0.68
3002525604	EOG RESOURCES INC	GOVERNMENT L COM 001	3-Oct-77	30-Dec-04	17625	Plugged	0.72
3002541383	COG OPERATING LLC	DECKARD FEDERAL COM 003H	30-Aug-14		11162	Active	0.75
3002541666	COG OPERATING LLC	SEBASTIAN FEDERAL COM 002H	24-Feb-15		10927	Active	0.76
3002527491	SOUTHLAND ROYALTY CO	SMITH FEDERAL 001	19-Oct-81	10-Aug-86	15120	Plugged	0.80
3002541382	COG OPERATING LLC	DECKARD FEDERAL COM 002H	3-Jun-14		11067	Active	0.88
3002541688	COG OPERATING LLC	SEBASTIAN FEDERAL COM 003H	3-Aug-14		11055	Active	0.93
3002529008	EOG RESOURCES INC	MADERA RIDGE 24 001	7-Nov-84		15600	Active	1.00

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

Geolex contracted with Elkhorn Land & Title, LLC, of Roswell, New Mexico to research land records in Lea and Eddy Counties to obtain a listing of all operators, oil, gas and mineral lessees, and surface owners within a one-mile radius of the proposed AGI well. Appendix B includes the results from that search.

Appendix B also contains a draft notice letter which will accompany the application when the individual letters are sent. These notices will be sent out as soon as the NMOCC assigns a case number and sets a date for the hearing. A draft public notice for the Commission secretary is also included in Appendix B.

Table B-1 provides the surface and mineral owners in the one-mile area of review. Table B-2 is the list of operators and Table B-3 is a list of mineral leasehold owners. These Tables comprise the universe of persons that must be notified 20 days prior to the NMOCC hearing.

Table B-4 is a full summary of the land status by Tract. Figure B-1 includes maps showing surface and mineral ownership by tract in the area of review. The original land status reports from Elkhorn are also included in Appendix B.

7.0 AFFIRMATIVE STATEMENT OF LACK OF HYDRAULIC CONNECTION BETWEEN 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 Lucid 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, 4 and 5 above including related appendices.

Based on this investigation and 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 with any known sources of drinking water or oil or gas production in the vicinity as described above in Sections 4 and 5 of this application.

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

Alberto A, Gutierrez, R.G
President
Geolex, Inc.



Date: August 8, 2019

8.0 REFERENCES

- Madalyn S. Blondes, Kathleen D. Gans, James J. Thordsen, Mark E. Reidy, Burt Thomas, Mark A. Engle, Yousif K. Kharaka, and Elizabeth L. Rowan, 2014. U.S. Geological Survey National Produced Waters Geochemical Database v2.1, <http://energy.usgs.gov/EnvironmentalAspects/EnvironmentalAspectsofEnergyProductionandUse/ProducedWaters.aspx>
- Boyle, T.B., Carroll, J.J., 2002. Study determines best methods for calculating acid-gas density. *Oil and Gas Journal* 100 (2): 45-53.
- Lambert, S.J., 1992. Geochemistry of the Waste Isolation Pilot Plant (WIPP) site, southeastern New Mexico, U.S.A. *Applied Geochemistry* 7: 513-531.
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- Powers, D.W., Lambert, S. J., Shafer, S., Hill, L. R. and Weart, W. D., 1978., *Geological Characteristic Report, Waste Isolation Pilot Plant (WIPP) Site, Southeastern New Mexico (SAND78-1596)*, Department 4510, Waste Management Technology, Sandia Laboratories, Albuquerque, New Mexico
- Silver, B.A., Todd, R.G., 1969. Permian cyclic strata, northern Midland and Delaware Basins, west Texas and southeastern New Mexico, *The American Association of Petroleum Geologists Bulletin* 53: 2223-2251.
- Ward, R.F., Kendall, C.G.St.C., Harris, P.M., 1986. Upper Permian (Guadalupian) facies and their association with hydrocarbons – Permian Basin, west Texas and New Mexico. *The American Association of Petroleum Geologists Bulletin* 70: 239-262
- Walsh, R., Zoback, M.D., Pasi, D., Weingarten, M. and Tyrrell, T., 2017, FSP 1.0: A Program for Probabilistic Estimation of Fault Slip Potential Resulting from Fluid Injection, User Guide from the Stanford Center for Induced and Triggered Seismicity, available from SCITS.Stanford.edu/software

FIGURES

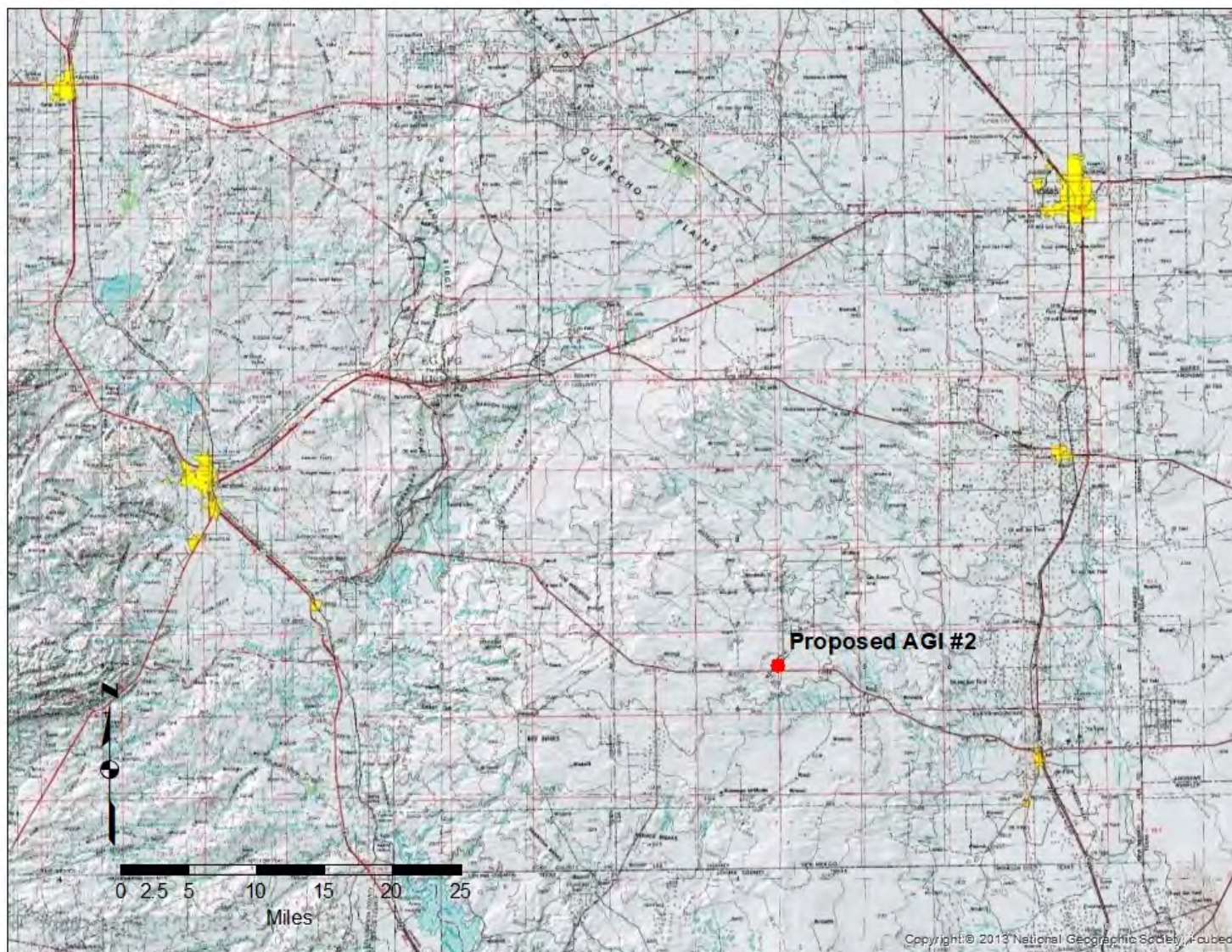


Figure 1: Location of Lucid Energy Proposed AGI #2



Figure 2: Detailed Location of Lucid Energy Existing AGI #1 Well and Proposed AGI#2 Well

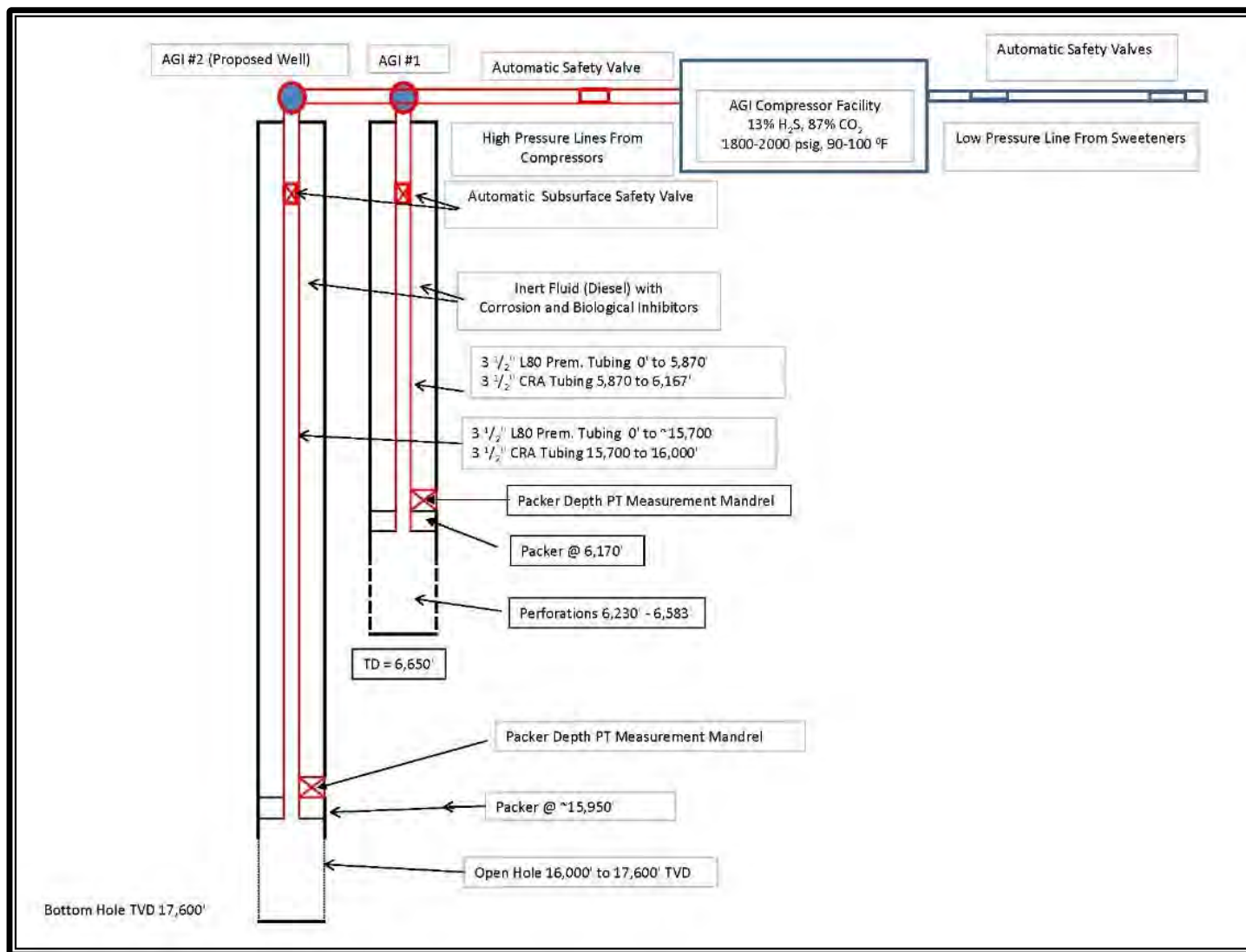


Figure 3: Schematic of Surface Facilities and Wells, Lucid Red Hills Gas Plant

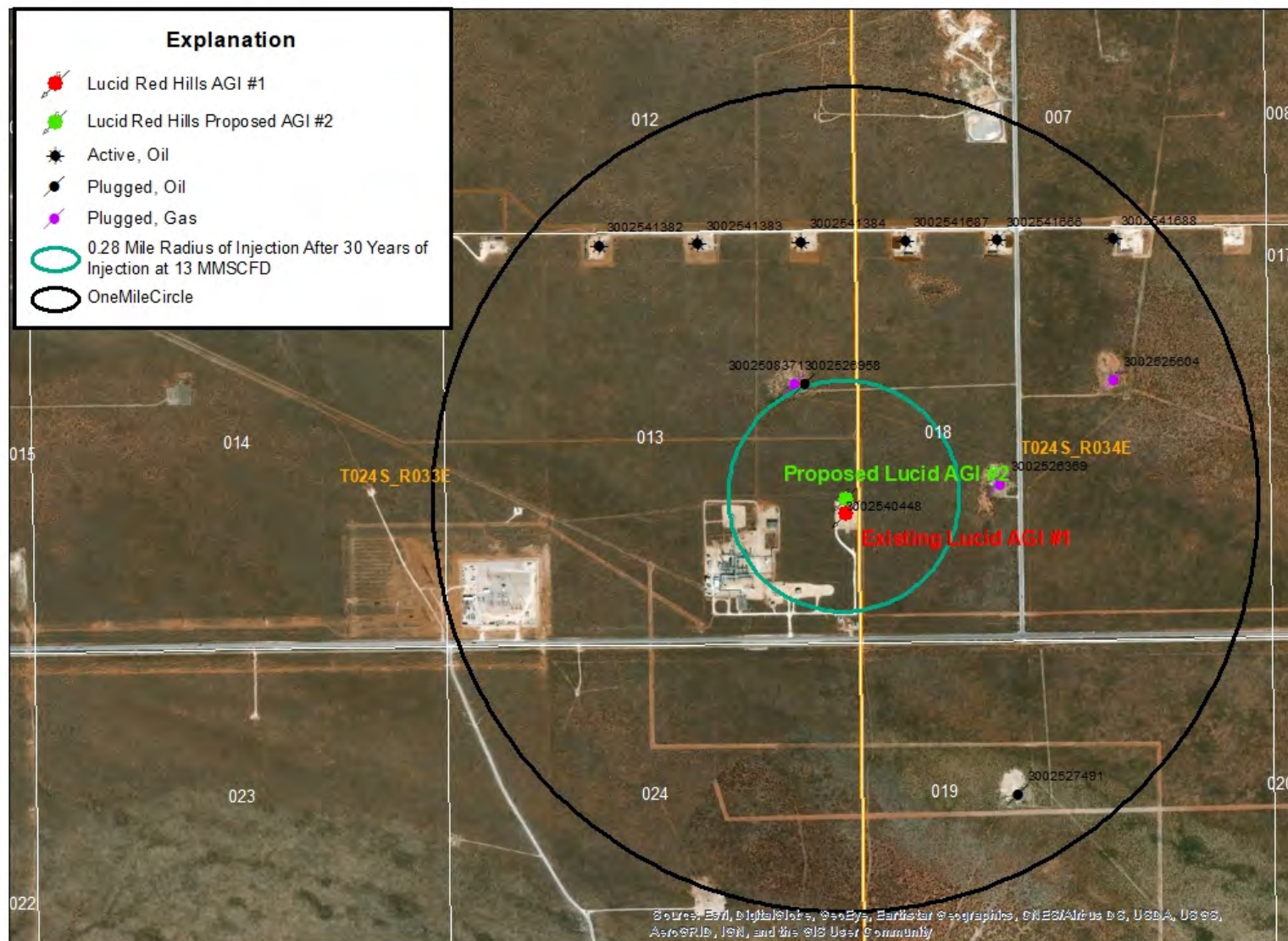


Figure 4: Calculated Radius of Injection after 30 Years of Operation at 13 MMSCFD

