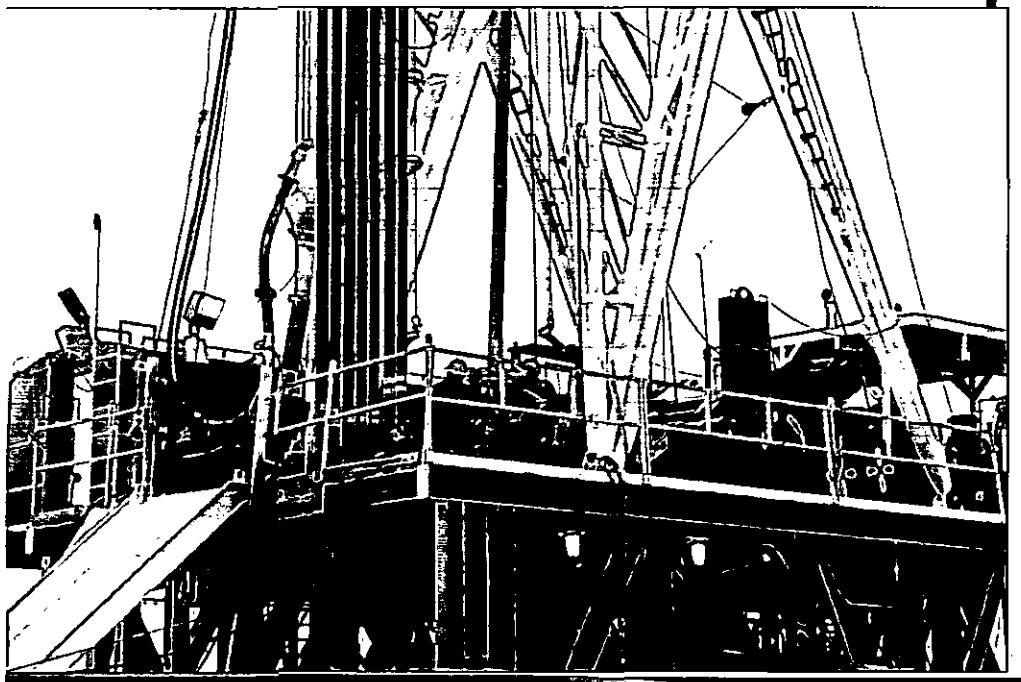
DCP Midstream LP

Artesia Gas Processing Plant AGI System
Application for Authorization to Inject
C-108 Application for Artesia AGI#2



Presented in a Hearing Before the
New Mexico Oil Conservation Commission
Case 15127

June 19, 2014
Santa Fe, New Mexico

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BEFORE THE OIL CONVERSATION COMMISSION
Santa Fe, New Mexico
Exhibit No. 2
Submitted by: DCP MIDSTREAM LP
Hearing Date: June 19, 2014

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DCP Midstream's Witnesses

- Russ Ortega – **DCP Midstream LP**
- Alberto A. Gutierrez, RG – **Geolex, Inc.**

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Presentation Topics for Each Witness

- Describe overall history and environmental benefits of DCP's Proposed Artesia AGI #2 well --- **Russ Ortega**

- Describe relevant site geology and hydrogeology, system design, operation, analyses of anticipated effect on injection zone and all components of C-108 application. --- **Alberto A. Gutiérrez, RG**

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Artesia Gas Plant Overview

- Recent upgrades and improvements to plant to enhance reliability and operational efficiencies.
- Produces approximately 2MMCFD of TAG which is approximately 30% H_2S and 70% CO_2
- Produces approximately 600 bpd average wastewater currently disposed of in SWD on plant.
- Employs approximately 25 full-time employees and provides gas processing for approximately 120 producers.
- AGI#1 operated successfully since 2002 with good temperature and pressure control.

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Goals of AGI#2 Project

- Enhance operational reliability by providing another AGI well with enhanced corrosion protection and redundancy.
- Allow for simultaneous or alternate operation to provide greater reliability, operational flexibility and reservoir lifespan.
- Reduces need for prolonged shutdown for unscheduled well maintenance or repairs.
- Provides uninterrupted service to producers and royalty stream flowing while protecting correlative rights and reducing waste.

DCP's Artesia AGI Project Timeline

- Increasing gas production in the Permian Basin has increased the demand for gas plant capacity in this area to support production.
- The existing AGI well (3001532324), in use for 12 years, has performed well; however, due to the reliance of many producers on the 24/7 operation of the plant, DCP seeks a permit for a new well to help in reliability and reduce chance of having to shut in producers in the event of well workover or other issue.
- The new well will be located at the Artesia plant. TAG lines to compressors and the wells will be connected directly from the sweetening units.
- The well will be drilled as a deviated well and completed consistent with a carefully developed AGI well design and in compliance with NMOCD guidelines and recent NMOCC approved AGIs.
- Geolex was retained in June 2013 to evaluate the potential for a redundant AGI, and prepared the application for injection submitted on March 24, 2014.

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Outline of Presentation

- Rationale and Timeline for the Artesia AGI #2 Project
- Summary of Key Aspects of Proposed AGI Well
- Key Elements of C-108 and Geologic Analysis
- Detailed Geologic Analysis of Injection Area and Reservoir
- Key Design Features of AGI System and Wells
- Summary of Geologic and Engineering Factors Protecting Production and Ground Water
- Conclusions and Summary of DCP's Request for NMOCC Order

Key Elements of DCP's C-108

- The AGI #2 is intended to provide the primary TAG injection and allow for the AGI #1 to be used as a redundant back-up well; however, DCP may operate both wells simultaneously splitting flow between them.
- The redundancy capability will allow DCP to avoid most shutdowns.
- Nearby oil and gas wells, nearby water wells and surface water are protected by well design and geologic factors.
- Detailed log interpretation has permitted the accurate delineation of the reservoir assuring that nearby wells will be protected.

Key Elements of DCP's C-108 (cont.)

- DCP's C-108 application details the full information needed to approve the installation of the second AGI well.
- A revised H_2S Contingency Plan for the Artesia plant will be submitted to NMOCD including the new well for approval prior to commencing injection.
- Operators and surface owners have received proper notice.

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C-108 Application Executive Summary

- DCP is requesting authority to inject acid gas with or without wastewater from a second, deviated well.
  - Used as the primary AGI well for the Artesia plant, while maintaining the existing AGI as a backup
  - Into the Lower San Andres, Glorieta and Upper Yeso Formations of the Delaware Basin at depths of approximately 3,600 to 4,300 feet
  - The well is designed for a TAG rate of 2.0 MMSCFD, and/or average of 600 barrels per day of wastewater
  - The maximum operating surface pressure will range from 1,704 psig (TAG only) to 916 psig (wastewater only).
- At the estimated average TAG injection rate of 2.0 MMSCFD, the radius of influence is calculated to be 0.25 miles after 30 years.
- Using a safety factor of 100% for the TAG and actual average volume for wastewater (4.0 MMSCFD TAG and 600 barrels per day of wastewater), the radius in influence for the new proposed well was calculated to have a 30-year radius of 0.4 miles.
- There is no current or anticipated production in the injection zone within one mile of the proposed injection site .
- Only three wells penetrate the injection zone within the one mile radius area of review (the existing DCP Midstream Artesia well and two other SWD wells). Within one-half mile of the proposed well there are no wells penetrating the injection zone (except the DCP SWD).
- All wells penetrating the proposed injection zone are properly completed; effectively isolating the proposed injection zones.
- The DCP SWD will be properly plugged and abandoned prior to putting the new well into service.
- The proposed injection zone is capable of permanently containing the injected fluid due to low porosity and permeability of cap rock above and below zone.

Location and Background

- The proposed AGI well is designed to support the operations of DCP's Artesia Gas Plant.
- The new well will be constructed in Section 7, Township 18 South, Range 28 East in Eddy County, New Mexico (see location map on Figure 1).
- This well will serve as the primary injection well, allowing the AGI #1, operating at the site since 2002, to become the redundant well.

