TARGA

December 9, 2010
NMOCC Hearing on Case 14575

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Executive Summary

- Targa is requesting authority to inject mixed acid gas and wastewater:
  - At a maximum rate of 4075 bbl/day and maximum operating pressure of 1292 psig
  - For a duration of 30-years or until a cumulative 44.65 million barrels has been injected, whichever is greater
- This request provides a 500% safety margin between anticipated area affected after 30 years and location of wells penetrating San Andres

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Presentation Goals

- Demonstrate environmental benefits and overall safety of Targa's AGI/SWD project at the South Eunice Gas Plant
- Describe relevant Site geology and AGI system design
- Summarize all required components of application as documented in C-108 application
- Address specific Concerns and Recommendations from Oil Conservation Division Pre-Hearing Statement
  - Point-by-point discussion of Concerns and Recommendations at end of presentation

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Key Elements of Targa's C-108

- AGI project has substantial environmental benefits of greenhouse gas reduction due to sequestration of CO_2 which otherwise would be released to atmosphere
- AGI project reduces waste and potential air emission upsets by eliminating sulfur production as control for sulfur in sour gas
- Nearby oil and gas wells, nearby water wells and surface water will be protected by well design and geologic factors
- Wells penetrating the San Andres will be protected by limiting the total injection volume or permit duration

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

- Adequacy of San Andres as injection reservoir has been demonstrated by successful injection of produced water in existing SWD well and Jal#3 SUGS AGI/SWD well also completed in San Andres Formation
- Targa's C-108 application details the full information needed to approve the installation of AGI well
- Corrected and verified records of injection by existing SWD well have already been submitted NMOCD
- H_2S Contingency Plan for proposed AGI has been submitted for approval by NMOCD on October 8, 2010
- Adjacent operators support project and surface owners have received proper notice

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Location of Targa's South Eunice Existing SWD Well

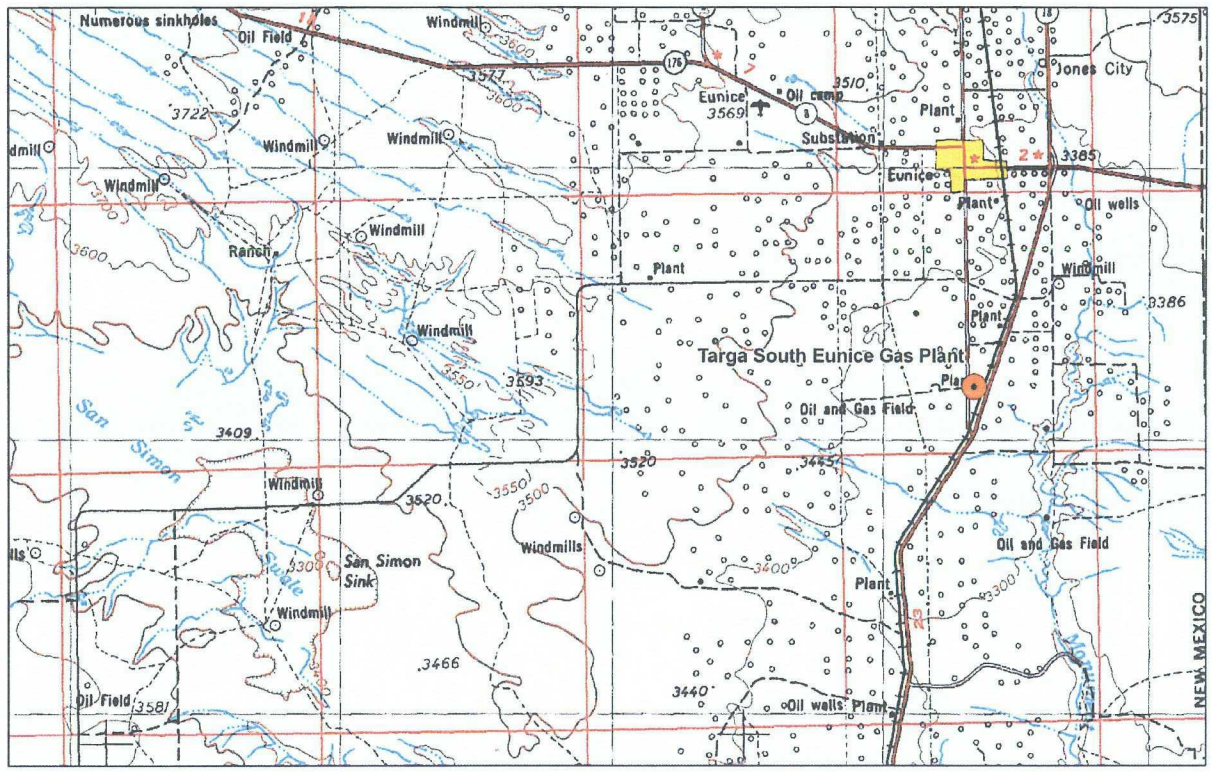

Figure 1: Location of Versado South Eunice Gas Plant

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What Are We Looking For in a Reservoir For CO_2 and Acid Gas Sequestration?

- Geologic seal to permanently contain gas
- Isolated from any fresh groundwater
- No effect on existing or potential production
- Laterally extensive, permeable, good porosity
- Compatible fluid chemistry

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Geologic Evaluation Summary

- Identify background regional geologic data (C-108, Section 4)
- Identify, locate and evaluate all wells in local area (C-108, Section 5 and Appendix C)
- Evaluate stratigraphic information to confirm that reservoir meets basic geologic criteria (C-108, Section 4 and Figures 5-10)
- Construct cross-sections with available logs (C-108, Figures 7,8,10)
- Review SWD disposal well test data (C-108, Section 4)
- Prepare C-108, H_2S Contingency Plan and submit to NMOCD for approval
- NMOCD previously approved this project under Order R-12809 modified to SWD-1161

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Identification & Characterization of Wells, Stratigraphy & Geologic Structure in the Targa AGI/SWD Area