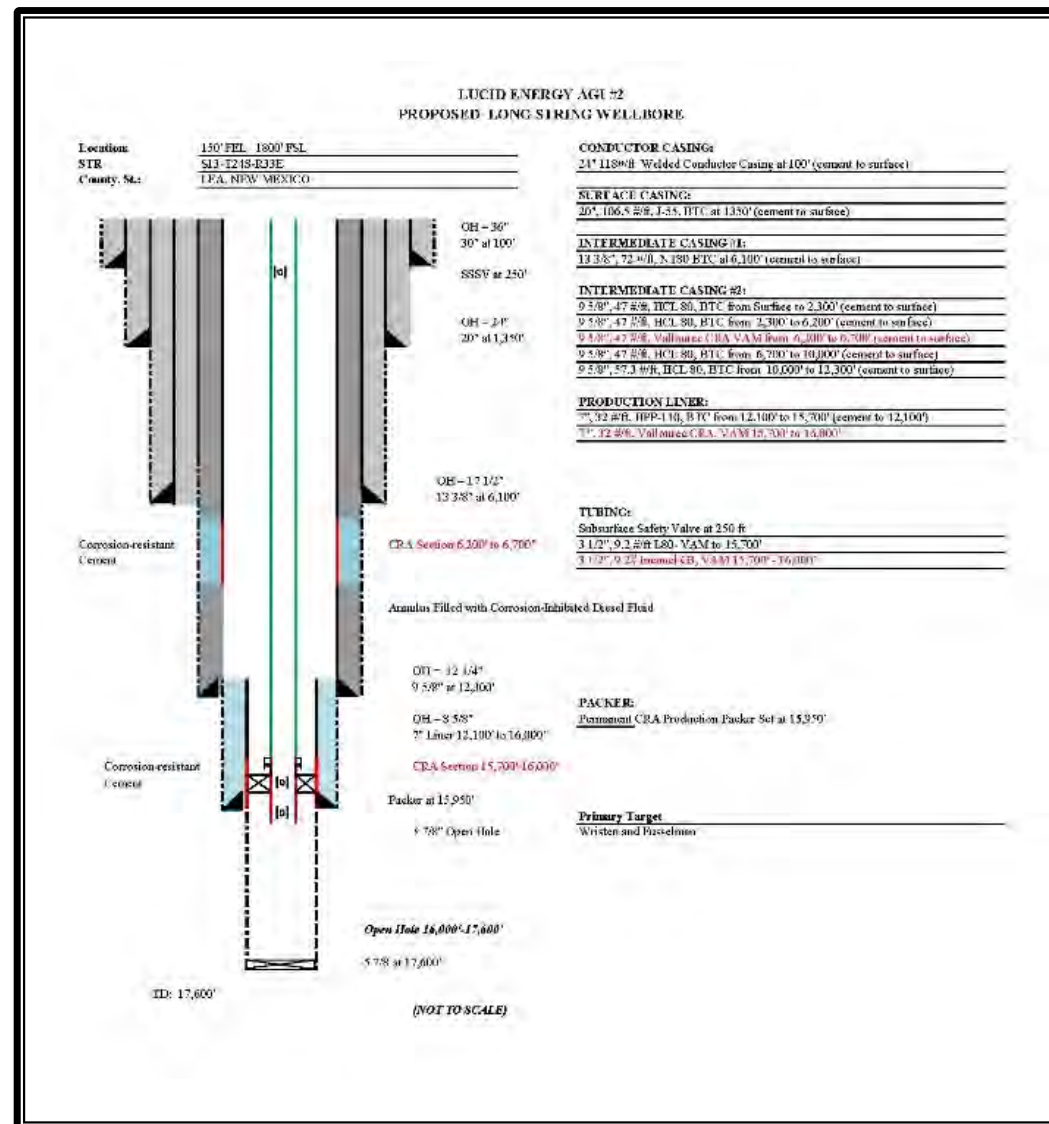


Figure 5: Schematic of Proposed AGI #2 Wellbore

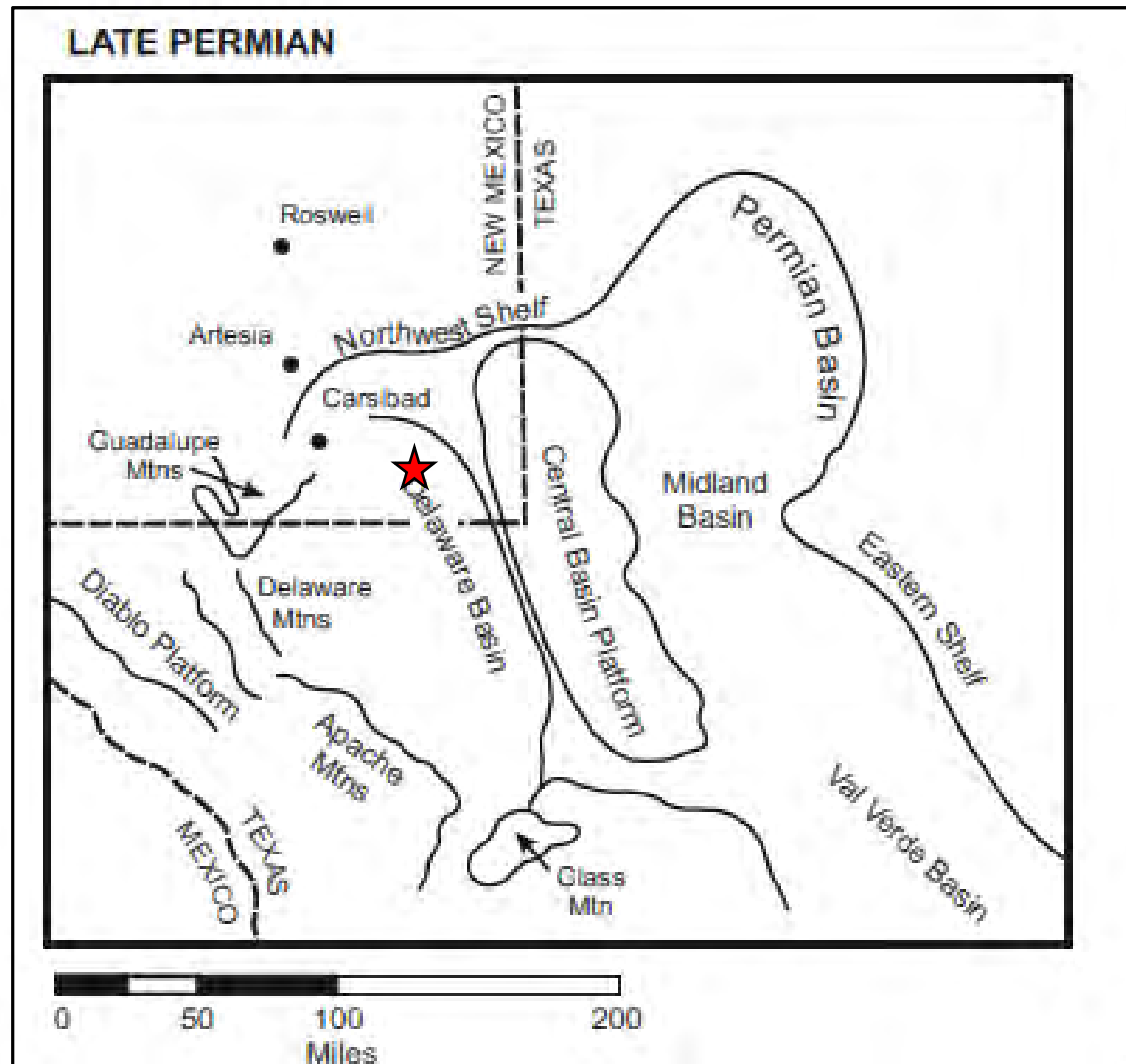


Figure 6: Structural features of the Permian Basin during the Late Permian

Location of the proposed Lucid AGI #2D well is shown by the red star.

(Modified from Ward, et al (1968))

Stratigraphy and generalized lithologies of the subsurface formations underlying the proposed AGI #2 location. Zones with active pay within the radii of investigation are shown by the red stars. The interval shown by the blue bar includes the Devonian (Thirtyone Formation), and Silurian Wristen and Fusselman Formations, which contain intervals of karst-related solution-enlarged and fracture porosity in dolomites that alternate with tight, dolomitic limestones. These formations are sufficiently isolated from the active pay zones by over 1,300 feet of tight, Mississippian (Chester through upper Woodford) limestones and shales.

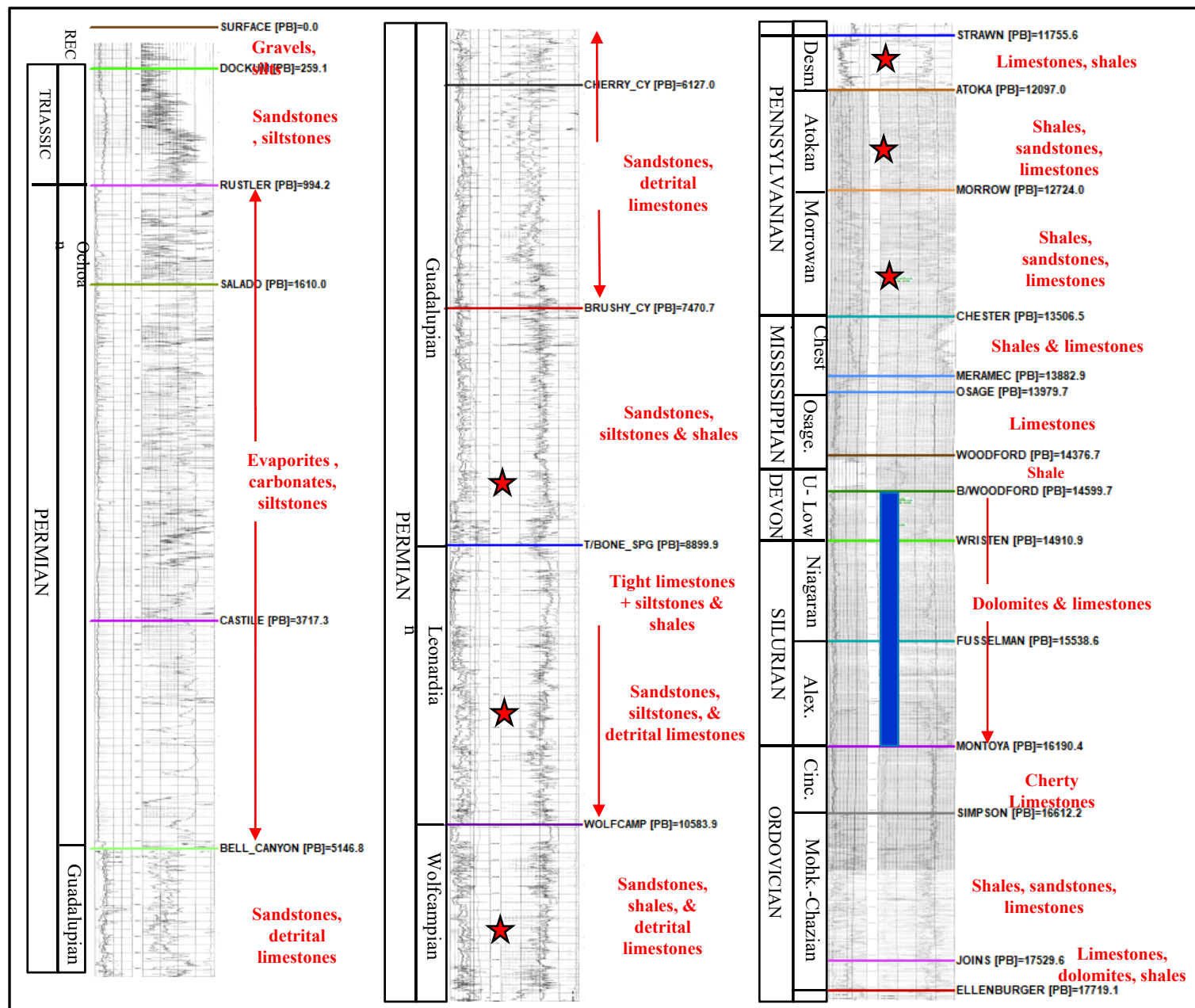


Figure 7: Stratigraphy and Pay Zones Under Proposed AGI#2 Well Site

Map showing the only wells that penetrated below the Woodford shale in the area of the proposed Lucid AGI #2D (circled in red).