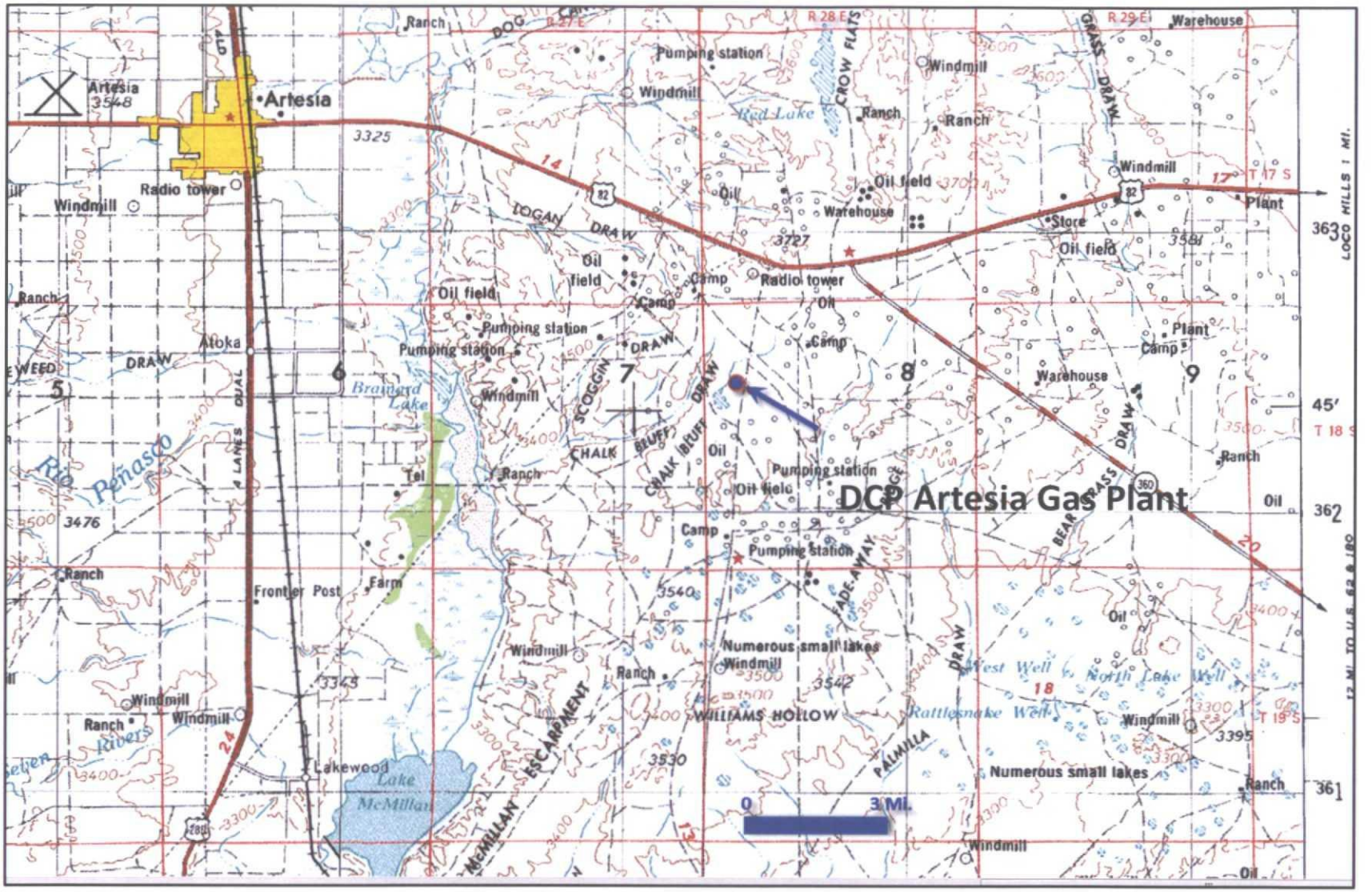

Figure 1: Location of DCP Artesia Gas Plant and Duke AGI #1 well (blue arrow), Eddy County, New Mexico.

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Legal Description of Proposed Well

- The existing Duke Energy AGI #1 well was drilled at 1,232' from the south line (FSL) and 1,927 feet from the east line (FEL) of Section 7.
- The new DCP Midstream AGI #2 well will be drilled at 1,180 FSL and 2,035 FEL of Section 7.
- Well AGI #2 will be deviated approximately 42° to the southeast of the surface location to reach the bottom hole approximately 1,500 feet southeast of the surface location, placing the injection zone location at 690 FSL and 745 FEL in Section 7.
- The wellhead of AGI #2 is situated approximately 120 feet southwest of the existing AGI #1, to facilitate connections with the existing compressor facilities.
- Locations of the wells and surface facilities are shown in Figure 2.

Figure 2: Location of Proposed AGI #2

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Injection Fluid Volume, Composition and Pressure Calculations

- Maximum anticipated TAG-only injection rate for system is 2.0 MMSCFD.
- Combined TAG and wastewater injection rate is 2.0 MMSCFD of TAG and an average of 600 barrels per day of wastewater.
- Injected fluid composition is approximately 30% H_2S, 70% CO_2, and traces of light hydrocarbons (C1 – C8).
- Injected fluid compatibility is determined through nearby injection experience and formation fluid analysis.
- The Maximum Allowable Operating Pressure (MAOP) requested was calculated per NMOCD guidelines to be 1,704 psig (TAG only) to 916 psig (wastewater only).

Reservoir Volume and Area Calculations

- At the anticipated reservoir conditions of 104° F and 1,600 psi, each million standard cubic feet per day (MMSCFD) of TAG will occupy a volume of 2,753 cubic feet (490 barrels).
- At the anticipated maximum operational capacity of 2 MMSCFD, the compressed TAG will occupy 981 barrels per day.
- After 30 years of operation, the calculated TAG injection fluid plume will occupy:
  - Wastewater only, averaging 600 bbls/day:
    - **74 Acres, radius of 0.19 miles**
  - TAG only, 2.0 MMSCFD:
    - **121 Acres, radius of 0.25 miles**
  - TAG at 2.0 MMSCFD plus wastewater averaging 600 bbls/day :
    - **195 Acres, radius of 0.31 miles**
  - TAG only plus 100% safety factor, 4.0 MMSCFD:
    - **246 Acres, radius of 0.35 miles**
  - TAG at 100% safety factor 4.0 MMSCFD plus wastewater averaging 600 bbls/day :
    - **317 acres, radius of 0.4 miles**
- Areas of these radii are shown in Figures 3a and 3b.

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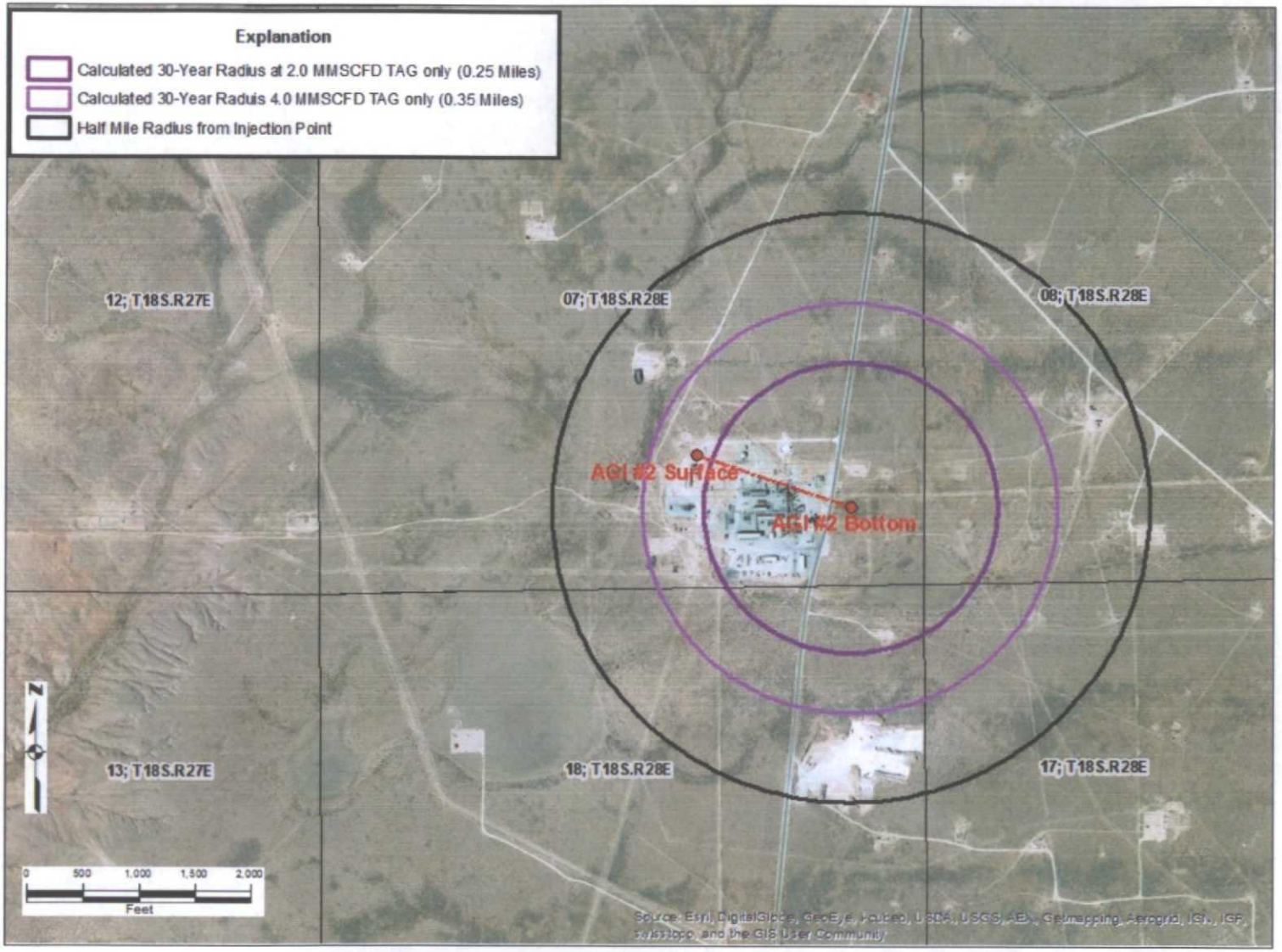