- Producing wells in area of review primarily in shallower Langlie-Mattix Unit
- Targa SWD well used in injectivity evaluation
- Based on stratigraphic analysis and evaluation of existing SWD wells and previous AGI experience, San Andres is excellent acid gas/wastewater reservoir
- Stratigraphic analysis indicates recommended recompletion of existing SWD well
- Data from existing SWD well and Jal#3 AGI/SWD demonstrate ability to take fluid well under calculated maximum permitted pressure using NMOCD guidelines for calculation (1292 psi)
- San Andres is preferable injection zone rather than other potential deeper or shallower targets

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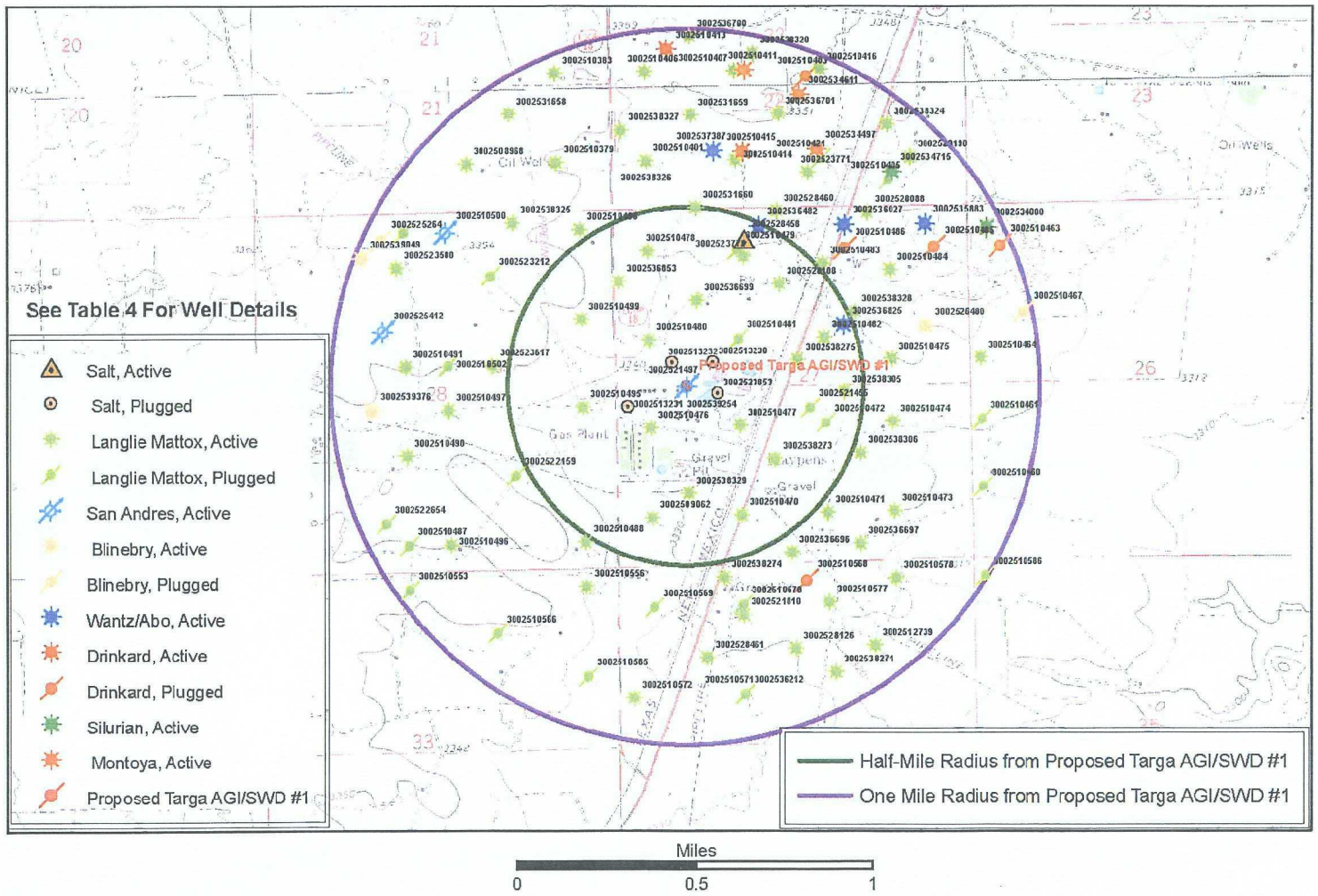
All Wells Within Area of Review