Because of the sparsity of deep well control, the map was drawn from extension of the structural trend coming off the cluster of wells to the north-northeast.

These limited number of control wells seem to indicate steep dip to the west-southwest, and there are no doubt faults cutting the section as it comes off the Central Basin Platform margin to the east.

The faults could only be estimated from the irregular spacing of the well control. Cross-section D1-D1' is discussed on the next slides.

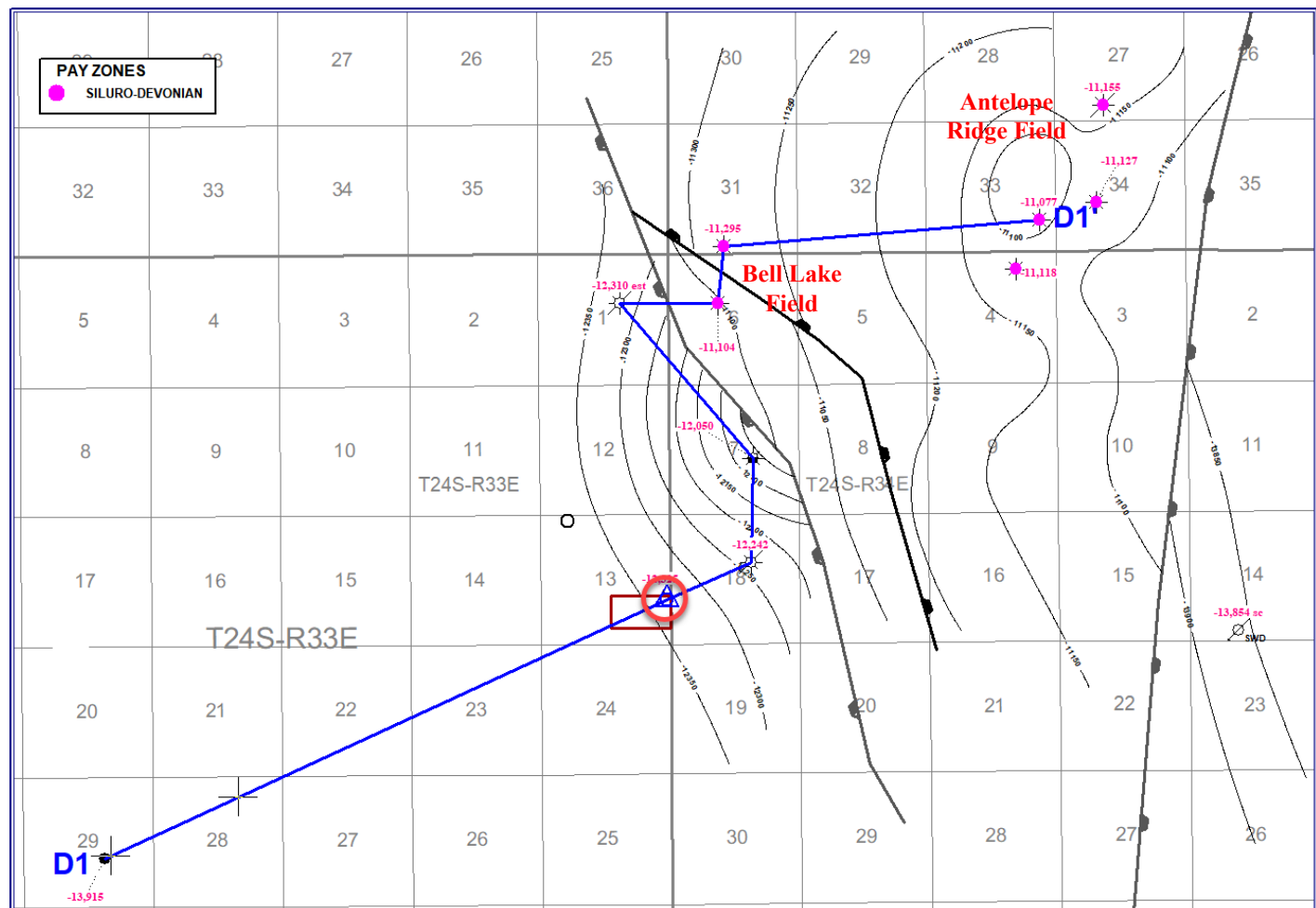
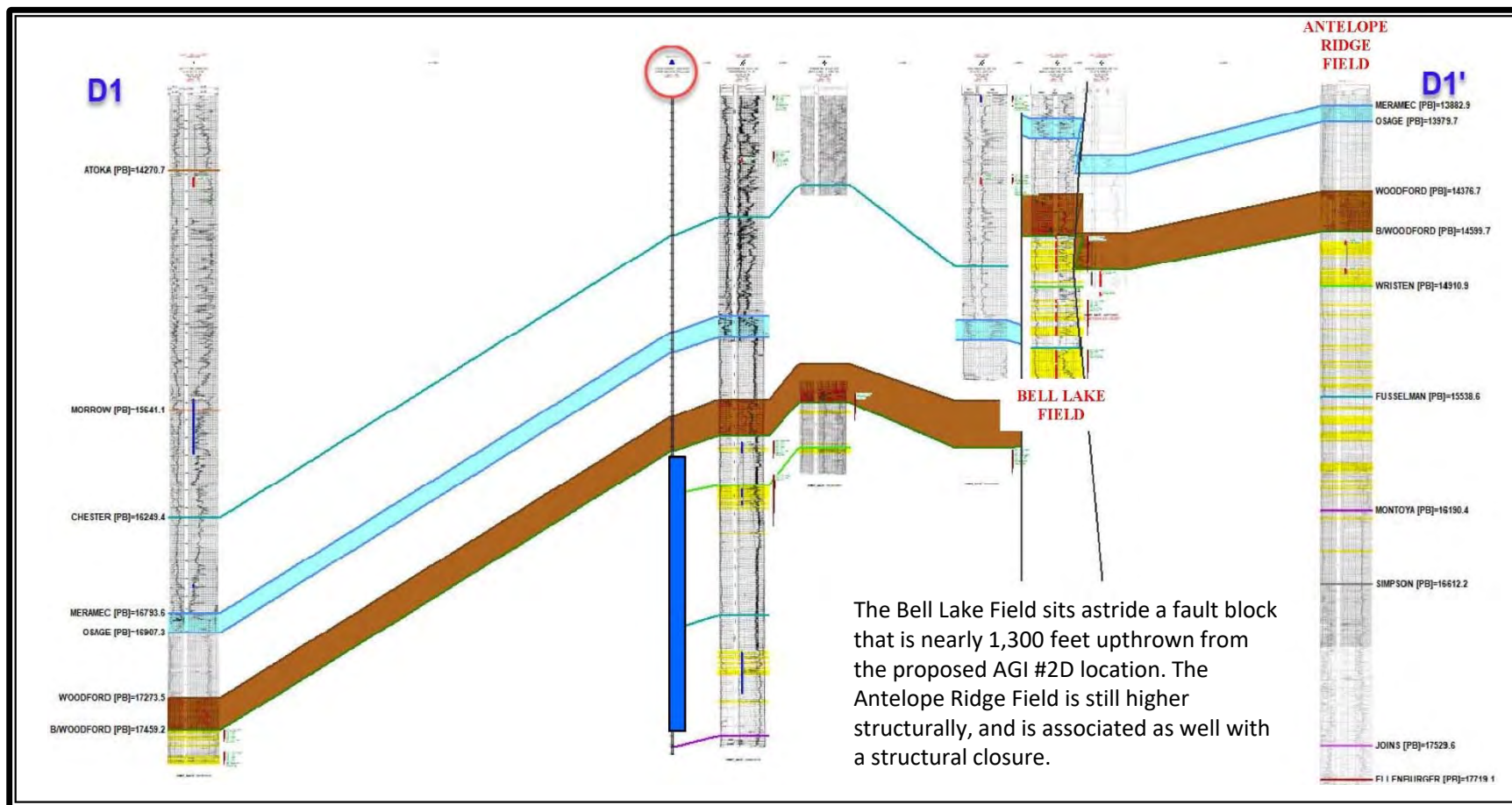


Figure 8: Structure on Top of the Devonian and Location of Cross-Section

(C. I. = 50 Feet)



Yellow shading denotes porosity in the Siluro-Devonian section of 5% or greater, where it could be determined from porosity logs. Porosity is present in thin to thickly-bedded sequences that are separated by tight and/or fractured carbonates. The proposed injection interval (blue bar) would extend to the base of the Fusselman. The Siluro-Devonian interval is approximately 1,200 feet below the closest producing formation (Morrow) in the area, although *there are no active producing Morrow wells within or immediately outside the one-mile radius around the proposed well.*

Figure 9: Structural Cross-Section Through the Deeper Horizons Across the Red Hills Plant Site

Section is hung on base of the Woodford Shale. Yellow shading shows porosity; no shading indicates tight rock. The closest producing zone to the injection target within the area of investigation is over 1,300 feet above in the Morrow. Between the Devonian and Morrow is primarily tight limestones and shales. There are no producing horizons below the Fusselman in this area. The basement is over 1,800 below the base of the proposed injection zone.

The lack of any porosity between the top of the proposed injection zone and the nearest Morrow producing zone demonstrates that there is adequate caprock above the intended injection interval, and there is more than adequate tight rock between the base of the injection interval and the basement.