Figure 3a: Calculated Radii of Injection Plume – TAG Only

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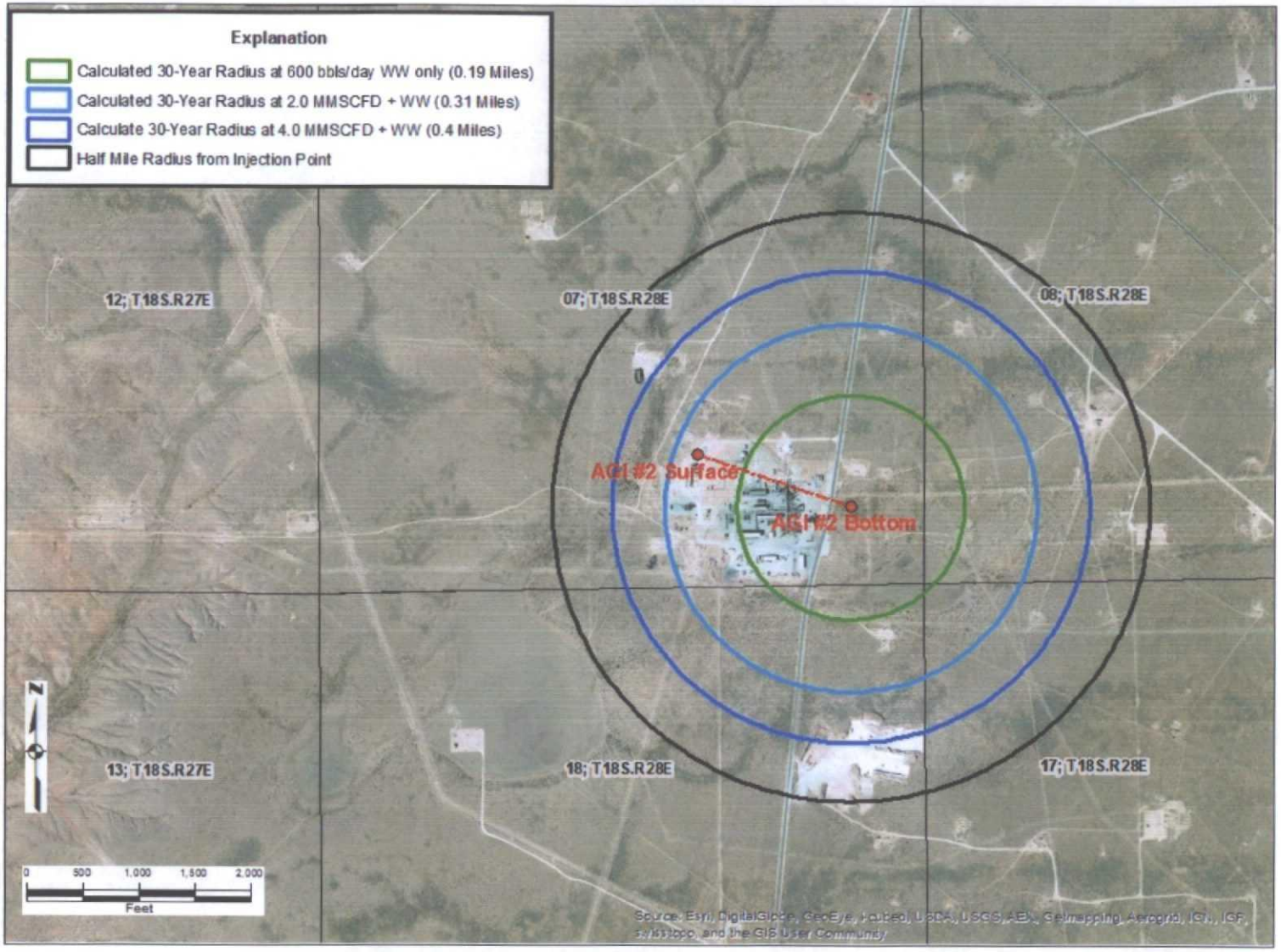

Figure 3b: Calculated Radii of Injection Plume – TAG and Wastewater

Adjacent Operators and Surface Owner Notification and Notices

- The C-108 form summarizing the application was sent to adjacent operators and surface owners within a 1 mile radius of the proposed bottom hole location of the well via Certified Mail, Return Receipt Requested.
- No objections to DCP's application have been submitted.
- Adjacent operators have been individually notified and do not oppose the project.
- The project will allow increased throughput and increase royalties paid to the State of New Mexico while protecting fresh water resources and correlative rights.

Requirements for an AGI Reservoir

- Geologic seal to permanently contain injected fluid
- Isolated from any fresh groundwater
- No effect on existing or potential production
- Laterally extensive, permeable, good porosity
- Excess capacity for anticipated injection volumes
- Compatible fluid chemistry

✓ **DCP's proposed Artesia AGI #2 meets all of these criteria**

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Identification & Characterization of Wells, Stratigraphy & Geologic Structure in the Project Area

- Twenty five current wells and one permitted, not yet drilled well were identified in the one-half mile radius of the proposed AGI location, of which nine are active oil/gas wells, six are active injection wells (including the current Duke AGI #1 and DCP Artesia SWD #1), and ten that are plugged and abandoned (Figure 4).
- Only three of these wells penetrate the injection zone. These are the current Duke AGI #1 and DCP Artesia SWD #1 and a salt water disposal well (State CG #1) operated by Ray Westall Operating, Inc. There are no wells completed or producing from the proposed injection zone in this area (see Figure 5).
- A review of the completion reports indicate that the injection zone is properly isolated by all of the penetrating wells within calculated radius of injection of the proposed AGI #2 well including a 100% volume safety factor (0.4 miles from the injection point of the proposed well).