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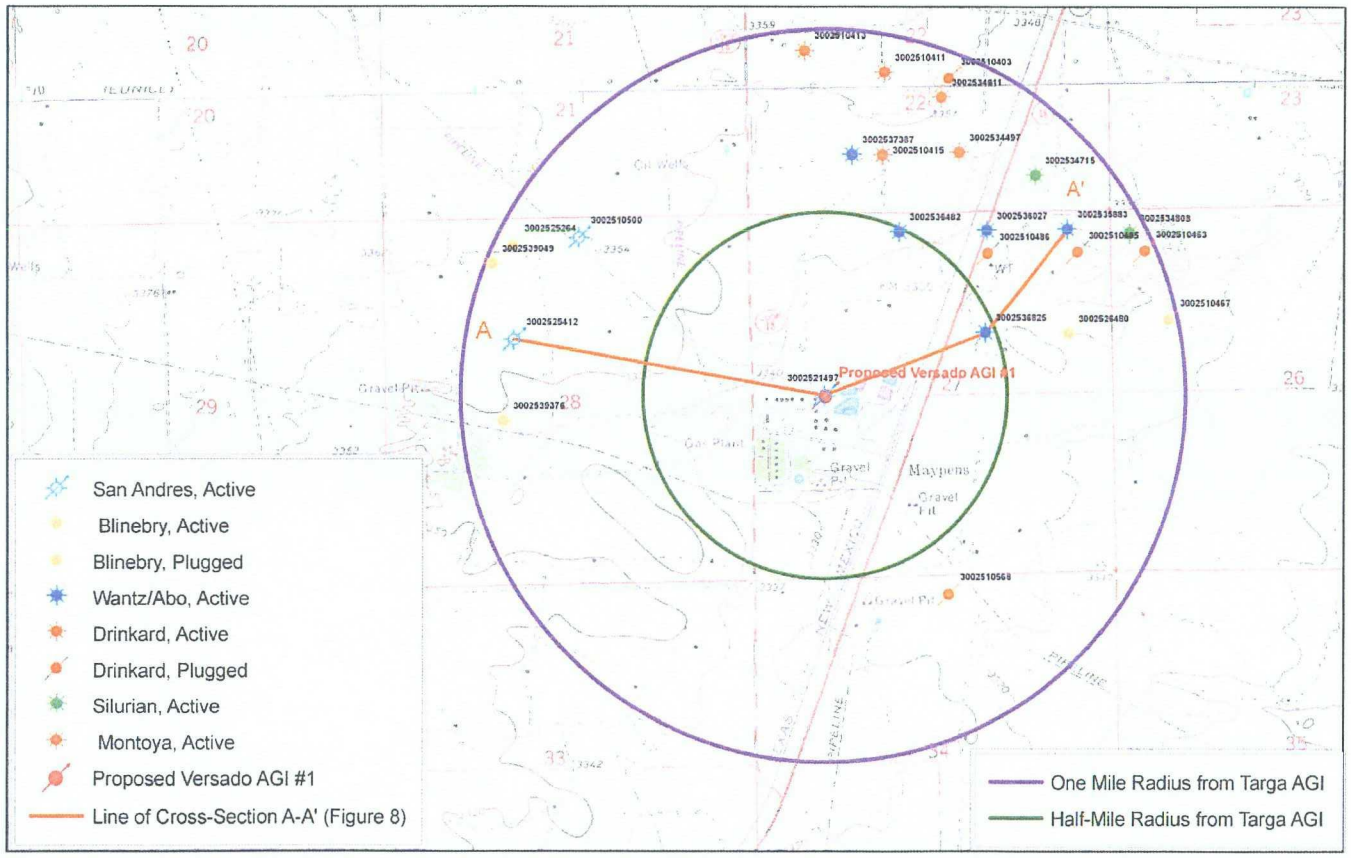
Wells Penetrating the San Andres Within Area of Review



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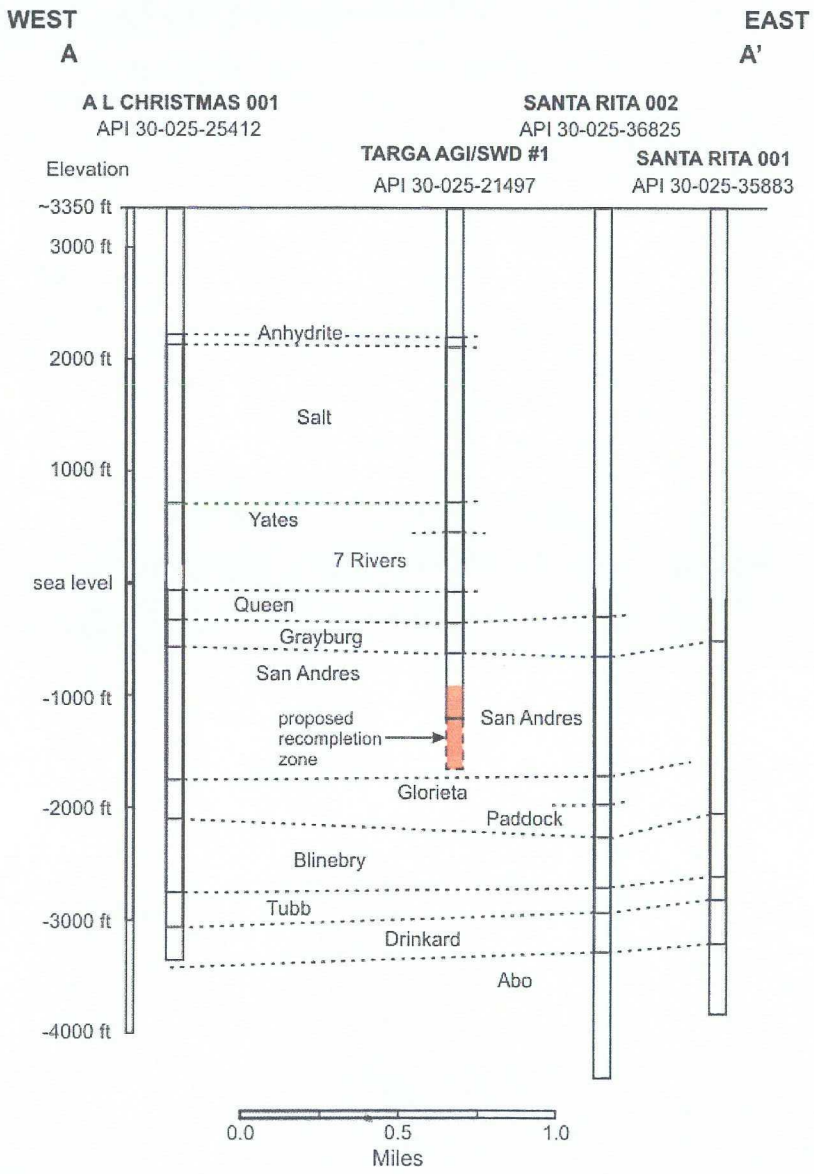
Schematic Regional Cross Section (West-East)

Local production is in the Langlie-Mattix (7 Rivers-Queen) and in the Blinebry-Abo

San Andres is used as an SWD reservoir – the closest SWD well is 0.8 miles away



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Porosity of San Andres Formation Varies Within a Range of 7-12%