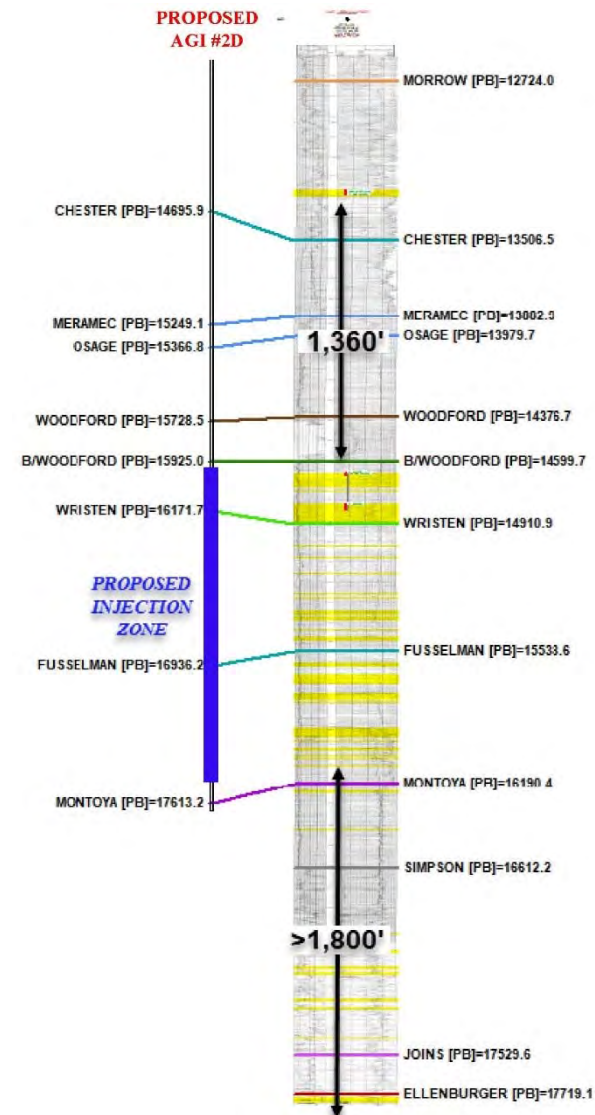


Figure 10: Porosity Profile Above and Below Injection Zone

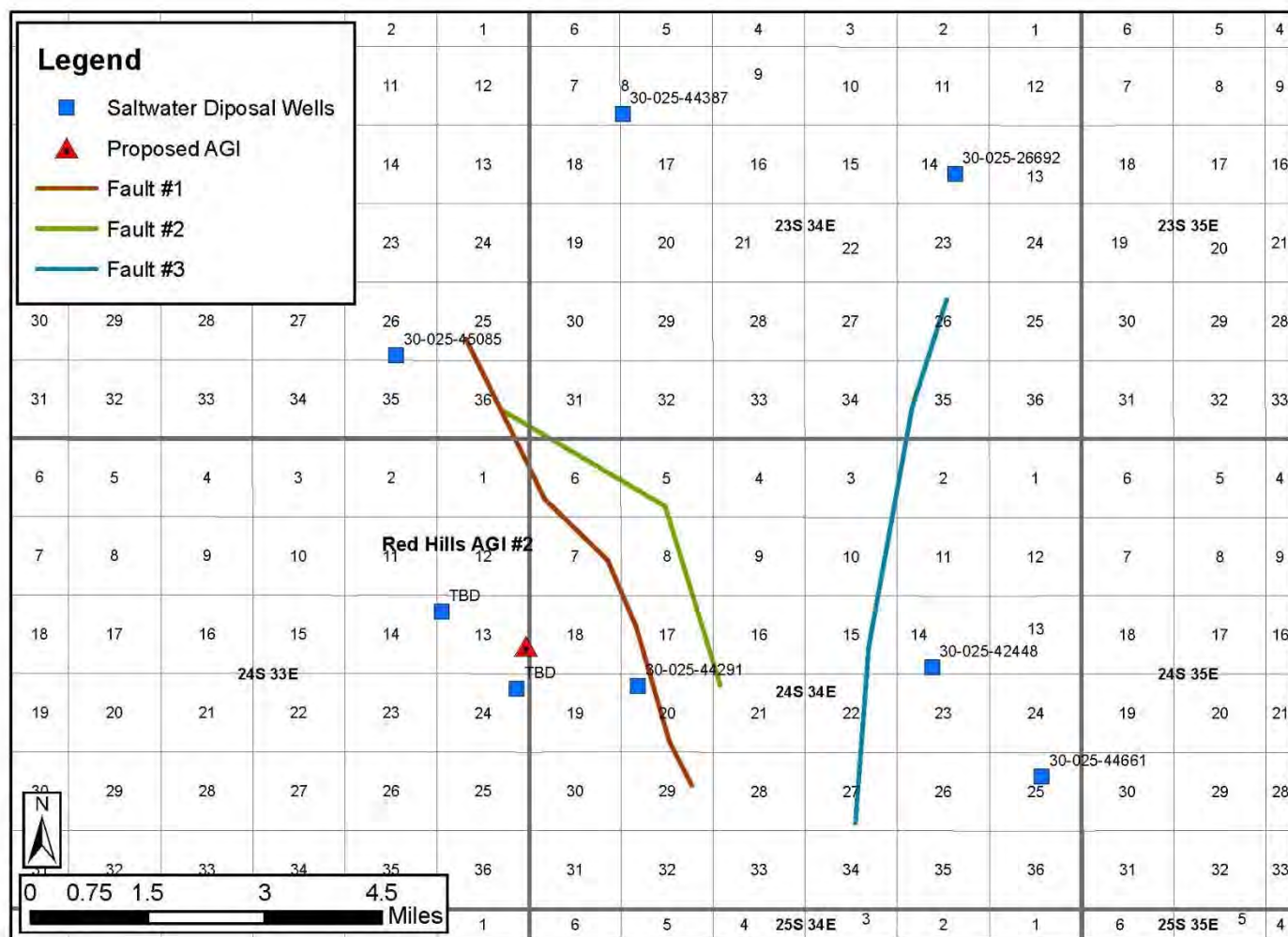
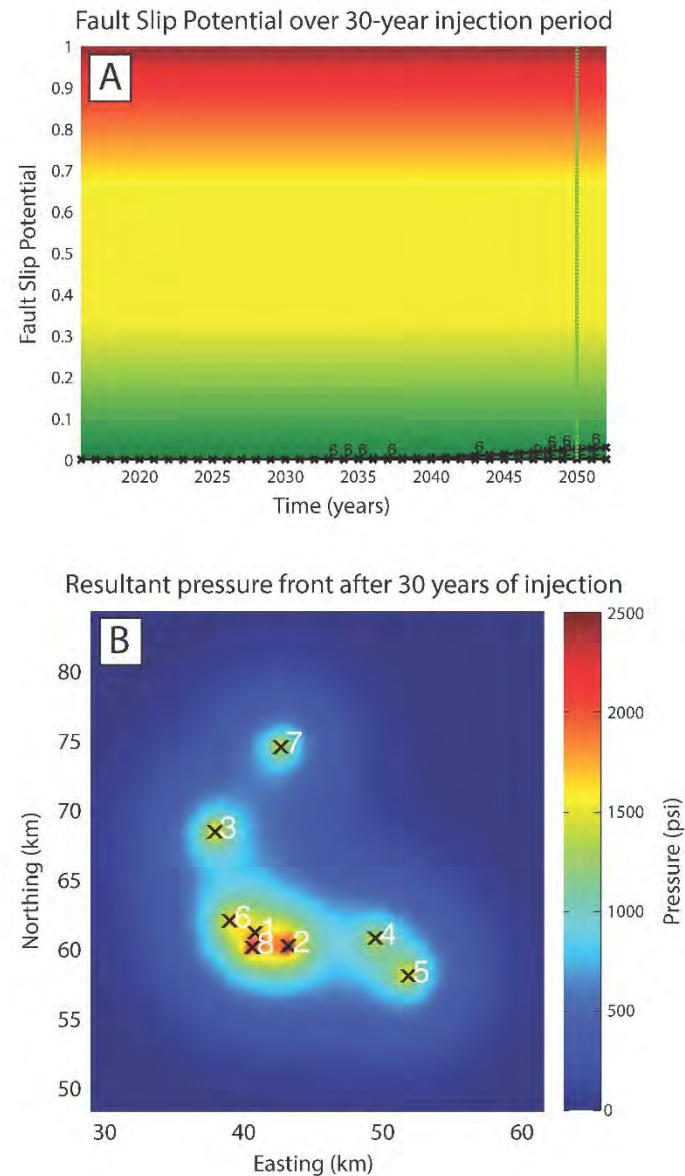


Figure 11: Location Map Showing Saltwater Disposal Wells and Observed Faults within the Area of Proposed Red Hills AGI #2

Figure 12: Model-Predicted Fault Slip Potential over 30 Years (Panel A) and Resultant Pressure Front at Year 2050 (Panel B)



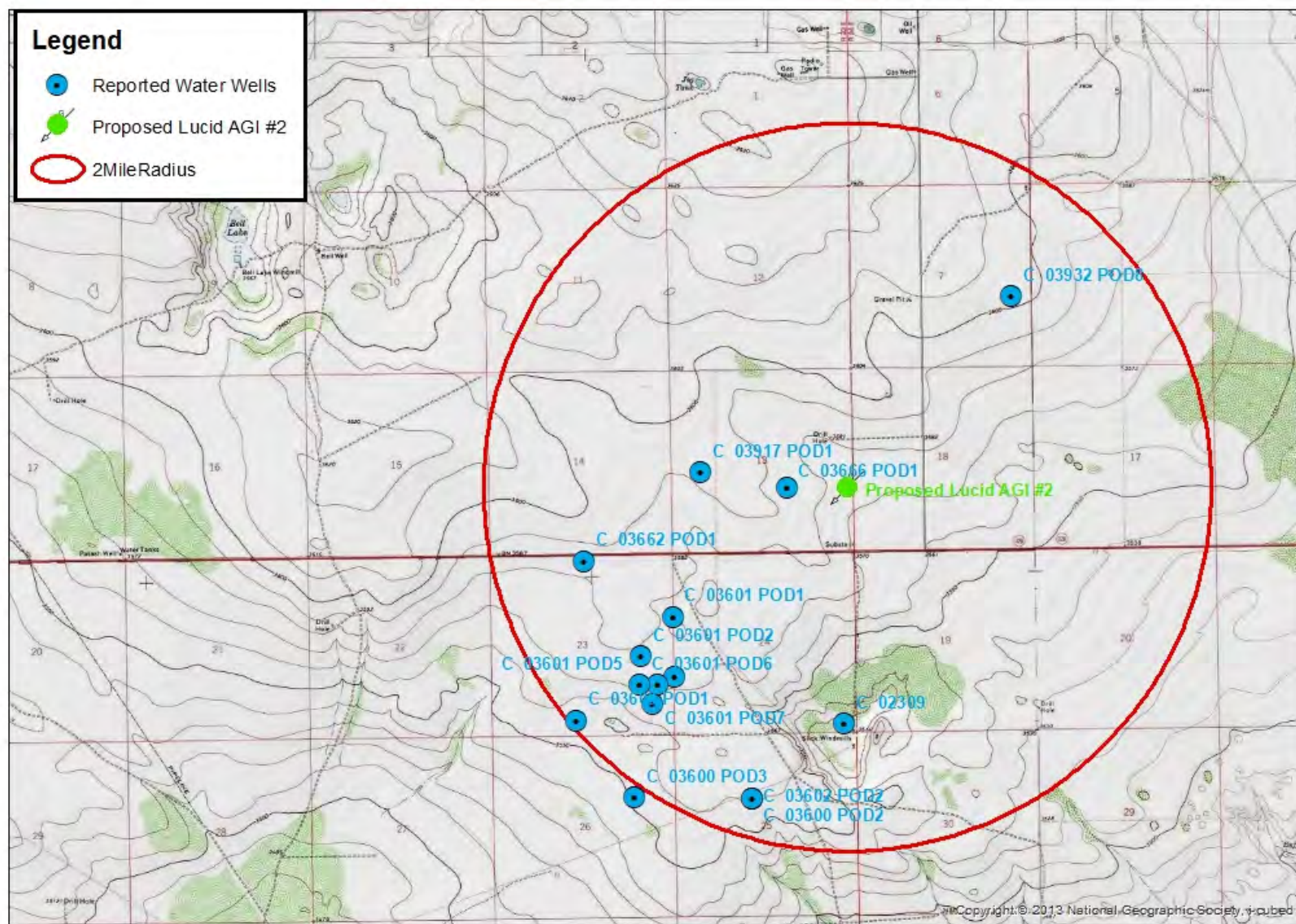


Figure 13: Reported Water Wells within Two Miles of Proposed Lucid AGI #2

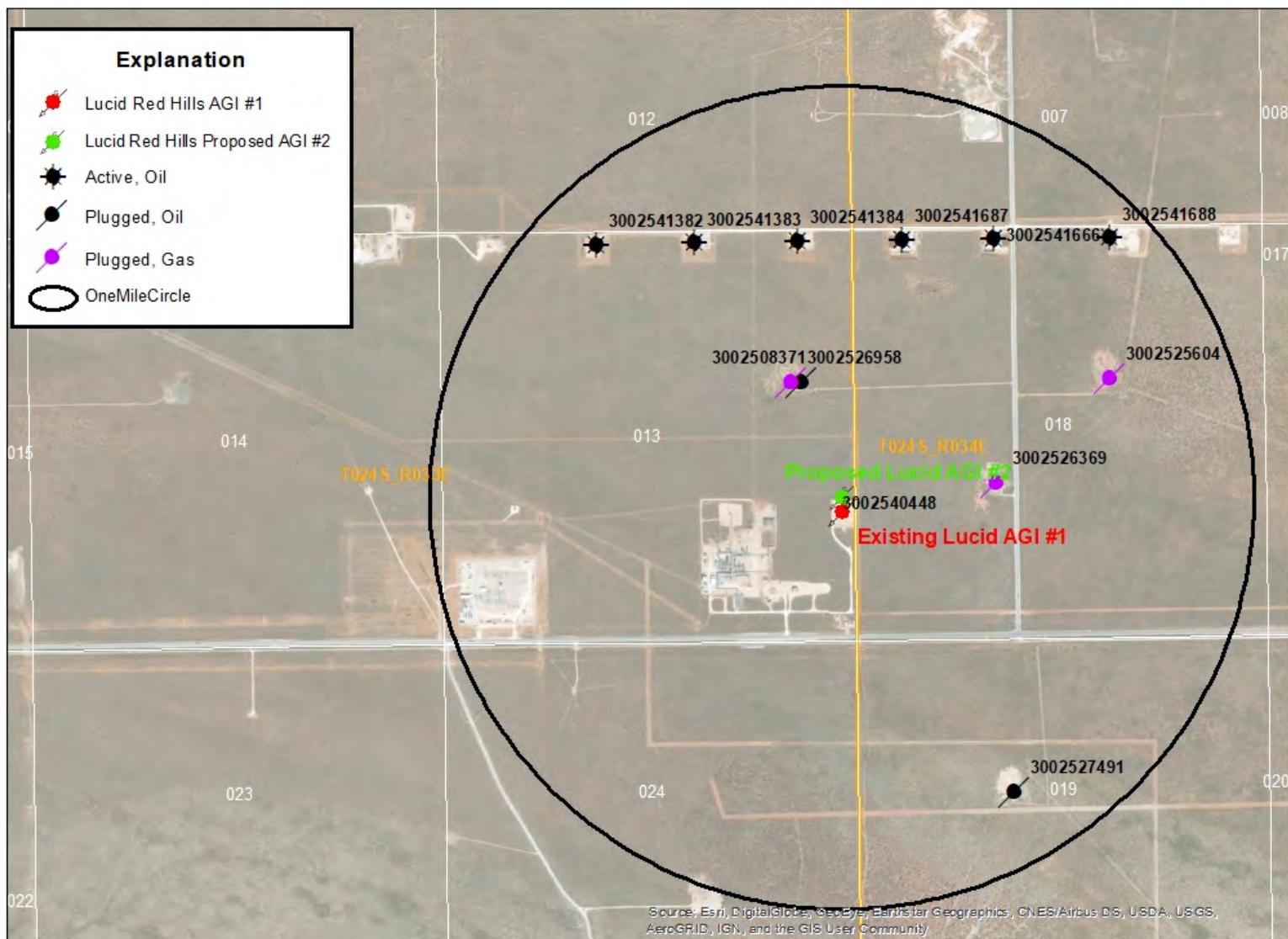


Figure 14: Identified Oil and Gas Wells within One Mile of Proposed Lucid AGI #2

The AGI #2 (arrow) is sited in an area that is within an active Bone Spring and Wolfcamp (Permian) horizontal play.

There are no Devonian producing wells within this map area.