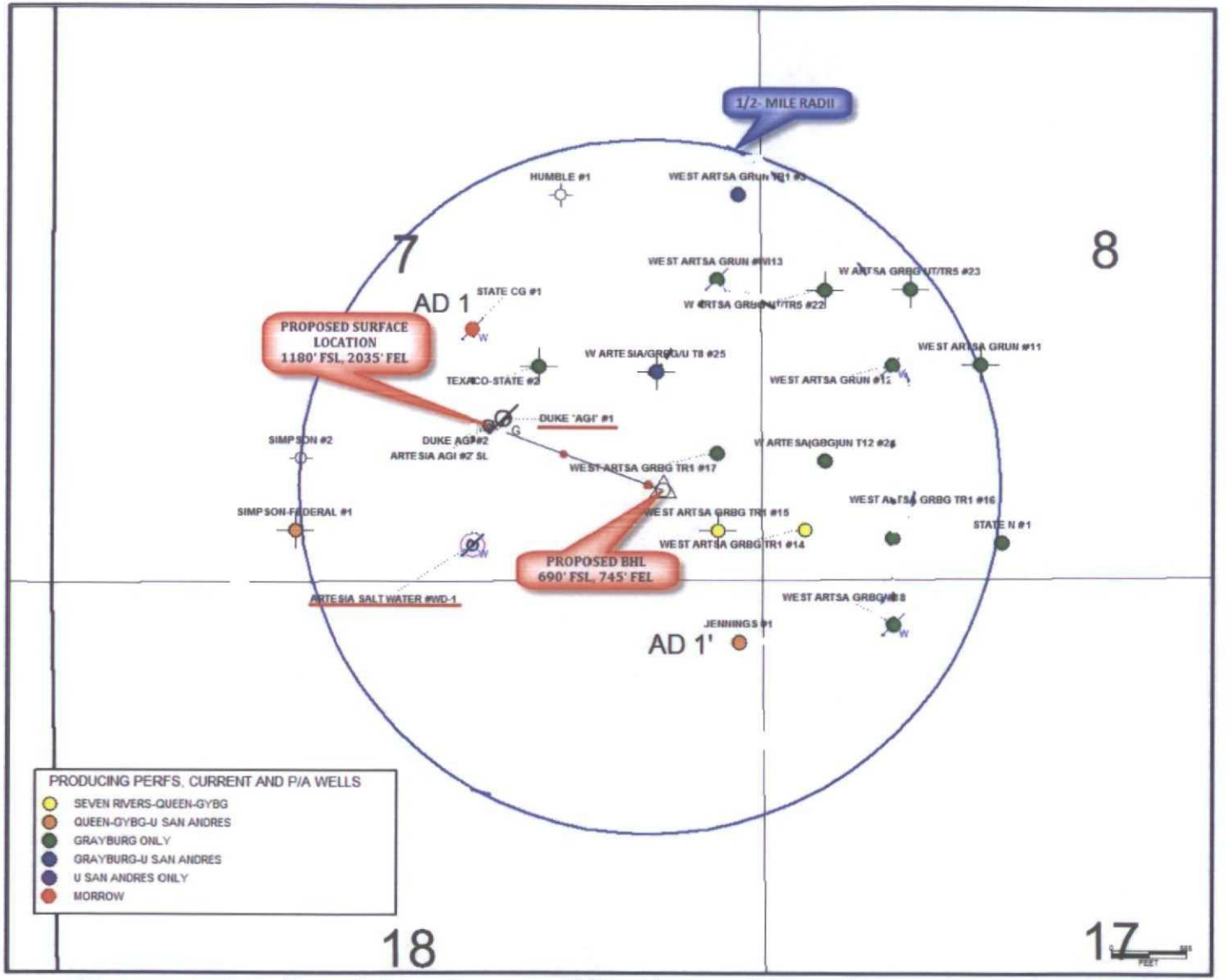

Figure 4: Wells within One-Half Mile Radius of Proposed DCP Artesia AGI #2 Injection Zone

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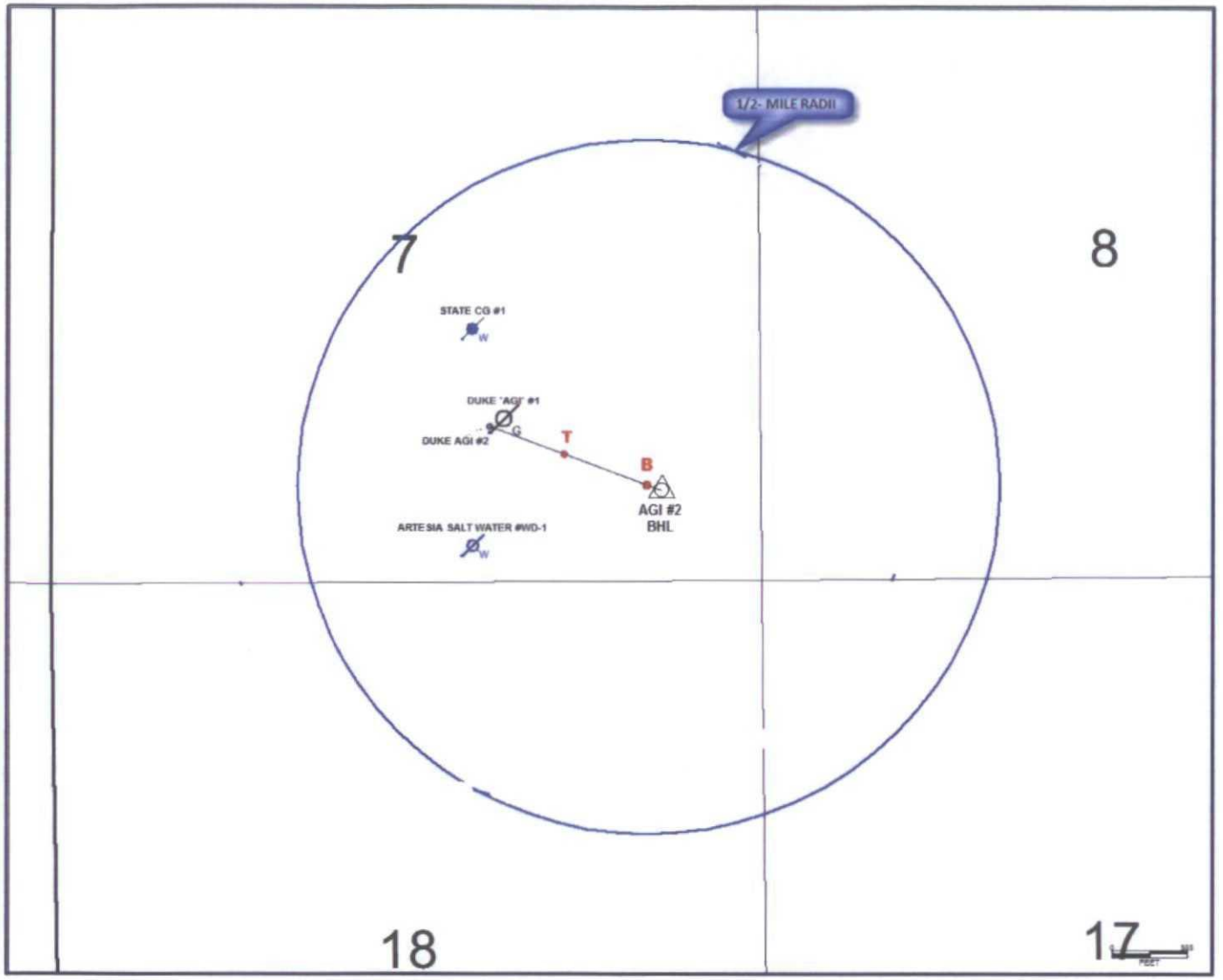

Figure 5: Wells within One-Half Mile of Proposed DCP Artesia AGI #2 Injection Zone that Penetrate the Proposed Injection Reservoir

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All Wells Penetrating the Injection Zone Effectively Isolate the Zone

- The Artesia SWD #1 will be plugged and abandoned in accordance with NMOCD regulations prior to any injection operations at the proposed AGI #2.
- The DCP Duke AGI #1 has surface, intermediate and production casing strings cemented to the surface, completely isolating the proposed injection zone.
- The State CG #01 salt water disposal well has surface and intermediate casing strings cemented to the surface, and the production string is cemented to within 600 feet of the surface, also completely isolating the proposed injection zone.

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Structure and Stratigraphy of Proposed Injection Area

- The proposed well will be located on the northwest shelf of the Permian Basin (see Figures 6 and 7).
- The San Andres, Glorieta and Yeso Formations are porous marine carbonates and are contained above and below by low-permeability siltstone and shale (see Figure 8).