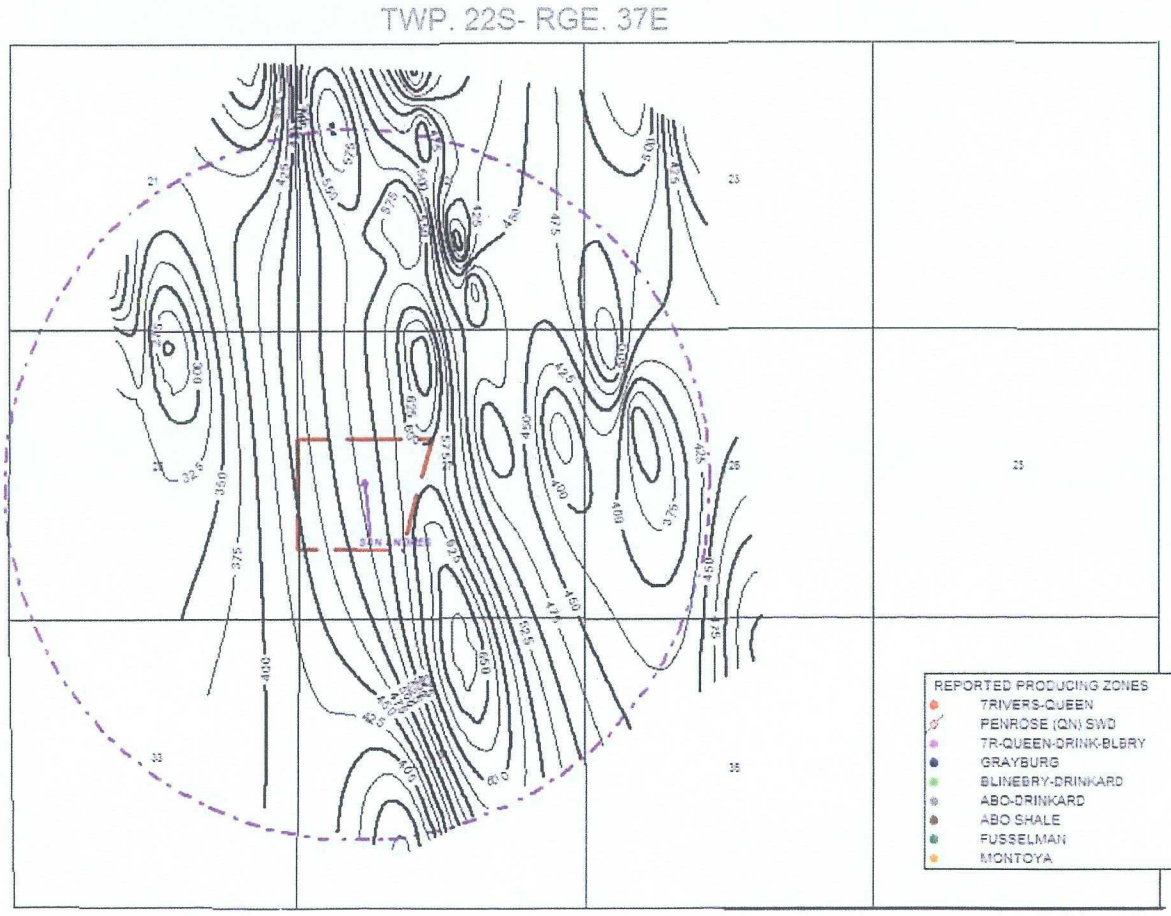

FIGURE 9

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TARGA MIDSTREAM SERVICES, L.P.
SOUTH EUNICE GAS PLANT AGI/SWD WELL
Lea County, New Mexico

Net Porosity (>6%) in the San Andres Carbonate, Top of San Andres to Top of Glorieta Formation

CLIENT: Targa Midstream Services, LP DATE: 11/1/2010

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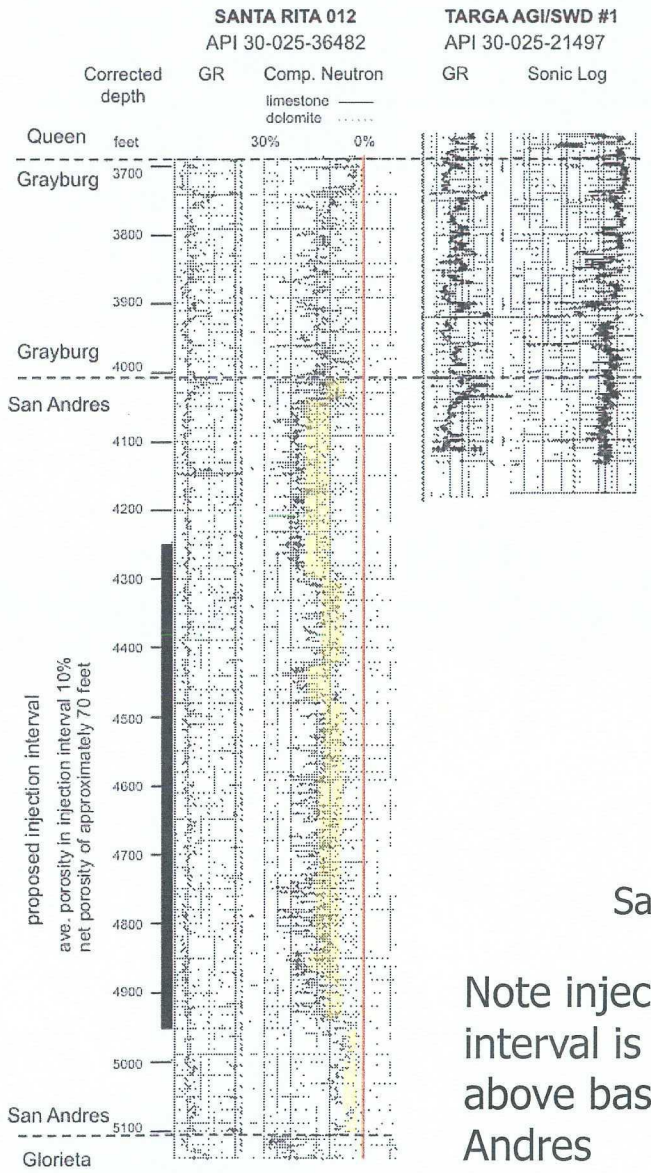