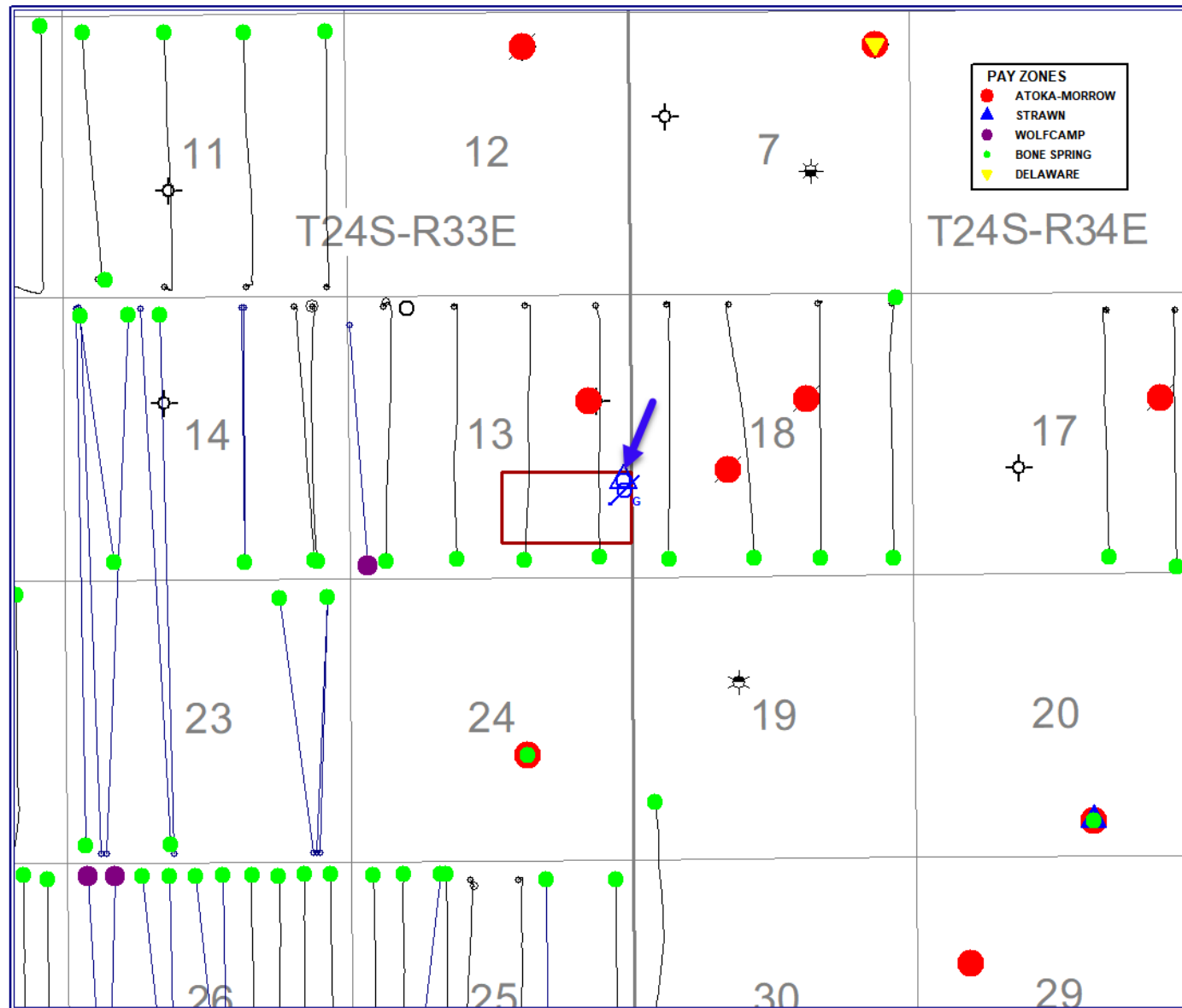


Figure 15: Producing Wells in the Area of Proposed Lucid AGI #2

APPENDIX A

Table A1: List of all Reported Wells within Two Miles of Proposed Lucid AGI #2

**Attachment A: Completion and Plugging Records, EOG Resources Government Com 001,
API #3002525604**

Table A1: List of all Reported Wells within Two Miles of Proposed Lucid AGI #2

API	OPERATOR	WELLNAME	TOWNSHIP	RANGE	SECTION	SPUDDATE	PLUGDATE	TVDDDEPTH	WELLTYPE	COMPLSTAT	DIST(Mi)
3002540448	LUCID ENERGY DELAWARE, LLC	RED HILLS AGI 001	24.05	33E	13	23-Oct-13		6650	I	Active	0.00
3002508371	BYARD BENNETT	J L HOLLAND ETAL 001	24.05	33E	13	24-Feb-61	8-Mar-61	5425	O	Plugged	0.33
3002526958	BOPCO, L.P.	SIMS 001	24.05	33E	13	4/13/1981	26-Dec-07	15007	G	Plugged	0.34
3002526369	EOG RESOURCES INC	GOVERNMENT L COM 002	24.05	34E	18	15-Sep-79	8-Oct-90	14698	G	Plugged	0.38
3002541384	COG OPERATING LLC	DECKARD FEDERAL COM 004H	24.05	33E	13	1-Jun-14		11103	O	Active	0.67
3002541687	COG OPERATING LLC	SEBASTIAN FEDERAL COM 001H	24.05	34E	18	1-Feb-15		10944	O	Active	0.68
3002525604	EOG RESOURCES INC	GOVERNMENT L COM 001	24.05	34E	18	3-Oct-77	30-Dec-04	17625	G	Plugged	0.72
3002541383	COG OPERATING LLC	DECKARD FEDERAL COM 003H	24.05	33E	13	30-Aug-14		11162	O	Active	0.75
3002541666	COG OPERATING LLC	SEBASTIAN FEDERAL COM 002H	24.05	34E	18	24-Feb-15		10927	O	Active	0.76
3002527491	SOUTHLAND ROYALTY CO	SMITH FEDERAL 001	24.05	34E	19	19-Oct-81	10-Aug-86	15120	O	Plugged	0.80
3002541382	COG OPERATING LLC	DECKARD FEDERAL COM 002H	24.05	33E	13	3-Jun-14		11067	O	Active	0.88
3002541688	COG OPERATING LLC	SEBASTIAN FEDERAL COM 003H	24.05	34E	18	3-Aug-14		11055	O	Active	0.93
3002529008	EOG RESOURCES INC	MADERA RIDGE 24 001	24.05	33E	24	7-Nov-84		15600	G	Active	1.00
3002540914	COG OPERATING LLC	DECKARD FEE 001H	24.05	33E	13	15-Mar-13		11034	O	Active	1.07
3002543532	MATADOR PRODUCTION COMPANY	LEO THORSNESS 13 24 33 211H	24.05	33E	13	10-Dec-17		12383	G	Active	1.13
3002541689	COG OPERATING LLC	SEBASTIAN FEDERAL COM 004H	24.05	34E	18	2-Jul-14		10877	O	Active	1.13
3002544442	MATADOR PRODUCTION COMPANY	STRONG 14 24 33 AR 214H	24.05	33E	14	31-Jul-18		12499	G	Active	1.13
3002544918	MATADOR PRODUCTION COMPANY	CARL MOTTEK FEDERAL 211H	24.05	34E	17			0	O	New (Not drilled or compl)	1.24
3002544936	MATADOR PRODUCTION COMPANY	CARL MOTTEK FEDERAL 121H	24.05	34E	17			0	O	New (Not drilled or compl)	1.24
3002544937	MATADOR PRODUCTION COMPANY	CARL MOTTEK FEDERAL 125H	24.05	34E	17			0	O	New (Not drilled or compl)	1.25
3002544291	NGL WATER SOLUTIONS PERMIAN, LLC	STRIKER 6 SWD 002	24.05	34E	20	1/20/2018		17705	S	Active	1.25
3002544917	MATADOR PRODUCTION COMPANY	CARL MOTTEK FEDERAL 101H	24.05	34E	17			0	O	New (Not drilled or compl)	1.25
3002544919	MATADOR PRODUCTION COMPANY	CARL MOTTEK FEDERAL 215H	24.05	34E	17			0	O	New (Not drilled or compl)	1.26
3002541334	COG OPERATING LLC	ROY BATTY FEDERAL COM 004H	24.05	33E	11	26-Dec-13		10899	O	Active	1.27
3002541026	COG OPERATING LLC	TYRELL FEE 001H	24.05	33E	14	24-Apr-13		10951	O	Active	1.28
3002533815	EOG RESOURCES INC	BELL LAKE 7 UNIT 001	24.05	34E	7	12-Jun-97	10-Sep-97	16085	G	Plugged	1.31
3002535504	EOG RESOURCES INC	BELL LAKE UNIT 008	24.05	34E	7	24-Apr-01	13-Jun-01	14500	G	Plugged	1.32
3002542789	COG OPERATING LLC	TYRELL FEE 002H	24.05	33E	14	4-Nov-15		9359	O	Active	1.33
3002543152	KAISER-FRANCIS OIL CO	BELL LAKE UNIT 7 001C	24.05	34E	7			0	G	New (Not drilled or compl)	1.36
3002527052	SUPERIOR OIL CO	GOVERNMENT M 001	24.05	34E	17	14-Dec-80	8-Nov-82	14905	O	Plugged	1.41
3002539716	COG OPERATING LLC	RED RAIDER BKS STATE 002H	24.05	33E	25	1-Apr-10		9455	O	Active	1.42
3002539560	EOG RESOURCES INC	FALCON 25 FEDERAL 001	24.05	33E	25	30-Nov-09		9444	O	Active	1.47
3002542933	DEVON ENERGY PRODUCTION COMPANY, LP	BOOMSLANG 14 23 FEDERAL 004H	24.05	33E	14	5-Jul-17		11274	O	Active	1.49
3002542920	DEVON ENERGY PRODUCTION COMPANY, LP	BOOMSLANG 14 23 FEDERAL 001H	24.05	33E	14	28-Jul-17		9517	O	Active	1.50
3002541333	COG OPERATING LLC	ROY BATTY FEDERAL COM 003H	24.05	33E	11	28-Nov-13		11116	O	Active	1.51
3002526257	KAISER-FRANCIS OIL CO	BELL LAKE UNIT 019	24.05	33E	12	25-Mar-79	12-Jul-11	14760	O	Plugged	1.60
3002534050	EOG RESOURCES INC	LELA MAE STEVENS FEDERAL COM 001	24.05	33E	14	23-Oct-97	13-Mar-02	13840	G	Plugged	1.64
3002543238	DEVON ENERGY PRODUCTION COMPANY, LP	BLUE KRAIT 23 FEDERAL 004H	24.05	33E	23	21-Jun-17		11130	O	Active	1.66
3002543239	DEVON ENERGY PRODUCTION COMPANY, LP	BLUE KRAIT 23 FEDERAL 006H	24.05	33E	23	26-Jun-17		9408	O	Active	1.67
3002543237	DEVON ENERGY PRODUCTION COMPANY, LP	BLUE KRAIT 23 FEDERAL 003H	24.05	33E	23	1-Jul-17		9399	O	Active	1.67
3002541332	COG OPERATING LLC	ROY BATTY FEDERAL COM 002H	24.05	33E	11	1-Nov-13		11101	O	Active	1.77
3002524910	CONOCO INC	BELL LAKE UNIT 5 016	24.05	34E	7	31-Jan-75		14140	G	Active	1.81
3002543308	DEVON ENERGY PRODUCTION COMPANY, LP	BOOMSLANG 14 23 FEDERAL 002H	24.05	33E	14	18-Aug-17		9485	O	Active	1.81
3002541957	CHEVRON MIDCONTINENT, L.P.	PRODIGAL SUN 17 24 34 001H	24.05	34E	17	12-Aug-14		10865	O	Active	1.82
3002534246	DEVON ENERGY PRODUCTION COMPANY, LP	STEVENS 11 001	24.05	33E	11	20-Jan-98	1-Nov-02	15250	G	Plugged	1.92
3002527267	MOBIL PROD TX & NM	GOVERNMENT M 002	24.05	34E	17	28-Mar-81	21-Feb-89	14942	G	Plugged	1.93
3002545296	MATADOR PRODUCTION COMPANY	CHARLES LING FEDERAL COM 134H	24.05	33E	11			0	O	New (Not drilled or compl)	1.98
3002545300	MATADOR PRODUCTION COMPANY	CHARLES LING FEDERAL COM 204H	24.05	33E	11			0	O	New (Not drilled or compl)	1.98
3002545083	MATADOR PRODUCTION COMPANY	CHARLES LING FEDERAL COM 214H	24.05	33E	11			0	O	New (Not drilled or compl)	1.98
3002541099	COG OPERATING LLC	ROY BATTY FEDERAL COM 001F	24.05	33E	11	24-Jun-13		10700	O	Active	1.99