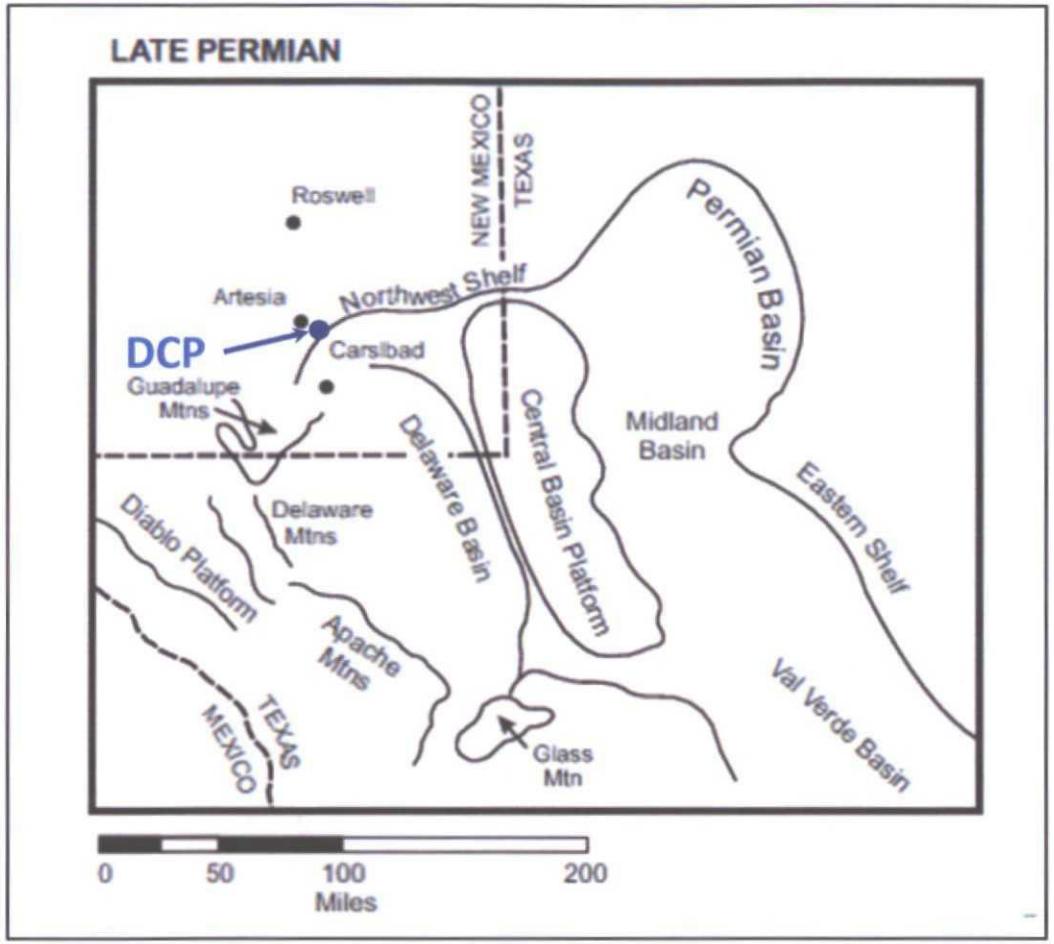

Figure 6: Structural Features of the Permian Basin During the Late Permian; Modified from Ward, et al (1968). Location of the DCP Artesia Gas Plant is Shown by the Blue Arrow.

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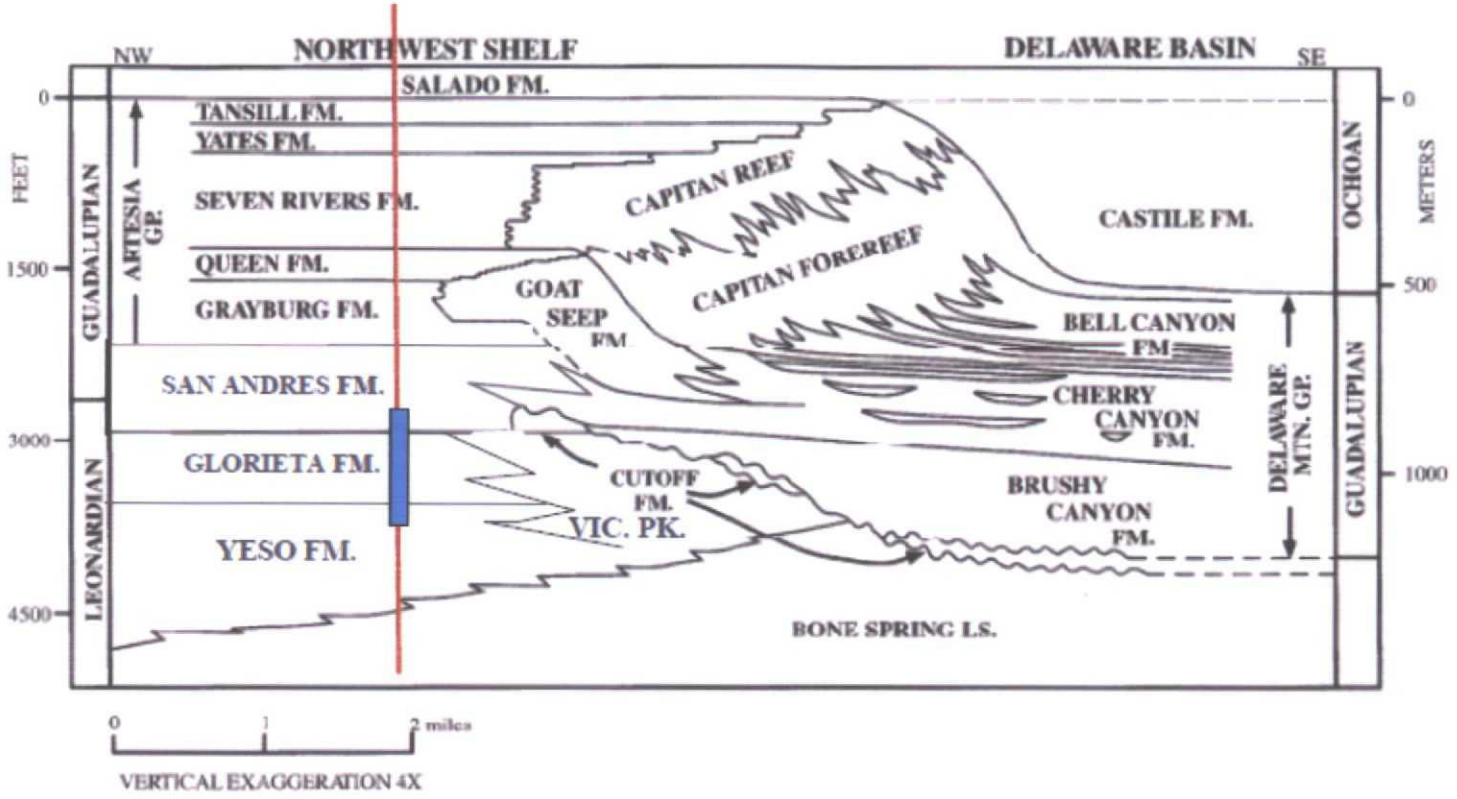

Source: Melim and Scholle, 1999

Figure 7: Generalized Upper Permian Stratigraphy Around the DCP Artesia Gas Plant and Proposed DCP Artesia AGI #2 Well Site – the Proposed AGI Zone is Approximated by the Blue Bar