Well Logs Showing San Andres Injection Zone in Vicinity of Proposed Targa AGI/SWD #1

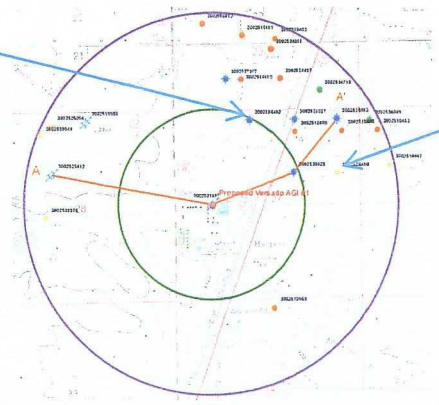
Logs from Santa Rita #12 indicate average porosities of 10% for the proposed injection interval of 4250'-4950'

Laura J May #1 used by NMOCD to determine average porosity is East of well. Santa Rita #12 is closest with porosity log data

Note injection interval is 150' above base of San Andres

Santa Rita #12

Laura J May #1



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Confirmatory Data Collection

- Cores of San Andres will be collected during drilling
- New open hole geophysical logs will be collected for Targa AGI/SWD #1, including:
  - Gamma, Resistivity, Porosity
  - Formation Micro-Imaging Log
- Injection Tests/Survey will be performed using water, including:
  - Temperature survey
  - Step-rate tests
- Data analysis will be performed to refine understanding of reservoir area affected

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Generalized Design of AGI System

- Conceptual design shown on Figures 3 and 4 of Targa's C-108 application. The following safety features are included:
  - Lined injection tubing
  - Automated subsurface safety valve
  - Choke and regulating pressure valves
  - Annulus between casing and tubing loaded with inert fluid and pressure monitored (brine not diesel)
  - Corrosion resistant joint and packer
- Meters will be included to record volumes of acid gas and water injected
- Layout of plant including H_2S monitors shown in H_2S Contingency Plan

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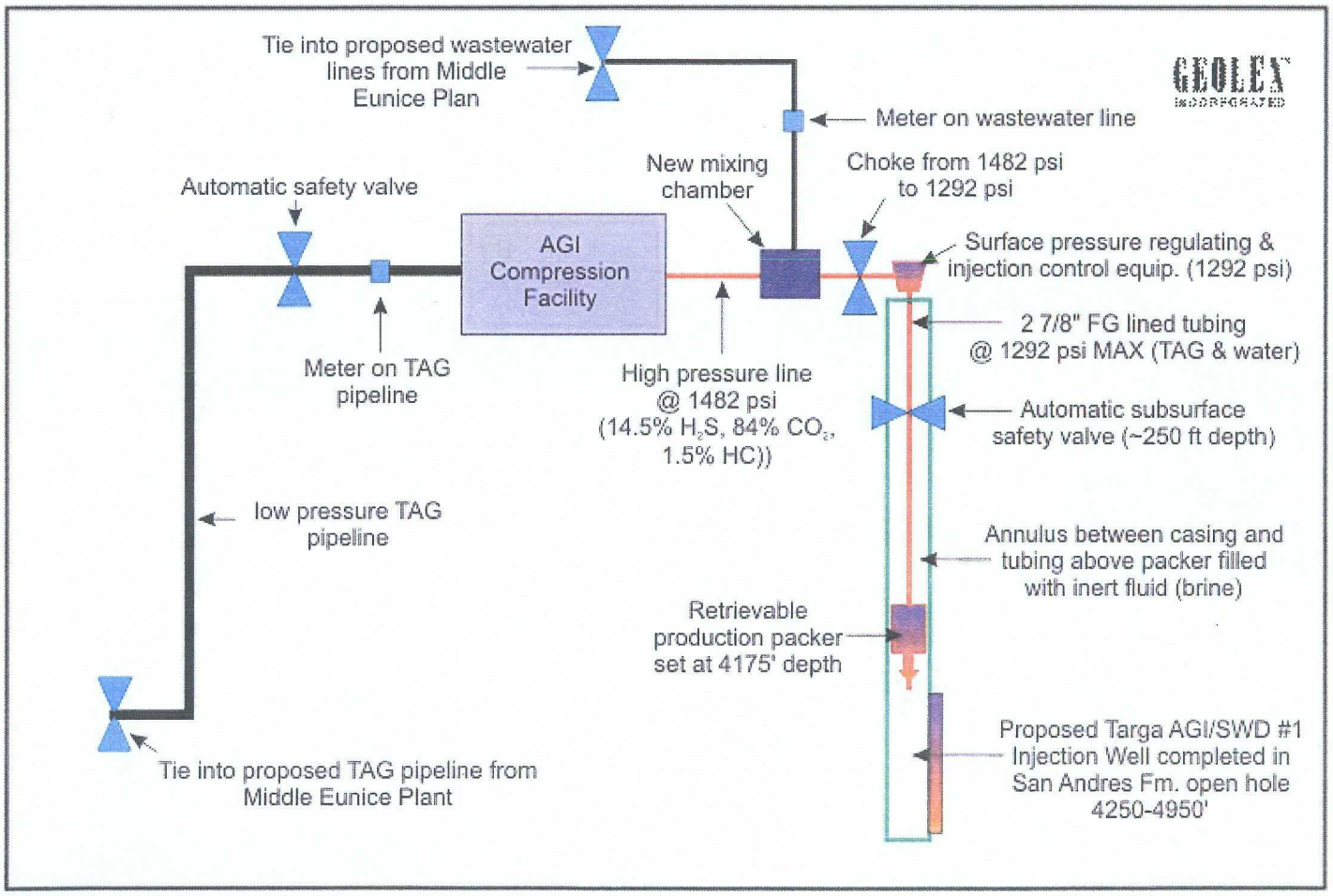
Schematic of Proposed AGI System