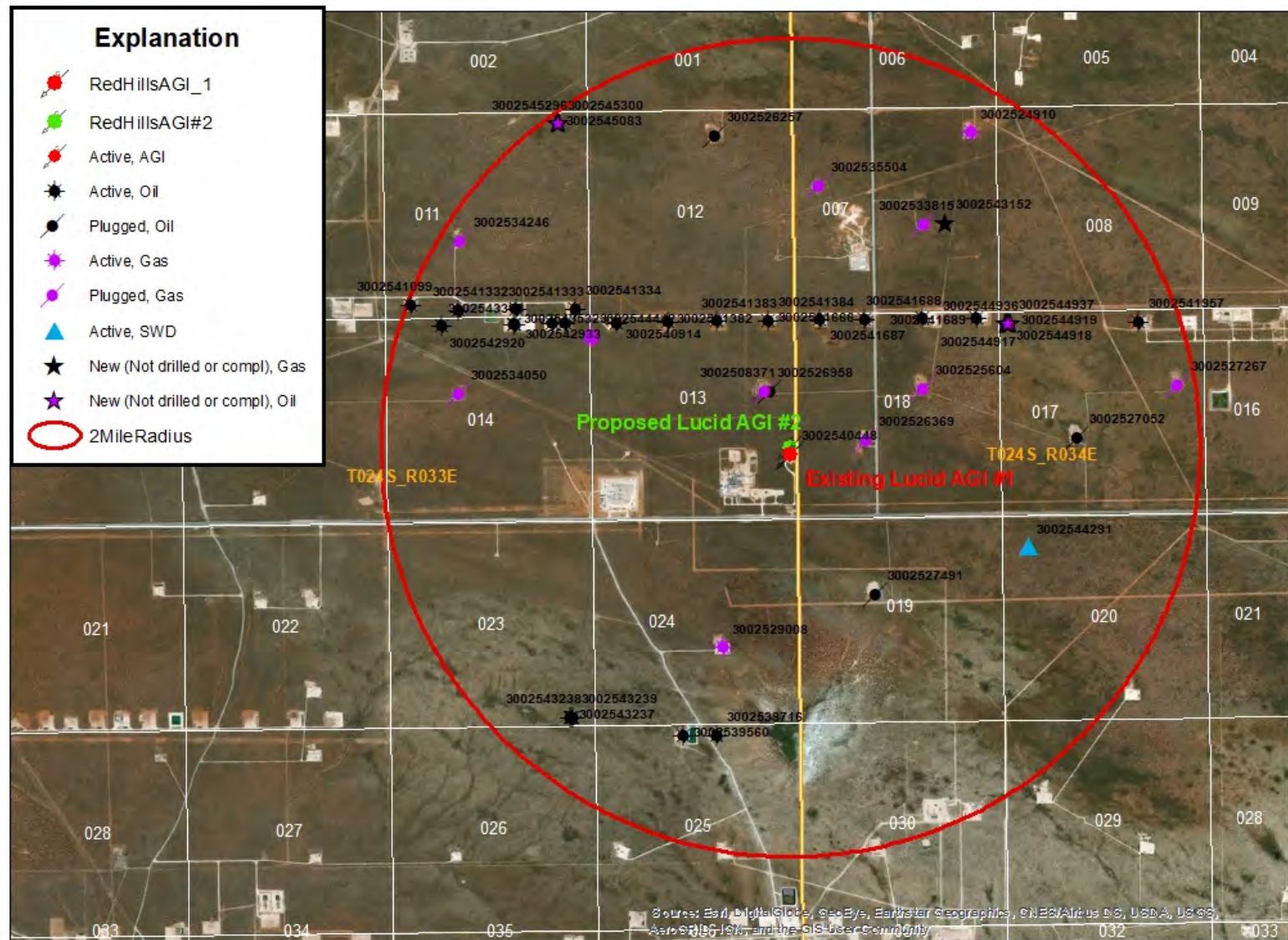


Figure A1: Locations of Reported Wells within Two Miles of Proposed Lucid AGI #2

**Attachment A: Completion and Plugging Records, EOG Resources Government Com 001,
API #3002525604**

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 ☐										7. UNIT AGREEMENT NAME	
b. TYPE OF COMPLETION: NEW WELL ☒ WORK OVER ☐ DEEP-EN ☐ PLUG BACK ☐ DIFF. RESVR. ☐ Other ☐										8. FARM OR LEASE NAME	
2. NAME OF OPERATOR The Superior Oil Company										Government "L" Com.	
3. ADDRESS OF OPERATOR P. O. Box 71, Conroe, Texas 77301										9. WELL NO. 1	
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)* At surface 1980' FEL & 1980' FNL of Section 18 At top prod. interval reported below At total depth										10. FIELD AND POOL OR WILDCAT Undesignated Bell Lake, South R-5781 11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA Sec. 18 - T24S-R34E	
14. PERMIT NO. DATE ISSUED July 11, 1977										12. COUNTY OR PARISH Lea	
										13. STATE New Mexico	
15. DATE SPUDDED 10-3-77		16. DATE T.D. REACHED 3-5-78		17. DATE COMPL. (Ready to prod.) 5-26-78		18. ELEVATIONS (DF, RKB, RT, GR, ETC.) * RKB:3607.5' GL:3576		19. ELEV. CASINGHEAD 3576'			
20. TOTAL DEPTH, MD & TVD 17625		21. PLUG, BACK T.D., MD & TVD 14590		22. IF MULTIPLE COMPL., HOW MANY * - - - -		23. INTERVALS DRILLED BY ROTARY TOOLS 0-17625		CABLE TOOLS -			
21. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD) * Top: 14268' Bottom: 14284' Morrow										25. WAS DIRECTIONAL SURVEY MADE No	
26. TYPE ELECTRIC AND OTHER LOGS RUN CNL-FDC, DLL, DIL, BHC-Sonic, PML										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	
30" OD		118.65		80'		36"		4 cu yds concrete		None	
20" OD		94		600		26"		960 sxs		None	
13-3/8" OD		72,68,61,54.5		5400		17-1/2"		3971 sxs		None	
10-3/4" OD		55.5,60.7		13000		12-1/4"		500 sxs		None	
29. LINER RECORD										30. TUBING RECORD	
SIZE		TOP (MD)		BOTTOM (MD)		SACKS CEMENT*		SCREEN (MD)		SIZE	
7-5/8" OD		12808		15301		825		-		3-1/2"	
5, 23.2#		15092		17624		200		-		13962	
31. PERFORATION RECORD (Interval, size and number) Morrow Sanc: 14268'-14284' w/4 Jets/ft. ID of Holes .43" Total of 64 Holes										32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC. DEPTH INTERVAL (MD) 14268-14284 AMOUNT AND KIND OF MATERIAL USED	
33. PRODUCTION DATE FIRST PRODUCTION 5-26-78 PRODUCTION METHOD (Flowing, gas lift, pumping—size and type of pump) Flowing WELL STATUS (Producing or shut-in) Shut-in											
DATE OF TEST 5-29-78		HOURS TESTED 1-1/2		CHOKE SIZE 24/64		PROD'N. FOR TEST PERIOD →		OIL—BBL. -		GAS—MCF. 4500	
FLOW TUBING PRESS. 1900		CASING PRESSURE 0-Pkr		CALCULATED 24-HOUR RATE →		OIL—BBL. -		GAS—MCF. 4500		WATER—BBL. 0	
34. DISPOSITION OF GAS (Sold, used for fuel, vented, etc.) Vented while flowing to clean up										TEST WITNESSED BY A. B. Taylor	
35. LIST OF ATTACHMENTS Logs											
36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records											
SIGNED <u>Dillut J. Kei</u> TITLE Senior Engineering Assistant DATE June 27, 1978											

STORM CHOKE

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

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Loc

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 13: 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) and bottom(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.	28. GEOLOGIC MARKERS	
				NAME	TOP MEAS. DEPTH TRUE VERT. DEPTH
Red Beds, Sd	0	604	FOR TEST INFORMATION SEE ATTACHMENT	Bone Springs	10676
Red Beds, Anhy	604	1235		Strawn	13010
Salt, Anhy	1235	3682		Atoka	13210
Anhy, Lm	3682	3815		Morrow	13961
Anhy, Salt, Lm	3815	4765		Miss. Lime	15183
Lm, Sd	4765	5400		Devonian	15853
Lm, Sh, Sd	5400	6615		Fusselman	17088
SS, Sh	6615	7386			
Sh, Lm, Sd	7386	8955			
Sh, Lm, Chert	8955	9980			
Sh, Lm, Sd	9980	10240			
Sh, Lm	10240	13204			
Lm	13204	13279			
Sh, Lm, Sd	13279	14346			
Sh	14346	14653			
Sd, Sh, Lm	14653	14734			
Sh, Lm	14734	15192			
Lm	15192	15615			
Dolo	15615	15900			
Lm, Dolo	15900	16290			
Dolo	16290	17080			
Lm, Dolo	17080	17200			
Dolo	17200	17625			

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

New Mexico Oil Conservation Division, District I
1625 N. French Drive
Hobbs, NM 88240

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

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE- Other instructions on reverse side.

1. Type of Well ☐ Oil Well ☒ Gas Well ☐ Other		5. Lease Serial No. NM-17446
2. Name of Operator EOG Resources, Inc		6. If Indian, Allottee or Tribe Name
3a. Address P.O. Box 2267, Midland, TX, 79702	3b. Phone No. (include area code) 432-561-8600	7. If Unit or CA/Agreement, Name and/or No.
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Unit Letter G, 1980 FNL, 1980 FEL Section 18, Township 24-S, Range 34-E		8. Well Name and No. Government "L" Com #1
		9. API Well No. 30-025-05010-25604
		10. Field and Pool, or Exploratory Area Bell Lake, South Morrow
		11. County or Parish, State Lea, New Mexico

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

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☐ Other
	☐ Change Plans	☒ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

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

1. Notify BLM 24 hrs prior to MI and RU.
2. Stuck tbg at 11500, pkr at 13940, cut tbg at 11500, set 7 5/8 CIBP at 11500, spot 35sx, plug from 11500-11400 (TOF, Morrow) WOC Tag.
3. Perf 4 holes at 9050, sqz 75sx, plug from 9050-8950 (B. Springs) WOC Tag.
4. Perf 4 holes at 7000, sqz 75sx, plug from 7000-6900 (Interval).
5. Cut 10 3/4 csg at 5450, L/D csg. Spot 150sx, plug from 5450-5350 (13 3/8 Shoe) WOC Tag.
6. Spot 75sx, plug from 1300-1200 (T-Salt) WOC Tag.
7. Spot 150sx, plug from 650-450 (20" Shoe) WOC Tag.
8. Spot 20sx, plug from 10-Surf (Surf).
9. Install dry hole marker.

ACCEPTED FOR RECORD

DEC 14 2004

GARY GOURLEY
PETROLEUM ENGINEER

14. I hereby certify that the foregoing is true and correct
Name (Printed/Typed)

Jimmy Bagley

Title

Consultant

Signature

Jimmy Bagley

Date

12/09/2004

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

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

Title

Date

Office

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

(Instructions on page 2)

GW W

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE- Other instructions on reverse side.

1. Type of Well
☐ Oil Well ☒ Gas Well ☐ Other

2. Name of Operator
EOG Resources, Inc

3a. Address
P.O. Box 2267, Midland, TX, 79702

3b. Phone No. (include area code)
432-561-8600

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Unit Letter G, 1980 FNL, 1980 FEL
Section 18, Township 24-S, Range 34-E

5. Lease Serial No.
NM-17446

6. If Indian, Allottee or Tribe Name

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

8. Well Name and No.
Government "L" Com #1

9. API Well No.
30-025-0870-2560X

10. Field and Pool, or Exploratory Area
Bell Lake, South Morrow

11. County or Parish, State
Lea, New Mexico

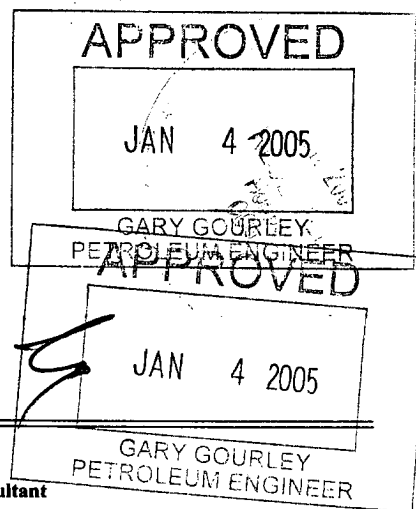
12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION				
☐ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off	
☒ Subsequent Report	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity	
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☐ Other	
	☐ Change Plans	☒ Plug and Abandon	☐ Temporarily Abandon		
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal		

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

1. Notified Jim McCormick w/BLM 24 hrs prior to MI and RU.
2. Cut 3 1/2' tbg at 11500, spot 50sx CLASS "H" cmt, plug from 11500-11400, WOC Tag at 11389.
3. Circ hole w/MLF.
4. Perf 4 holes at 9050, press up to 2000 PSI, spot 75sx, plug from 9100-8950, WOC Tag @ 8938.
5. Perf 4 holes at 7000, press up to 2000 PSI, spot 75sx, plug from 7050-6900, WOC Tag at 6855.
6. Cut 10 3/4" csg at 5450, L/D csg, spot 150sx, plug from 5500-5350, WOC Tag at 5336.
7. Spot 75sx, plug from 1300-1200 (T-Salt) WOC Tag at 1143.
8. Spot 150sx, plug from 650-450 (20" Shoe) WOC Tag at 423.
9. Spot 20sx, plug from 30-Surf.
10. Clean location. Install dry hole marker 12-30-04.

P&A Complete 12-30-04



14. I hereby certify that the foregoing is true and correct
Name (Printed/Typed)

Jimmy Bagley

Title

Consultant

Signature

Date

12/30/2004

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

Title

Date

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

Office

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

(Instructions on page 2)

GWW

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD-HOBBS

FORM APPROVED
OMB No 1004-0135
Expires: January 31, 2004

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

MAY 8 1 2012

Lease Serial No.
NM-174466 If Indian, Allottee or Tribe Name
N/A

SUBMIT IN TRIPLICATE- Other instructions on reverse side.

1. Type of Well
☐ Oil Well ☐ ☒ Gas Well ☐ Other2. Name of Operator
Agave Energy Company3a Address
105 S. Fourth Street, Artesia, NM 882103b Phone No. (include area code)
575-748-4528

4. Location of Well (Footage, Sec, T, R, M., or Survey Description)

Unit Letter G, 1980 FNL, 1980 FEL Sec. 18, T 24 S, R 34 E, NMPM, Lea Co. NM

7. If Unit or CA/Agreement, Name and/or No.
NM 720018. Well Name and No.
Government "L" Com #19. API Well No.
300252560410. Field and Pool, or Exploratory Area
Bell Lake, South Morrow11. County or Parish, State
Lea, NM

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

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Fracture Treat	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other re plug to cement off
	☐ Change Plans	☒ Plug and Abandon	☐ Temporarily Abandon	cherry canyon per
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	NMOCC R-13507

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

The Cherry Canyon lies between 6,150 and 6,450' in this well. BLM and NMOCD files show that the 10.25" casing was set in a 13,000' 12.25" borehole, and cemented with 500 sacks of cement. Calculated volumes indicate that the top of cement (TOC) would only reach to depths of 10,900' (1.0 cubic ft per sack) to 9,900' (1.5 cubic ft per sack). In any case, the Cherry Canyon interval may be un-cemented in the 12.25" bore. During plugging operations, the 10.25" casing was cut and removed at 5,540', leaving the 13.375" surface casing in place from surface to 5,400'. The 10.25" casing still remains adjacent to the Cherry Canyon (see attached well diagram). Proposed replugging includes:

1. Find the location, construct access and excavate the well head, and construct a temporary cellar
2. Move in and rig up a workover rig, open the 13.375" casing and nipple up an appropriate BOP
3. Drill out existing cement plugs at surface, 450', 1,200', and 5,356' and hole cavings to 5540' (top of remaining 10.25" casing)
4. Reenter 10.25" casing at 5540' and clean the hole to approximately 6,900'
5. Find best squeeze location below base of Cherry Canyon based on existing logs
6. Set a CIBP at 6,550' (100 feet below Cherry Canyon)
7. At the squeeze location perforate two feet using 4spf foot, 90 degrees apart
8. Set a cement retainer at approximately 6,050' and squeeze the Cherry Canyon using approximately 250 sacks of cement
9. Wait on cement for 6 hours, and pressure test at 500 psi for 30 minutes
10. Replace former cement plugs to plug well based on current BLM guidelines or requirements
11. Remove BOP, weld top plate, and reclaim site to original status

RECLAMATION PROCEDURE
ATTACHEDSEE ATTACHED FOR
CONDITIONS OF APPROVAL

See Pg. 3 & changes

14. I hereby certify that the foregoing is true and correct
Name (Printed/Typed)

Alberto A. Gutierrez, RG

Title Consultant to Agave Energy Company

Signature

Date 04/05/2012

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

Title

SEAS

Date

5-29-12

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

Office

CFO

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

(Instructions on page 2)