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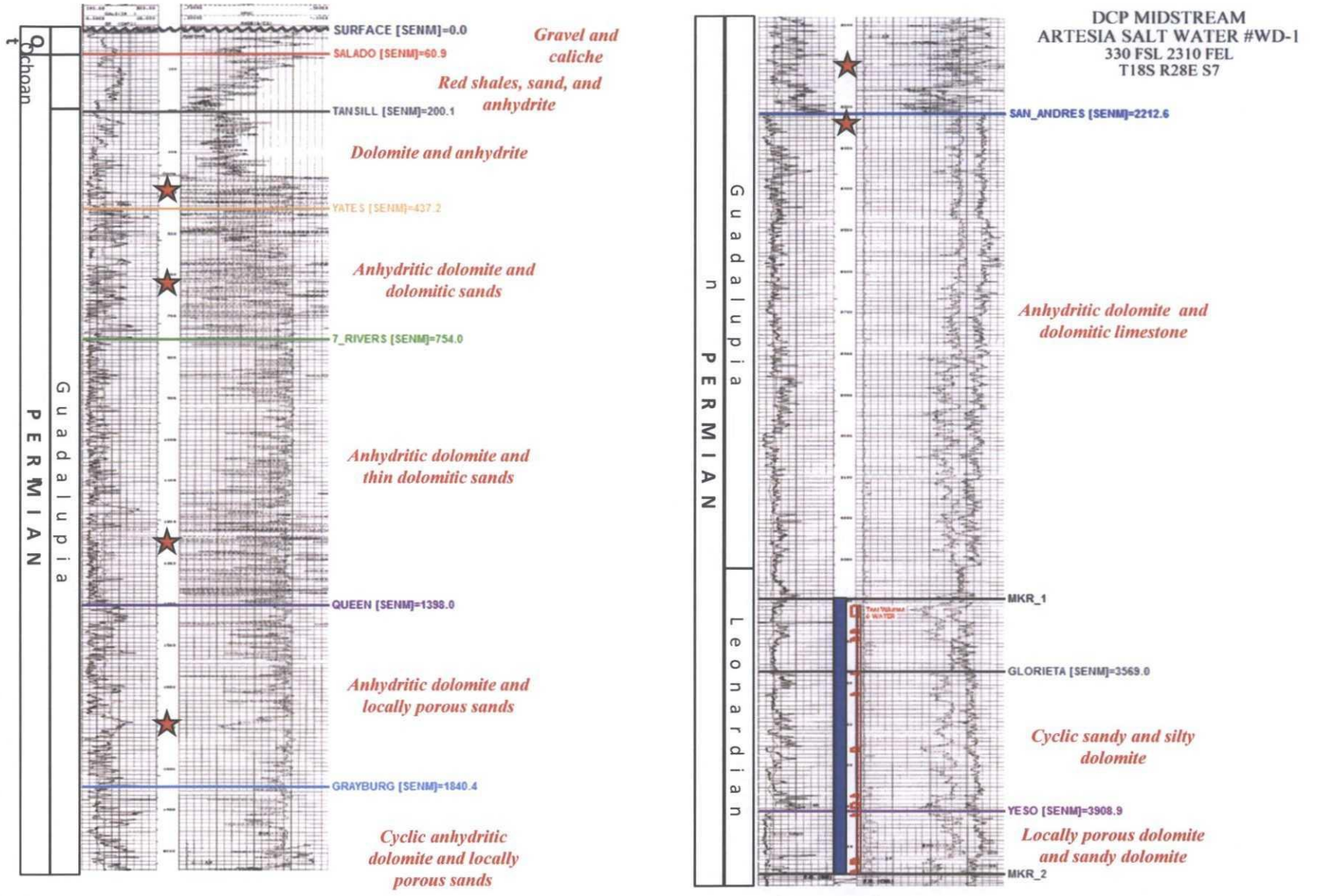

Figure 8: Geophysical Log from DCP Artesia SWD #1

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Porosity Targets for Artesia AGI #2

- DCP Artesia AGI #2 will be drilled at approximately the same surface location as the Duke AGI #1, but in a different injection zone.
- The deviated borehole will expose more of a porosity section to the wellbore along the deviated well path.
- On Figure 9, yellow denotes porosity, and brown shading indicates tight (caprock) facies.
- Figure 10 shows the areal distribution of porosity in the target zone. The well's path was chosen to intercept the best net porosity in the zone.

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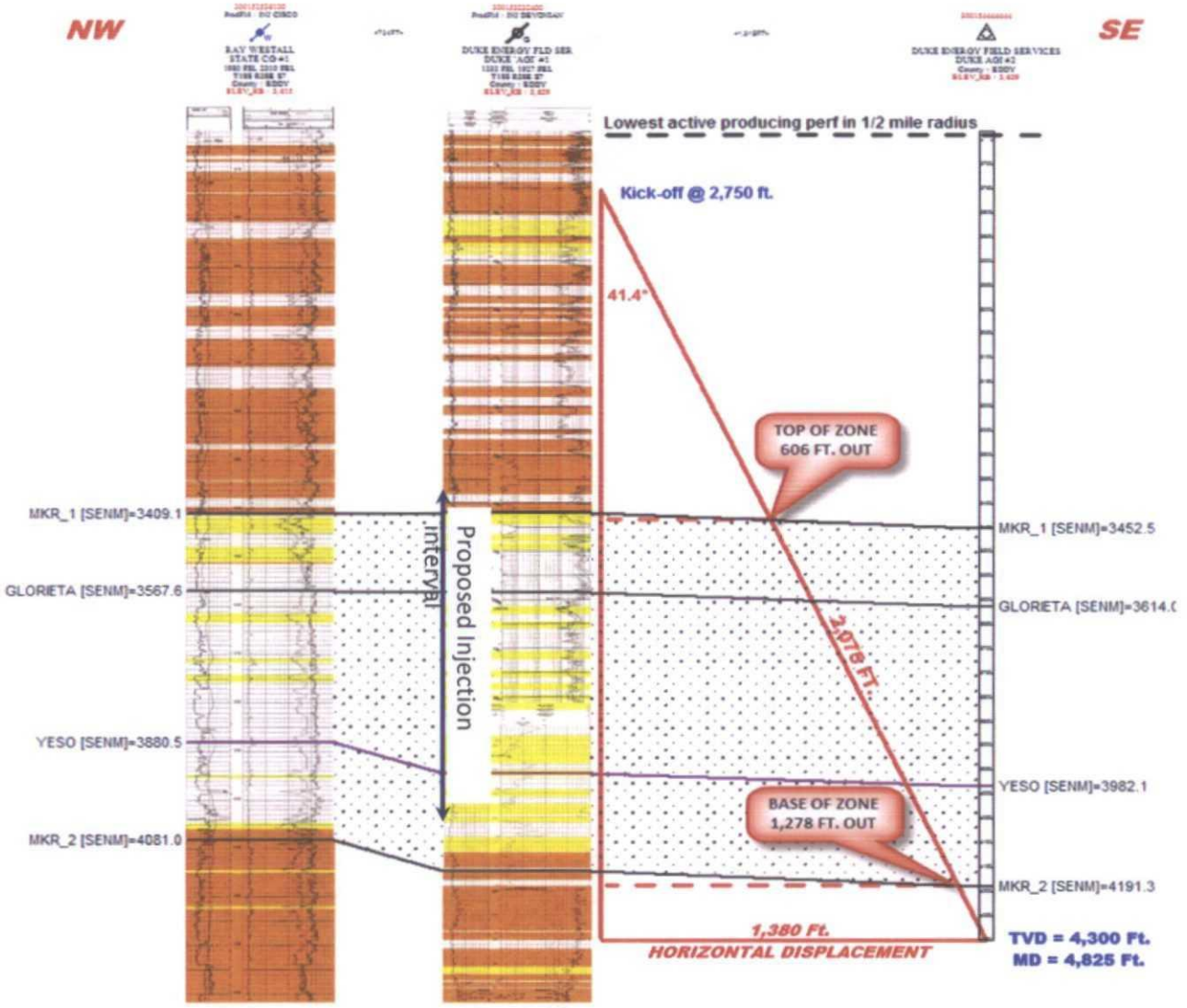