Existing and Recompleted Well Configurations

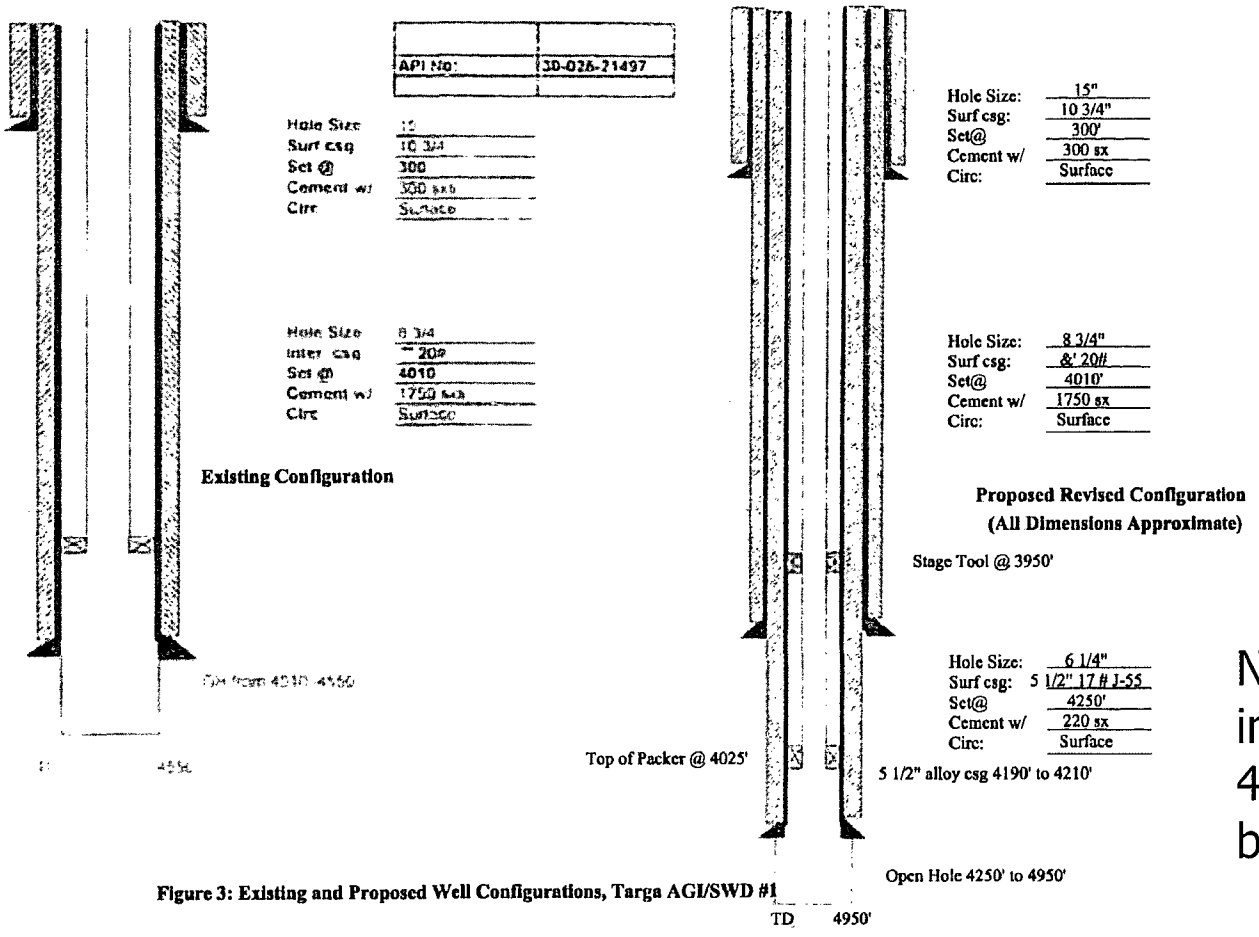


Figure 3: Existing and Proposed Well Configurations, Targa AGI/SWD #1

A successful MIT will be performed prior to requesting permission to inject and at least once every 5 yrs subsequent

Note: the requested injection interval is 4250'-4950', 150' above base of San Andres

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Injection Fluid Volume Considerations

- Initial design for 2500 bbl/d acid gas mixed with up to 1575 bbl/day wastewater and produced water
- This amount is greater than the 1500 bbl/day limit from Order R-5003 issued in 1975 to protect a nearby LPG well
- This limitation is no longer relevant as Targa has plugged the LPG well in 2008