MAY 31 2012

Proposed Re-Plugging Program

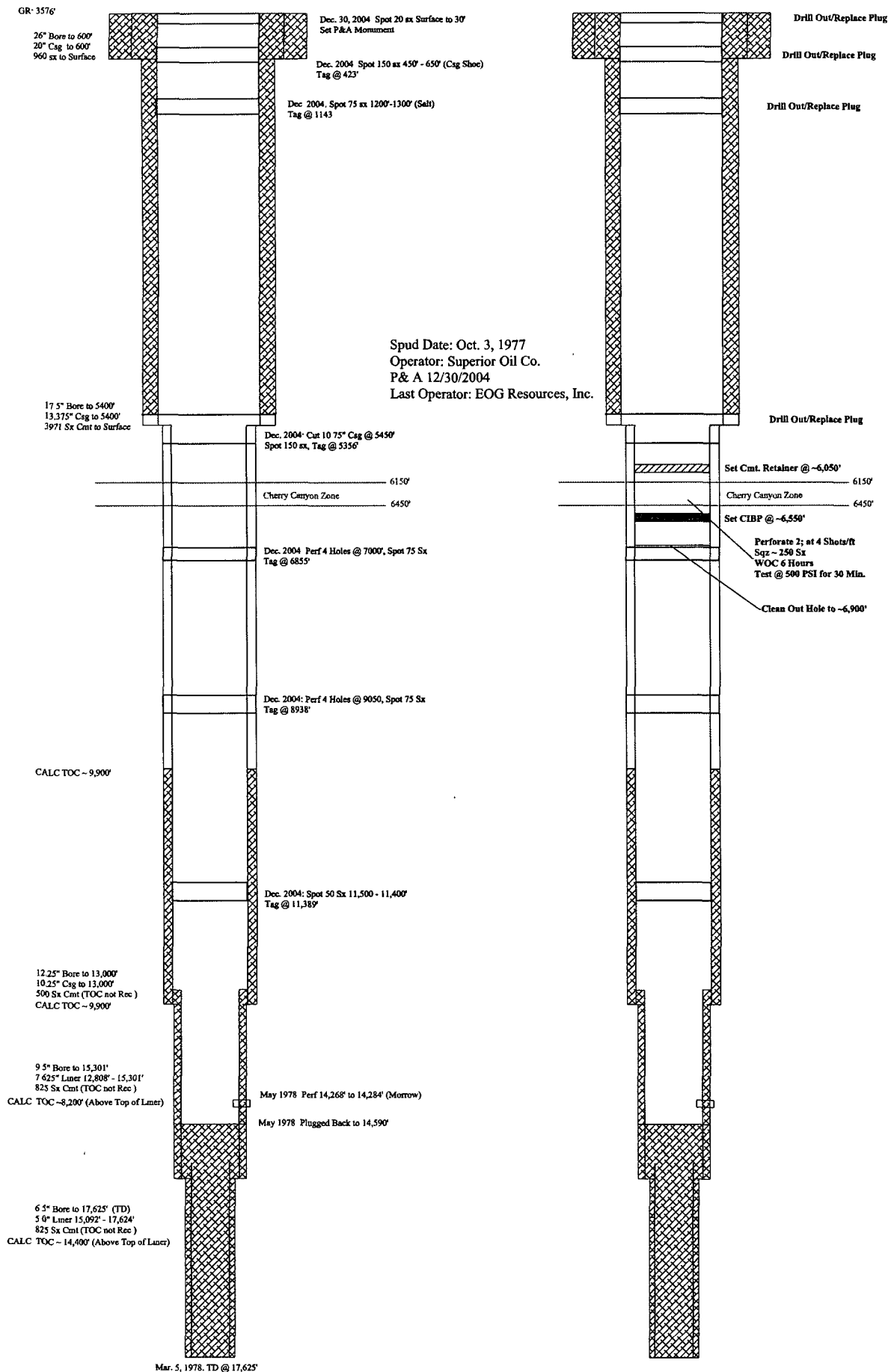


Figure 4: Proposed Plugging Program for Government "L" Com #1

APPENDIX B

Table B1: Operators within One Mile of Proposed Lucid AGI #2

Table B2: Leased Areas Without Operators within One Mile of Proposed Lucid AGI #2

Table B3: Surface Owners within One Mile of Proposed Lucid AGI #2

Table B4: Summary of Land Data from Elkhorn Land & Title, LLC

Attachment B1: Example Notice Letter

Attachment B2: Draft Hearing Publication Notice

Table B1: Operators within One Mile of Proposed Lucid AGI #2

COG Operating, LLC
600 West Illinois Avenue
Midland, Texas 79701
(432) 683-7443

Devon Energy Production Company, LP,
333 W. Sheridan Ave.,
Oklahoma City, OK 73102

EOG Resources, Inc.
5509 Champions Drive
Midland, TX 79706
(432) 686- 3689

Kaiser-Francis Oil Company
6733 Yale Avenue
Tulsa, OK 74136
(918) 491-4685

Lucid Energy Delaware, LLC
3100 McKinnon Street, Suite 800
Dallas, TX 75201
(214) 420-4949

Matador Production Company
5400 LBJ Freeway, Suite 1500
Dallas, TX 75240
(972) 371-5200

WPX Energy Permian, LLC
3500 One Williams Center
Tulsa, OK 74172
(405) 996-5760

Table B2: Leased Areas Without Operators within One Mile of Proposed Lucid AGI #2

Legal Description: Lots 1-3, E2NW4, N2NE4, SW4NE4, NE4SW4, Sec. 19-T24S-R34E, N.M.P.M, Lea Co., NM

Federal Lease No.: NMNM 17241

Posting Date: 4/03/2019 (County); 3/18/2019 (Federal)

Operator (as per the

<https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/Wells.aspx>)

None

All Depths

Working Interests Owners:

EOG Resources, Inc.

5509 Champions Drive

Midland, TX 79706

(432) 686- 3689

Legal Description: SE4, SE4SW4, Sec. 12-T24S-R33E, N.M.P.M., Lea Co., NM

Federal Lease No.: NMLC 63798

Posting Date: 3/18/2019 (County); 3/19/2019 (Federal)

Operator: None Listed

All Depths

Working Interests Owners:

WPX Energy Permian, LLC

3500 One Williams Center

Tulsa, OK 74172

(405) 996-5760

Kaiser-Francis Oil Company

6733 Yale Avenue

Tulsa, OK 74136

(918) 491-4685

Strangers in Title:

Ard Oil, Ltd.

P.O. Box 101027

Ft. Worth, TX 76185

(817) 882-9377

Legal Description: Lots 1-3, E2NW4, N2NE4, SW4NE4, NE4SW4, Sec. 19-T24S-R34E, N.M.P.M, Lea Co., NM

Federal Lease No.: NMNM 17241

Posting Date: 4/03/2019 (County); 3/18/2019 (Federal)

Operator (as per the

<https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/Wells.aspx>)

None

All Depths

Working Interests Owners:

EOG Resources, Inc.

5509 Champions Drive

Midland, TX 79706

(432) 686- 3689

Legal Description: N2NW4, SE4NW4, Sec. 24-T24S-R33E, N.M.P.M., Lea Co., NM

Federal Lease No.: NMLC 63798

Posting Date: 3/20/2019 (County); 3/19/2019 (Federal)

All Depths

Working Interests Owners:

EOG Resources, Inc.

5509 Champions Drive

Midland, TX 79706

(432) 561-5082

Table B3: Surface Owners within One Mile of Proposed Lucid AGI #2

Quail Ranch LLC
One Concho Center
600 West Illinois Avenue
Midland, TX 79701
(432) 520-2517

United States of America
Bureau of Land Management
P.O. Box 27115
Santa Fe, NM 87502-0115
(505) 954-2000

Merry Ann Byrd
P.O. Box 562
Buffalo Gap, TX 79508
(325) 572-3593

Sharon Smith
842 Comanche Trail
Abilene, TX 79601
(940) 395-0654

Shirley Ann Roach
818 South San Jose Drive
Abilene, TX 79605
(325) 692-8058

John Michael Scott
6501 East Ridge Road, # J-6
Odessa, TX 79762
(817) 483-2687

Diane Amelia Scott Hunsaker
17619 Strathern Street
Northridge, CA 91325
(818) 782-4086

Billie McKandles Fortner
1033 Park Center Street
Benbrook, TX 76126
(817) 249-2080

Linda Jean Butler Duralia
814 West 25th Street
Odessa, TX 79763
(432) 272-0928

Maedell Annette Butler Davidson
814 West 25th Street
Odessa, TX 79763
(432) 272-0928

Marissa Lynette Butler
2200 Katy Lane, Apartment D
Georgetown, TX 78626
No phone number found

James Erick Butler
323 Sage Trail
Springtown, TX 76082
No phone number found

Cloma Perkins Garrett
c/o Jo Anne Krall
1110 Selman Court
San Angelo, TX 76905
(325) 703-1004
(325) 703-4317

Jerry Wayne Mize
207 Willey Street
Willard, MO 65781
No phone number found

June Cook
c/o Jo Anne Krall
1110 Selman Court
San Angelo, TX 76905
(325) 703-1004
(325) 703-4317

Jo Anne Krall
1110 Selman Court
San Angelo, TX 76905
(325) 703-1004
(325) 703-4317

Mary Nell McKandles Hale
1033 Park Center Street
Benbrook, TX 76126
(817) 249-2080

New Mexico Department of Transportation
P.O. Box 1149
Santa Fe, NM 87504
(505) 795-1401

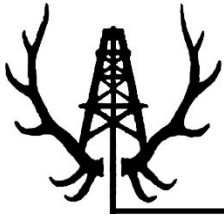
NGL Water Solutions Permian, LLC
6120 South Yale Avenue, Suite 605
Tulsa, OK 74136
(918) 481-1119

Southwestern Public Service Company
P.O. Box 1979
Denver, CO 80201
(800) 895-1999

Agave Energy Company
c/o Lucid Artesia Company
1900 Dalrock Road
Rowlett, TX 75088
(469) 298-1594

Vanguard Wireless, LLC
c/o InSite Wireless Group, LLC
1199 North Fairfax Street, Suite 700
Alexandria, VA 22314
(705) 535-3009

Table B4: Summary of Land Data from Elkhorn Land & Title, LLC



ELKHORN LAND & TITLE, LLC

400 N. Pennsylvania Ave., Suite 1220
P.O. Box 38
Roswell, New Mexico 88202

Office: (575) 627-3477

www.elkhornlandandtitle.com

Fax: (866) 912-8990

NAMES LIST

Legal Description: SE4, SE4SW4, Sec. 12-T24S-R33E, N.M.P.M., Lea Co., NM

Federal Lease No.: NMLC 63798

Posting Date: 3/18/2019 (County); 3/19/2019 (Federal)

Surface Owner:

Quail Ranch LLC
One Concho Center
600 West Illinois Avenue
Midland, TX 79701
(432) 520-2517

All Depths

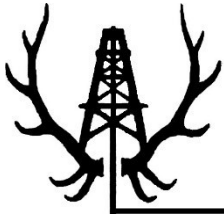
Working Interests Owners:

WPX Energy Permian, LLC
3500 One Williams Center
Tulsa, OK 74172
(405) 996-5760

Kaiser-Francis Oil Company
6733 Yale Avenue
Tulsa, OK 74136
(918) 491-4685

Strangers in Title:

Ard Oil, Ltd.
P.O. Box 101027
Ft. Worth, TX 76185
(817) 882-9377



ELKHORN LAND & TITLE, LLC

400 N. Pennsylvania Ave., Suite 1220
P.O. Box 38
Roswell, New Mexico 88202

Office: (575) 627-3477

www.elkhornlandandtitle.com

Fax: (866) 912-8990

NAMES LIST

Legal Description: N2NW4, SE4NW4, Sec. 24-T24S-R33E, N.M.P.M., Lea Co., NM

Federal Lease No.: NMLC 63798

Posting Date: 3/20/2019 (County); 3/19/2019 (Federal)

All Depths

Working Interests Owners:

EOG Resources, Inc.
5509 Champions Drive
Midland, TX 79706
(432) 561-5082

Surface Owners:

Quail Ranch LLC
One Concho Center
600 West Illinois Avenue
Midland, TX 79701
(432) 520-2517

Vanguard Wireless, LLC
c/o InSite Wireless Group, LLC
1199 North Fairfax Street, Suite 700
Alexandria, VA22314
(705) 535-3009

U.S.A.
c/o New Mexico BLM
301 Dinosaur Trail
Santa Fe, NM 87508
(505) 954-2000



American Abstract
P.O. Box 23510
Santa Fe, NM 87502
(505) 780-4338

Township: 24 S. Range: 34 E. N.M.P.M.
County: Lea
Date: March 18, 2019

MASTER PLAT

A 6x6 grid with numbers 1-36 and a 3x3 sub-grid with numbers 1-9.

	6				
	7				
	18				
1	1	1	1		
2	1	1	1		
3	1	1			
	30				
	31				
	32				
	33				
	34				
	35				
	36				

1. NMNM 17241

[illegible]



1. Updated: 03/18/2019

Township: 24 S. Range: 34 E. Section: 19 County: Lea

Lease: NMNM 17241 Lease Issued: 01/01/1973 Royalty Rate: 12-1/2%

Status: This Lease is Held by Production

Lessee(s):

100% EOG Resources, Inc., P.O. Box 4362, Houston, TX 77210

Operating Rights:

Section 19-Lots 1-3,E2NW,SWNE,NESW, all depths
100% Lessee

Overriding Royalty:

1.43750%	Annette Shoemaker, a/k/a Annette L. Shoemaker, 1271 E. Longwood Drive, Bull Valley, IL 60098
1.00000%	Santa Elena Minerals IV, LP, P.O. Box 2063, Midland, TX 79702
0.81250%	Escondido Oil and Gas, LLC, P.O. Box 51390, Midland, TX 79710
0.25001%	Trican Exploration, 408 Gihls Tower West, Midland, TX 79701
0.08333%	Boley Embrey, Summit Bldg., 300 N. Marienfeld, Ste. 204, Midland, TX 79701
0.08333%	Shanee Oil Company, Inc., 424 Bldg. of the Southwest, Midland, TX 79701
0.02083%	Craig A. Bales, Two First City Center, Ste. 1300, Midland, TX 79701
0.06250%	Bob L. Bales, Two First City Center, Ste. 1300, Midland, TX 79701
0.84375%	M.K. Tettleton, 444 Delaine, Corpus Christi, TX 78411
0.06250%	Kenneth H. Griffin, 130 Spring Park Drive, Ste. 200, Midland, TX 79705
0.06250%	Gary G. Burnett, 130 Spring Park Drive, Ste. 200, Midland, TX 79705
0.28125%	H.L. Brinson, Ind. Executor of the Estate of Boyd Laughlin, P.O. Box 5027, Midland, TX 79704



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Township: 24 S. Range: 33 E. N.M.P.M.
County: Lea
Date: March 19, 2019

MASTER PLAT

A 6x6 grid with numbers 1-36 and a large number 1 in the top right. The grid is composed of 36 small squares. The numbers 1 through 36 are placed in the center of each square, arranged in a standard 6x6 grid pattern. A large number 1 is placed in the top right corner of the grid, spanning the top two rows and the right two columns. The numbers 1 through 36 are arranged as follows: Row 1: 6, 5, 4, 3, 2, 1. Row 2: 7, 8, 9, 10, 11, 12. Row 3: 18, 17, 16, 15, 14, 13. Row 4: 19, 20, 21, 22, 23, 24. Row 5: 30, 29, 28, 27, 26, 25. Row 6: 31, 32, 33, 34, 35, 36. A large number 1 is placed in the top right corner, spanning the top two rows and the right two columns.