Figure 9: Injection Zone Depths and the Deviation of Proposed DCP Artesia AGI #2

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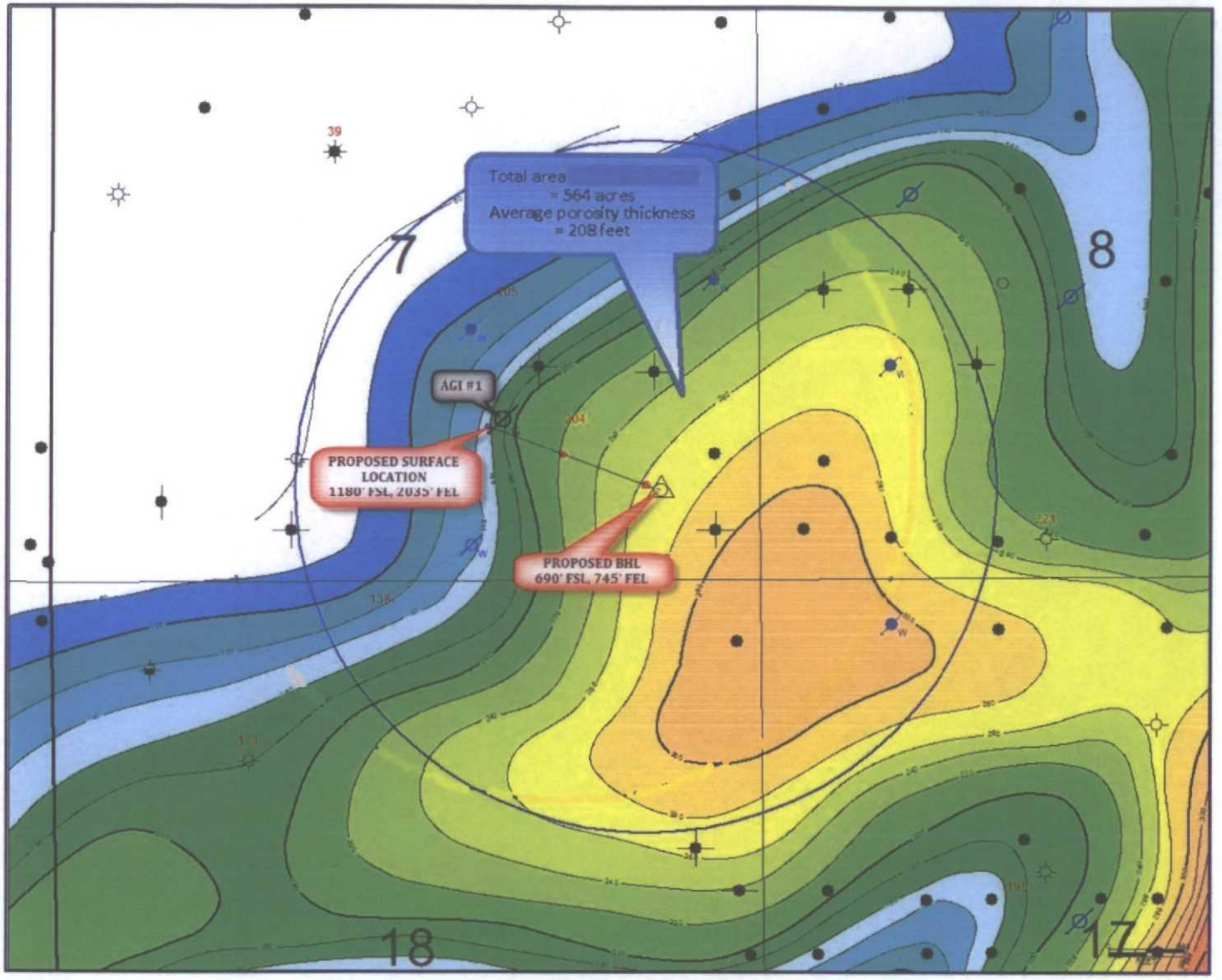

Figure 10: Average Net Porosity-Feet within One-Half Mile of Proposed DCP Artesia AGI #2

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General Design of AGI System

- A schematic of the AGI system is shown in Figure 11, and the well details are shown in Figure 12.
- The surface compressors and lines are protected with automatic safety valves to prevent overpressure, and to isolate the TAG lines in the event of leaks.
- The new well will include an automatic subsurface safety valve (SSSV) and permanent packer constructed of corrosive-resistant materials capable of handling an injection stream of TAG only or TAG/wastewater mix.
- Fresh water will be protected by the surface casing, extending to 525 feet.
- Approximately 250 feet of SM-2535, or equivalent, corrosion-resistant production casing will be installed between 3,400 to 3,650 feet to protect the packer and packer seat.
- The entire production tubing will be lined with fiberglass to prevent corrosion.
- The annulus between the production casing and tubing will be filled with corrosion-inhibited packer fluid.
- Annular and injection tubing pressures and temperatures will be continuously monitored and recorded at the surface and the bottom hole.