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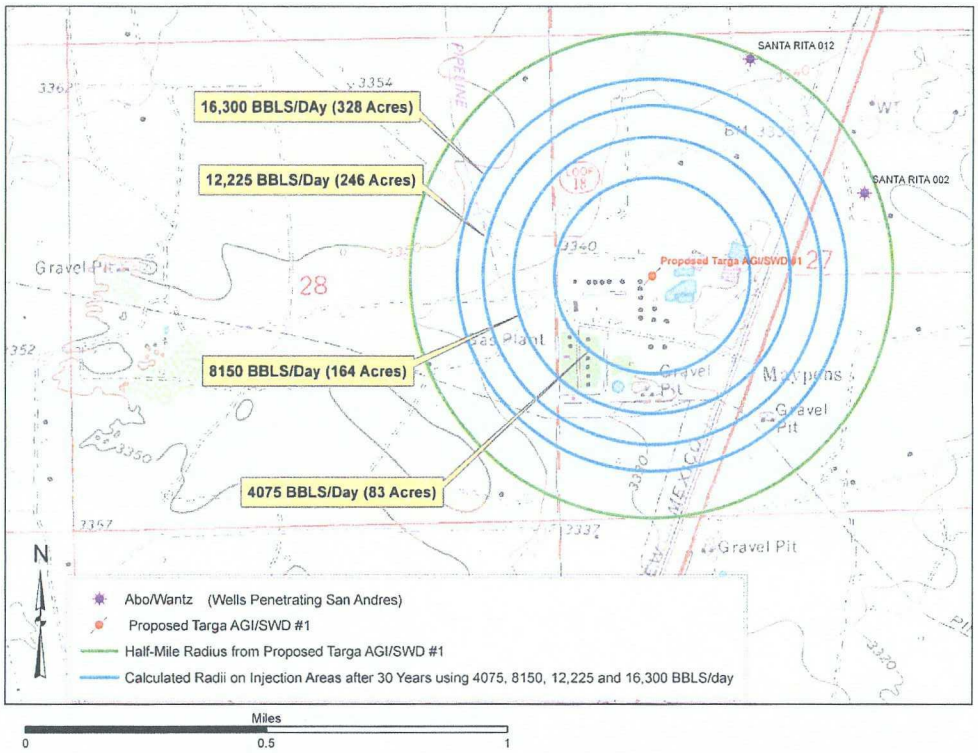
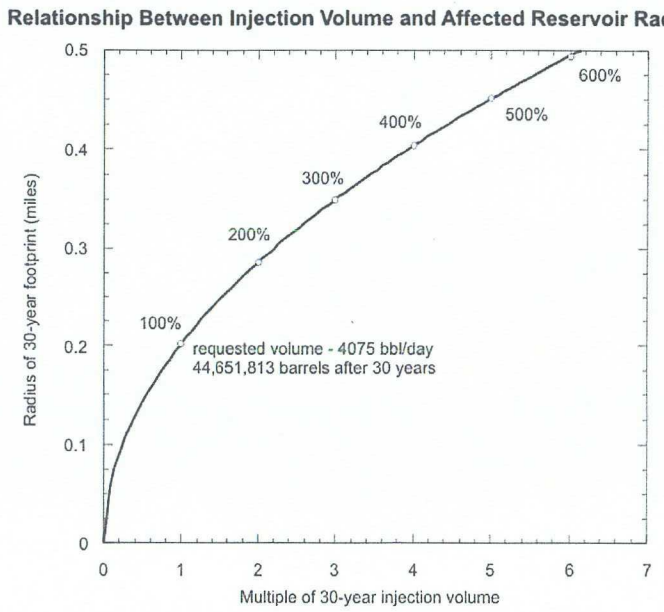
Safety Margins for Calculations of Reservoir Area Affected after 30-Years





While the simple plug model is an idealized approximation of area affected, the requested rate of 4075 bbl/day for 30-years has a 500% safety margin before reaching the half-mile radius where the first wells penetrating the zone are located

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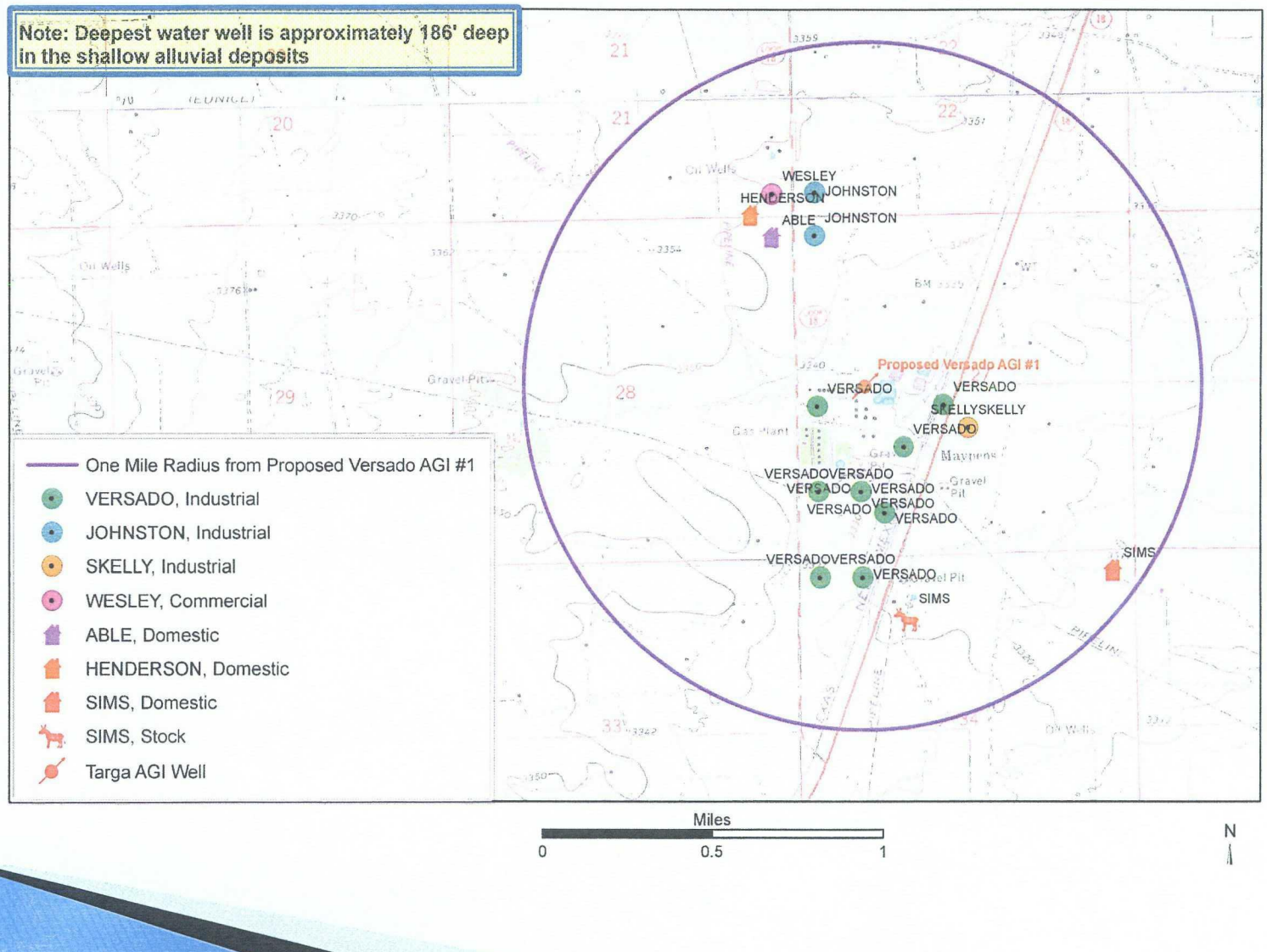
Water Wells in Area of Review