1. NMLC 063798

[illegible]



Updated: 03/19/2019

Township: 24 S. **Range:** 33 E. **Section:** 12,24 **County:** Lea

Lease: NMLC 063798 **Lease Issued:** 02/01/1951 **Royalty Rate:** 12-1/2%

Status: This Lease is Held by Production

Lessee(s):

100% Devon Energy Production Company, LP, 333 W. Sheridan Ave., Oklahoma City, OK 73102

Operating Rights:

Section 12-SE,SESW, all depths

50% RKI Exploration & Production LLC, 3500 One Williams Ctr., Tulsa, OK 74172

50% Kaiser-Francis Oil Company, 6733 Yale Avenue, Tulsa, OK 74136

Section 24-N2NW,SENW, all depths

100% EOG Resources, Inc., 5509 Champions Drive, Midland, TX 79706

Overriding Royalty:

Section 12-SE,SESW

1.5% O.H. Randel & Clarice Randel, his wife, Fort Worth, TX

1.5% R.S. Magruder & Helen Magruder, a widow, 601 Sinclair Bldg., Fort Worth, TX

¼ of 1% Edward M. Muse, 301 Magnolia, Fort Worth, TX

¼ of 1% John C. Thomas, P.O. Box 6881, San Antonio, TX 78209

4.71875% Panther City Investment Company, no address shown

0.09375% Sid R. Bass, Fort Wort, TX

0.09375% Edward R. Bass, Fort Worth, TX

0.09375% Robert M. Bass, Fort Worth, TX

Section 24-N2NW,SENW

1.5% O.H. Randel & Clarice Randel, his wife, Fort Worth, TX

1.5% R.S. Magruder & Helen Magruder, a widow, 601 Sinclair Bldg., Fort Worth, TX

¼ of 1% Edward M. Muse, 301 Magnolia, Fort Worth, TX

¼ of 1% John C. Thomas, P.O. Box 6881, San Antonio, TX 78209

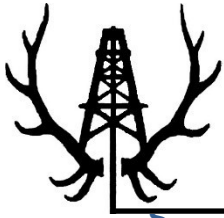
1.25% Panther City Investment Company, no address shown

1.25% Sid R. Bass, Fort Wort, TX

1.25% Edward R. Bass, Fort Worth, TX

1.25% Robert M. Bass, Fort Worth, TX

The difference between existing burdens and 18.75% of 8/8ths- Devon Energy Production Company, LP, 333 W. Sheridan Ave., Oklahoma City, OK 73102, as to Section 24-N2NW,SENW



ELKHORN LAND & TITLE, LLC

400 N. Pennsylvania Ave., Suite 1220

P.O. Box 38

Roswell, New Mexico 88202

Office: (575) 627-3477

www.elkhornlandandtitle.com

Fax: (866) 912-8990

NAMES LIST

Legal Description: All, Sec. 18-T24SR34E; All, Sec. 13-T24S-R33E; E2SE4, SE4NE4, Sec. 14-T24S-R33E, N.M.P.M., Lea Co., NM

Posting Date: 4/03/2019 (County)

Operators as per the <https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/Wells.aspx>

Lucid Energy Delaware, LLC
3100 McKinnon Street, Suite 800
Dallas, TX 75201
(214) 420-4949

COG Operating, LLC
600 West Illinois Avenue
Midland, TX 79701
(432) 683-7443

Matador Production Company
5400 LBJ Freeway, Suite 1500
Dallas, TX 75240
(972) 371-5200

Surface Title Owners:

Quail Ranch, LLC
600 West Illinois Avenue
Midland, TX 79701
(432) 520-2517

Merry Ann Byrd
P.O. Box 562
Buffalo Gap, TX 79508
(325) 572-3593

Sharon Smith
842 Comanche Trail
Abilene, TX 79601
(940) 395-0654

Shirley Ann Roach
818 South San Jose Drive
Abilene, TX 79605
(325) 692-8058

John Michael Scott
6501 East Ridge Road, # J-6
Odessa, TX 79762
(817) 483-2687

Diane Amelia Scott Hunsaker
17619 Strathern Street
Northridge, CA 91325
(818) 782-4086

Billie McKandles Fortner
1033 Park Center Street
Benbrook, TX 76126
(817) 249-2080

Linda Jean Butler Duralia
814 West 25th Street
Odessa, TX 79763
(432) 272-0928

Maedell Annette Butler Davidson
814 West 25th Street
Odessa, TX 79763
(432) 272-0928

Marissa Lynette Butler
2200 Katy Lane, Apartment D
Georgetown, TX 78626
No phone number found

James Erick Butler
323 Sage Trail
Springtown, TX 76082
No phone number found

Cloma Perkins Garrett
c/o Jo Anne Krall
1110 Selman Court
San Angelo, TX 76905
(325) 703-1004
(325) 703-4317

Jerry Wayne Mize
207 Willey Street
Willard, MO 65781
No phone number found

June Cook
c/o Jo Anne Krall
1110 Selman Court
San Angelo, TX 76905
(325) 703-1004
(325) 703-4317

Jo Anne Krall
1110 Selman Court
San Angelo, TX 76905
(325) 703-1004
(325) 703-4317

Mary Nell McKandles Hale
1033 Park Center Street
Benbrook, TX 76126
(817) 249-2080

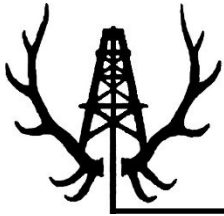
New Mexico Department of Transportation
P.O. Box 1149
Santa Fe, NM 87504
(505) 795-1401

NGL Water Solutions Permian, LLC
6120 South Yale Avenue, Suite 605
Tulsa, OK 74136
(918) 481-1119

Southwestern Public Service Company
P.O. Box 1979
Denver, CO 80201
(800) 895-1999

Agave Energy Company
c/o Lucid Artesia Company
1900 Dalrock Road
Rowlett, TX 75088
(469) 298-1594

U.S.A.
c/o New Mexico BLM
301 Dinosaur Trail
Santa Fe, NM 87508
(505) 954-2000



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Fax: (866) 912-8990

NAMES LIST

Legal Description: Lot 1, NE4, NE4NW4, Sec. 18-T24S-R34E, N.M.P.M., Lea Co., NM

Federal Lease No.: NMNM 123528 (Only as to the S2NE4)

Posting Date: 4/03/2019 at 5:00 p.m. (County)

Operator (as per the <https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/Wells.aspx>)

COG Operating, LLC
600 West Illinois Avenue
Midland, Texas 79701
(432) 683-7443

N2N2

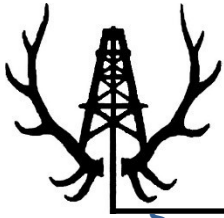
Surface Owners:

Quail Ranch, LLC
600 West Illinois Avenue
Midland, Texas 79701
(432) 683-7443

S2NE4

Surface Owners:

United States of America
Bureau of Land Management
P.O. Box 27115
Santa Fe, NM 87502-0115
(505) 954-2000



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400 N. Pennsylvania Ave., Suite 1220

P.O. Box 38

Roswell, New Mexico 88202

Office: (575) 627-3477

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Fax: (866) 912-8990

NAMES LIST

Legal Description: Lots 1-3, E2NW4, N2NE4, SW4NE4, NE4SW4, Sec. 19-T24S-R34E, N.M.P.M, Lea Co., NM

Federal Lease No.: NMNM 17241

Posting Date: 4/03/2019 (County); 3/18/2019 (Federal)

Operator (as per the <https://wwwapps.emnrd.state.nm.us/ocd/ocdpermitting/Data/Wells.aspx>)

None

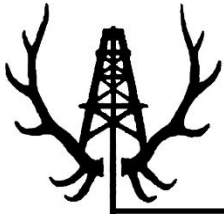
All Depths

Working Interests Owners:

EOG Resources, Inc.
5509 Champions Drive
Midland, TX 79706
(432) 686- 3689

Surface Title Owner:

Quail Ranch, LLC
600 West Illinois Avenue
Midland, TX 79701



ELKHORN LAND & TITLE, LLC

400 N. Pennsylvania Ave., Suite 1220

P.O. Box 38

Roswell, New Mexico 88202

Office: (575) 627-3477

www.elkhornlandandtitle.com

Fax: (866) 912-8990

NAMES LIST

Legal Description: NE4, N2SE4, Sec. 24-T24S-R33E, N.M.P.M., Lea Co., NM

Posting Date: 4/17/2019 (Lea County)

Operator:

EOG Resources, Inc
P.O. Box 4362
Houston, TX 77210
(713) 651-6995

All Depths

Working Interests Owners:

EOG Resources, Inc
P.O. Box 4362
Houston, TX 77210
(713) 651-6995

ExxonMobil
5959 Las Colinas Boulevard
Irving, TX 75039
(972) 940-6000

Robert E. Landreth
110 West Louisiana Avenue
Suite 404
Midland, TX 79701
(432) 684-4781

Unleased Mineral Owners:

Rubert Madera
P.O. Box 2795
Ruidoso, NM 88355
(575) 395-2912

Fortis Minerals II, LLC
1111 Bagby Street
Suite 2150
Houston, TX 77002
(844) 936-7847

Surface Owner:

Quail Ranch, LLC
550 West Texas Avenue
Suite 100
Midland, TX 79701
(432) 683-7443

Attachment B1: Example Notice Letter

June 5, 2019

Example notice letter

Party to be notified

Address

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED

RE: CASE NUMBER XXXX: LUCID ENERGY DELAWARE, LLC PROPOSED RED HILLS AGI#2

This letter is to advise you that Lucid Energy Delaware LLC (Lucid) filed the enclosed C-108 application on June 5, 2019, with the New Mexico Oil Conservation Commission seeking authorization to drill an Acid Gas Injection (AGI) well at their Red Hills Gas Plant (the "Plant") in Lea County, New Mexico. AGI #2 will be a vertical well, located at 1800' FSL, 150' FEL in Section 13, T24S, R33E, NMPM, Lea County, New Mexico. Lucid plans to inject up to 13 million standard cubic feet per day (MMSCFD) of treated acid gas from the Plant at a maximum pressure of 4,838 psig into the Devonian and Upper Silurian Wristen and Fusselman Formations, approximately 16,000 to 17,600 feet below the surface. The proposed wells will serve as a disposal well for acid gas at this plant.

This application (Case Number XXXX) has been set for hearing before the New Mexico Oil Conservation Commission at 9:00 AM on Thursday, XXXXX, 2019, in Wendell Chino Building at the New Mexico Oil Conservation Division's Santa Fe office located at 1220 South Saint Francis Drive, Santa Fe, New Mexico 87505. You are not required to attend this hearing, but as an owner of an interest that may be affected by Lucid's application, you may appear and present testimony. Failure to appear at that time and become a party of record will preclude you from challenging the application at a later date.

A party appearing at the hearing is required by Division Rule 19.15.4.13 NMAC to file a Pre-Hearing Statement at least four days in advance of a scheduled hearing, but in no event not later than 5:00 p.m. Mountain Time on the Thursday preceding the scheduled hearing date. This statement must be filed at the Division's Santa Fe office at the above-specified address and should include the names of the parties and their attorneys; a concise statement of the case; the names of all witnesses the party will call to testify at the hearing; the approximate time the party will need to present its case; and an identification of any procedural matters that need to be resolved prior to the hearing.

If you have any questions concerning this application, or to obtain an entire copy of the C-108, you may contact Mr. Alberto Gutierrez or Mr. James C. Hunter 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 Lucid Energy Delaware LLC
Enclosure: C-108 Application for Authority to Inject

Attachment B2: Draft Hearing Publication Notice

Case No.XXXXX: Application of Lucid Energy Delaware, LLC for authority to inject, Lea

County, New Mexico. Lucid Energy Delaware, LLC (Lucid) requests an order from the New Mexico Oil Conservation Commission (NMOCC) authorizing it to inject acid gas and carbon dioxide (CO₂) from the Lucid Gas Processing Plant (the “Plant”) into its proposed AGI#2 well.

This well will be located on Lucid’s operating Plant in Lea County, New Mexico. The proposed AGI well will be located in Section 13, Township 24 South, Range 33 East, NMPM, Lea

County, New Mexico. Lucid plans to inject up to 13 million standard cubic feet per day

(MMSCFD) of treated acid gas from the Plant at a maximum pressure of 4,838 psig into this well

in the Devonian through Fusselman Formations, approximately 16,000 to 17,600 feet below the

surface. The proposed well will serve as a disposal well for acid gas and CO₂ from the Plant.

This application has been set for hearing before the New Mexico Oil Conservation Commission at 9:00

AM on YYYYYY, 2019, in Porter Hall at the New Mexico Oil Conservation Division’s Santa Fe office

located at 1220 South Saint Francis Drive, Santa Fe, New Mexico 87505.