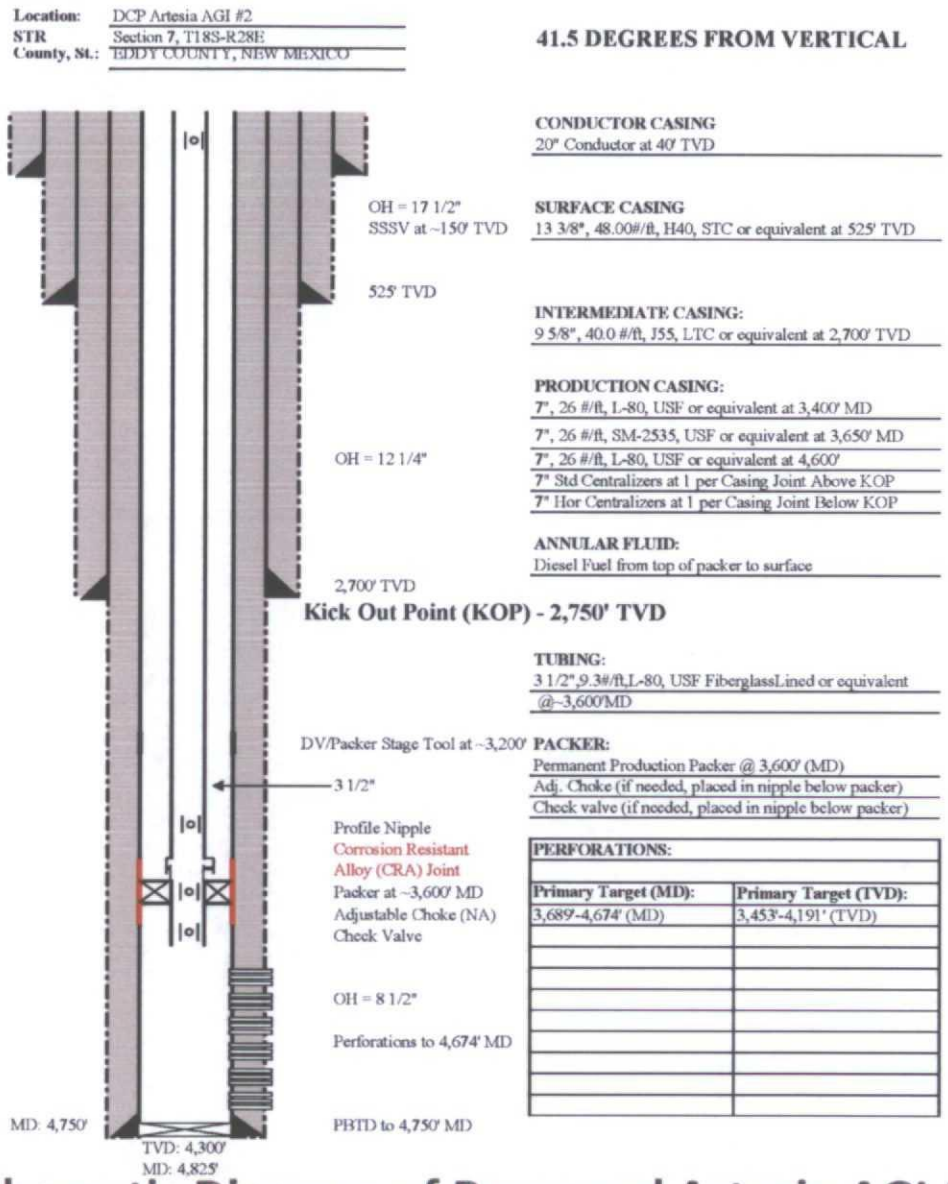

Figure 11: Schematic Diagram of Proposed Artesia AGI #2

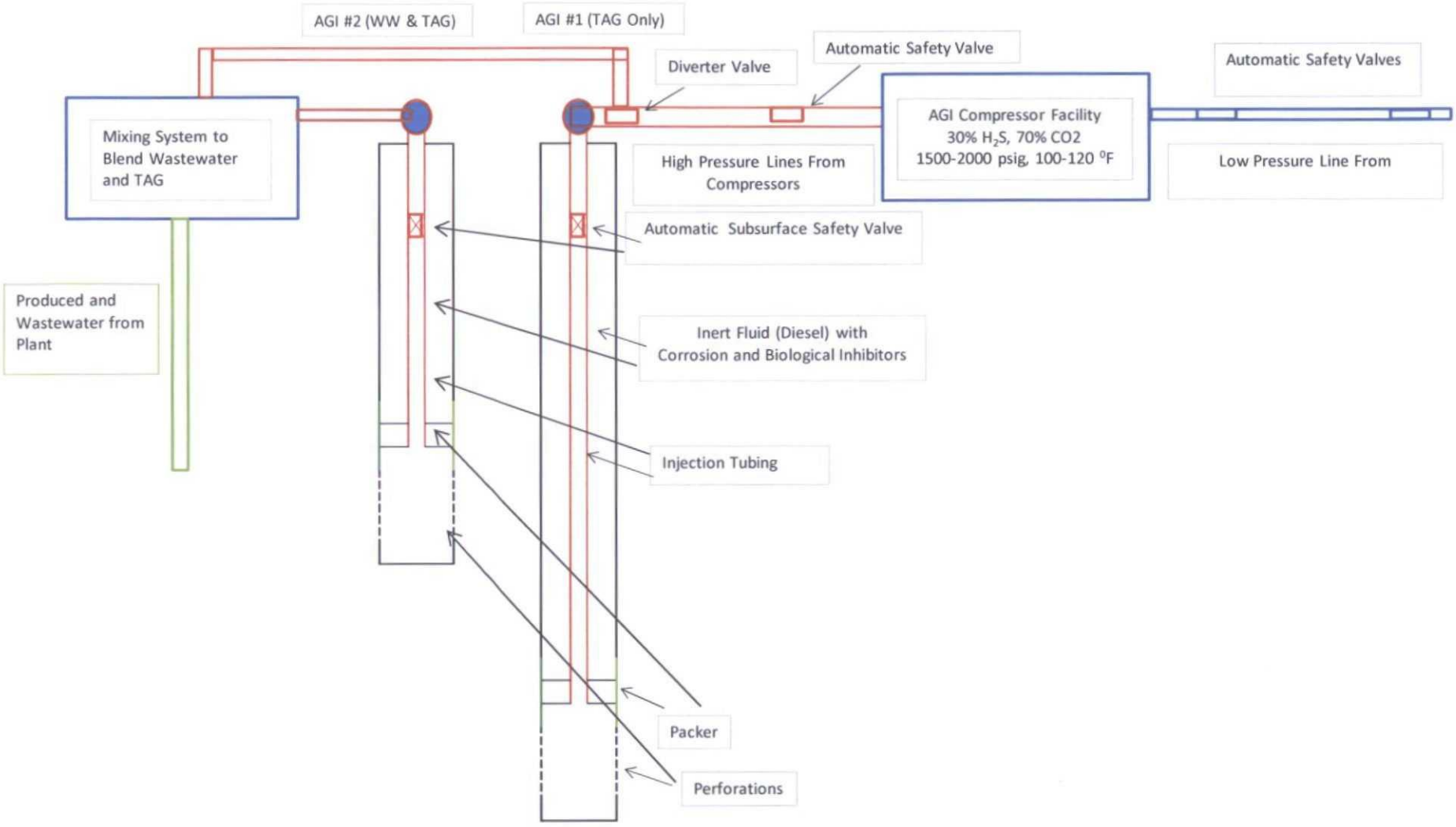

Figure 12: Schematic Showing Existing AGI Facilities and Tie In To Proposed DCP Artesia AGI #2

Casing and Cement Details

- All casing strings will be cemented to the surface, pressure tested, and verified using 360-degree cement bond logs.
- The deviated production string (below 2,750 feet) will be cemented in the critical cap-rock area with acid-resistant cement (CORROSACEM™ or equivalent).
- In the deviated interval, additional centralizers will be used to assure that the casing is centered in the borehole, and that cement flow is continuous.

Groundwater Conditions in the Area of Review

- Based on the New Mexico Water Rights Database from the New Mexico Office of the State Engineer and site observations, there are two windmill wells (East Windmill and West Windmill) located outside the plant.
- During the preparation of the C-108, record searches identified the windmills, as well as an "unknown" well and a "monitor well".
- Subsequent research has shown that the "unknown well" is apparently a duplicate record for the East Windmill.
- The recorded "monitor well" may be one of six wells operated in the 1980's by the then-owner Phillips Petroleum to monitor a surface impoundment. These wells were plugged and abandoned after the impoundments were closed in 1989-1990.
- There are no other known water wells within one half mile of the proposed AGI #2.
- The wells within the one mile radius are shallow, collecting water from surficial alluvium – the Dockum Group is absent in this area and the Salado is at the surface or just below the alluvium.
- The wells' locations are shown in Figure 13.

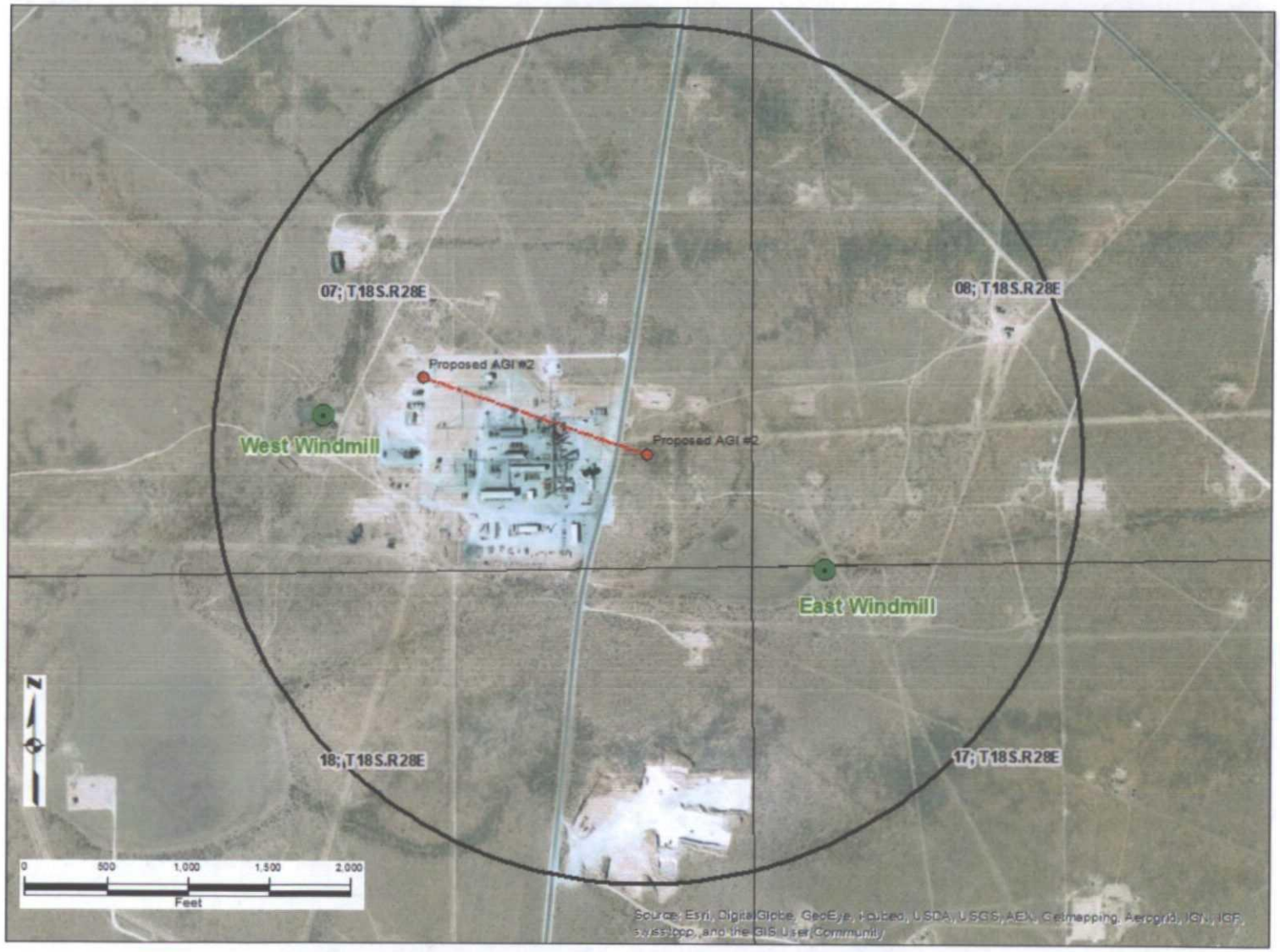

Figure 13: Water Wells Within One-Half Mile of Proposed DCP Artesia AGI #2

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Summary of Geologic Factors Assuring Integrity and Safety of Proposed AGI Well

- No faults or structural pathways identified in the area of review.
- Caprock is low porosity, impermeable rock which is effective barrier above injection zone.
- Injection zone is vertically and horizontally isolated adjacent production zones.
- The thin alluvial fresh water zone isolated by conductor and surface casing.
- Proposed injection pressure is well below fracture pressure of reservoir and caprock.
- Log analyses demonstrate closed system.

DCP's Request for NMOCC Order

- Drill, test and complete AGI #2 as specified in DCP's C-108 application at the location identified in Section 7 T18S R28E adjacent to the existing AGI #1.

- DCP requests permission to inject acid gas at a maximum rate of 2 MMCFD and/or TAG/wastewater mix containing up to an average of 600 barrels of wastewater per day, and at maximum operating surface pressure ranging from 1,704 psig (TAG only) to 916 psig (wastewater only).