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Summary of Geologic Factors Assuring Integrity and Safety of Proposed AGI

1. No faults or structural pathways identified in the area of review
2. Caprock (Grayburg) is low porosity dolomite and recrystallized limestone which is effective barrier above injection zone
3. San Andres is preferred injection zone as deeper zones may be productive in adjacent areas
4. Proposed injection pressure is well below fracture pressure of reservoir and caprock
5. Injection history of SWD wells in San Andres demonstrate closed system
6. No wellbores penetrated injection zone within the anticipated AGI footprint even after 30 years of injection
7. Targa will recomplete and plug back the Langlie Mattix Penrose Sand Unit Well No 252

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

1. Surface casing set over 100' below deepest fresh water, cemented to surface
2. New production casing to be set within surface casing and cemented to surface with CRA joints at base in which packer will assure the integrity of the base of the production casing exposed to acid gas in injection zone below the packer
3. Cement bond logs will assure casing seal to formations
4. Corrosion resistant fiberglass-lined tubing will be inside the production casing and stabbed into CRA packer with annular space filled with inert fluid (brine) and monitored for pressure to indicate potential tubing leak before it can affect production casing
5. Similar designs have been implemented successfully without any leakage problems at similar and deeper zones in SE NM, Texas and Alberta, Canada, for many years including 4 such installations designed, permitted and completed by Geolex

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Adjacent Operators and Surface Owner Notification and Notice

- Targa's C-108 application details the full information needed to approve the recompletion of the SWD as a combined AGI/SWD well and was provided to all adjacent operators and surface owners within 1 mile radius of proposed well via Certified Mail, Return Receipt Requested
- Surface owners and operators have confirmed receipt of notice and application link (included as Exhibit 2)
- Notice was published in Lovington Paper as required by NMOCC
- Adjacent operators support project which will allow increased throughput and increase royalties to State of New Mexico
- NMOCD Environmental Bureau was provided H_2S Contingency Plan for proposed AGI operation on October 8, 2010 at meeting with Targa and Geolex

Response to NMOCD Pre-Hearing Statement

NMOCD Concern A

Langlie Mattix Penrose Sand Unit Well No 252 should be repaired

Targa's Response:

- **Reopen and repair well as proposed in Targa's C-108 application**

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NMOCD Concern B

Potential impact on wells penetrating the San Andres outside of the ½ mile radius

Targa's Response:

- **Proposed injection volume after 30 years only extends to 0.2 miles from well**
- **500% safety margin is still within ½ mile**
- **Base of injection zone 150' above "thief zone"**
- **Injection fluid buffered by San Andres**

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NMOCD Concern C

Prediction of reservoir area affected is sensitive to model assumptions

Targa's Response:

- **Existing model has 500% safety margin within ½ mile radius**
- **Confirmatory data collection part of well re-completion program as proposed in Targa's C-108 application**

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NMOCD Concern D

Existing logs not sufficient to characterize injection zone

Targa's Response:

- **Full logging program proposed in Targa's C-108 application, as part of re-completion, will confirm formation porosity**
- **Side-wall cores will be collected to directly measure porosity**

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NMOCD Concern E

Perfect plug-like displacement by injection fluids is unlikely

Targa's Response:

- **Potential uncertainties in simple plug model are well within 500% safety margin**
- **Confirmatory data will be gathered during well re-completion as proposed in Targa's C-108 application**
- **Results of analysis will be supplied to NMOCD**

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NMOCD Concern F

Additional data gathering

Targa's Response:

- **Confirmatory data will be gathered during well re-completion as proposed in Targa's C-108 application**

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NMOCD Concern G

Vertical safety factor required to protect possible thief zone at base of San Andres – top of Glorieta

Targa's Response:

- **Injection interval of 4250'-4950' proposed in Targa's C-108 application provides 150' vertical factor of safety**

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NMOCD Concern H

Proposed injection volume exceeds 1500 bbl/day limit set by R-5003

Targa's Response:

- **This 1975 Order no longer applies since the LPG well was plugged by Targa in 2008**

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NMOCD Recommendation A

Construction and Testing Requirements

Targa's Response:

- **All Construction and Testing Requirements already included in Targa's C-108 application except recommended injection survey, which Targa has agreed to perform following logging**

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NMOCD Recommendation B

Operational Requirements

Targa's Response:

- **Order 5003 is no longer applicable**
- **Remaining operational requirements are already included in Targa's C-108 application**

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NMOCD Recommendation C

Remedial Work on Langlie Mattix Penrose Sand Unit Well No 252

Targa's Response:

- **Remedial work are already included in Targa's C-108 application**

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NMOCD Recommendation D

Confirm Targa's Compliance with Well Construction and Data Collection

Targa's Response:

- **Targa will provide certification by company officer that all well construction and data collection requirements have been completed prior to injection**
- **Targa will submit refined calculation of area of reservoir affected over injection period within one year of Targa's certification**

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NMOCD Recommendation E

Amendment to NMOCC Order Confirming Injection Limit

Targa's Response:

- **Predicted area affected has a 500% safety margin**
- **NMOCC Order should set a maximum of 30 years of injection or a cumulative volume of 44.65 million barrels, whichever is greater**
- **Alternatively, an administrative amendment may be issued to address updated estimate of injection volume or permit time limit, if needed**

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Surface Owner Comments

Targa's Request for NMOCC Order

- Test and recomplete well as specified in Targa's C-108 application

- Inject mixed acid gas and wastewater:
  - At a maximum rate of 4075 bbl/day and maximum operating pressure of 1292 psig
  - For a duration of 30-years or until a cumulative 44.65 million barrels has been injected, whichever is greater

- Draft Order has been provided to NMOCC Counsel

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