NMOCC Hearing To Re-open Case No. 13589 To Amend Order No. R-12546 Allowing the Installation of a Second Well (Linam AGI #2) Lea County, New Mexico

Alberto A. Gutiérrez, RG

Geolex, Inc.

December 20, 2012

GEOLEX INCORPORATED

Outline of Presentation

- Review of Operational History of Linam AGI #1
- Summary of Linam AGI #1 Workover (May 2012)
- Justification for Backup or Redundant AGI Well
- Current Injection Limitations and Requirements
- Summary of Geologic Setting and Injection Zone
- Design Improvements in Linam AGI #2
- Protection of Nearby Production and Water Wells
- H_2S Contingency Plan Review and Safety Measures
- Summary of Environmental and Operational Benefits

Operational History of Linam AGI #1

- Permitted by NMOCC after public hearing in 2006
- Completed in Lower Bone Springs (8710'-9100')
- Well began injection of TAG in December 2009
- NMOCC Order modified several times, most recently in 2011
- Potential communication with annular space detected in late 2011
- OCD approved additional monitoring and reporting requirements while procuring spares for workover/repair in April 2012
- Workover identified tubing leak due to corrosion- ***no release of acid gas occurred***
- Linam AGI #1 was shut down for approximately 3 weeks during repair – coordinated with turnaround to minimize production shut in
- Repair of Linam AGI #1 completed and well back on line May 2012
- Plant has made operational changes and equipment upgrades for better temperature control to prevent corrosion in tubing
- Additional repairs will be required to fully restore Linam AGI #1
- MIT for Linam AGI #1 now on 6 month intervals – most recent completed 11/14/12
- Need for backup or redundant AGI identified to prevent future shutdowns

Summary of Linam AGI #1 Workover (May 2012)

- Linam AGI #1 workover conducted in April-May, 2012 under direct OCD oversight
- Well was killed , went on vacuum and tubing and SSSV removed and inspected
- Tubing was compromised in 60' zone immediately above packer by corrosion due to poor temperature control and release of free water in injection stream
- Remainder of tubing string, SSSV and well tree were inspected thoroughly and showed to be in as new condition
- Casing integrity log run and showed less than optimum integrity in 50' zone above packer
- Attempt to stack a new packer failed when new packer malfunctioned during installation
- Well was tested after replacement of tubing and successfully passed MIT
- Monthly reporting of injection parameters and MIT every 6 months required by OCD until new packer can be installed.
- First 6 month OCD-witnessed MIT completed successfully on 11/14/2012

Justification for Backup or Redundant AGI Well (Proposed Linam AGI #2)

- Plant is now dependent on AGI in order to operate (SRU is fully decommissioned)
- Linam AGI #1 will have to be further worked over to address compromised casing
- Linam Plant services thousands of producing wells which would have to be shut in due to unexpected problem with AGI well
- Redundant well provides "live" backup which can allow for continued safe operation in event of maintenance requirements or repairs/workovers
- Significant new design elements proposed for well that will improve corrosion resistance and material integrity
- Injection reservoir is excellent, fully contained and has very long projected life
- Second well strictly for improving reliability, safety and will not result in either pressure or injection rate increase

Summary of Original Order Requirements for MAOP and Injection Rate

MAOP of 2644 psi with $SG_{TAG} = 0.8$

Calculated using NMOCD's equations:

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

$IP_{max}=PG*Depth$

No injection rate limitation

No change proposed in these parameters for the Linam AGI #2

GEOLEX INCORPORATED

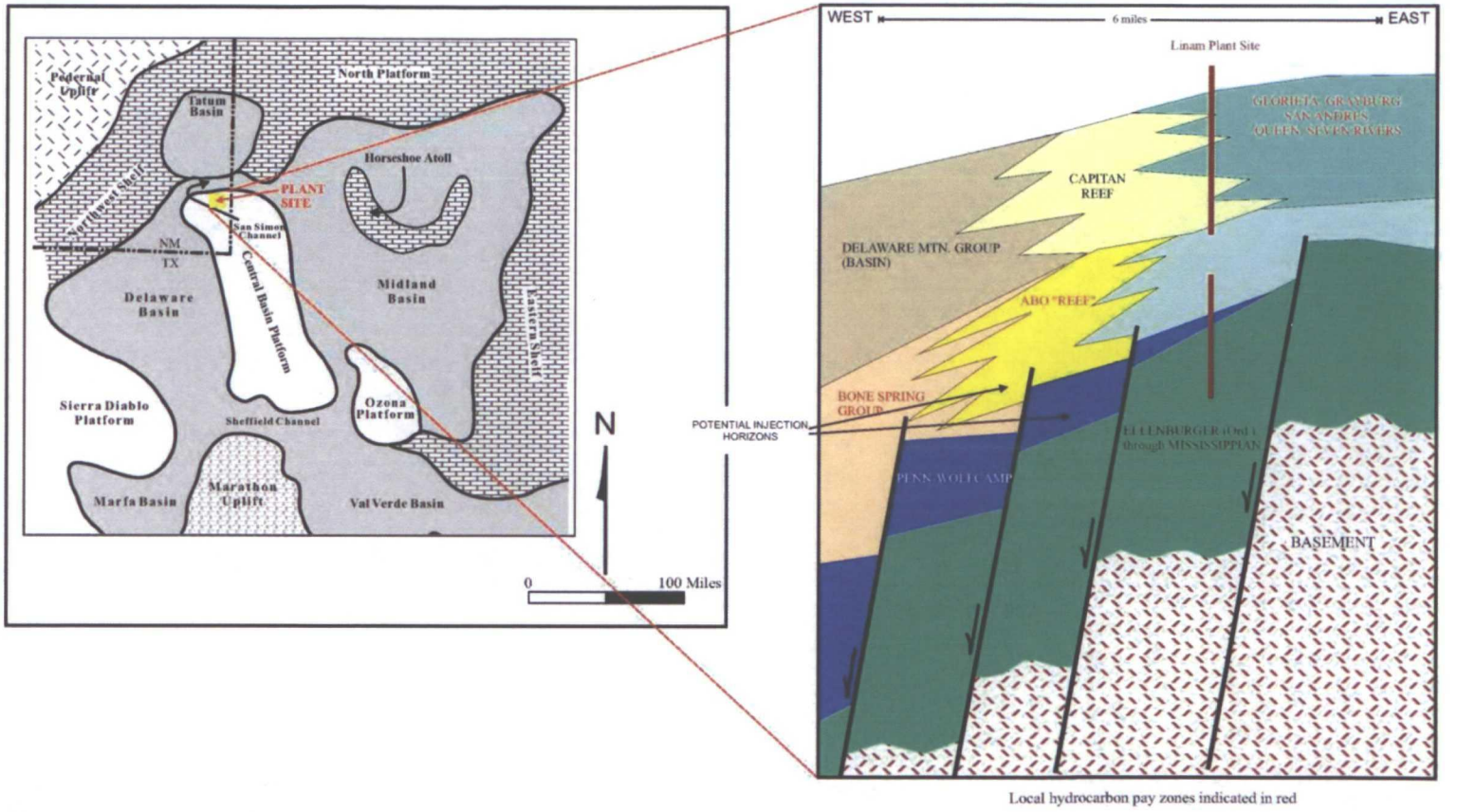
Additional Requirements of Workover C-103

- Monthly analysis and reporting of key injection parameters
- MIT to be conducted every 6 months
- Additional workover to address compromised casing and add stacked packer when new well is operational

Summary of Geologic Setting and Injection Zone

- Detailed presentation of geologic conditions, reservoir geometry and caprock integrity was included in original C-108 approval hearing
- Lower Bone Springs injection zone has proved to be even better reservoir than originally anticipated – excellent closed system and underpressured
- Caprock extremely effective seal for reservoir
- Combination of geologic conditions and well design provide full protection of fresh groundwater and adjacent production
- No new wells have been drilled into the injection zone within a mile of the Linam AGI #1

Geologic Overview



Local hydrocarbon pay zones indicated in red

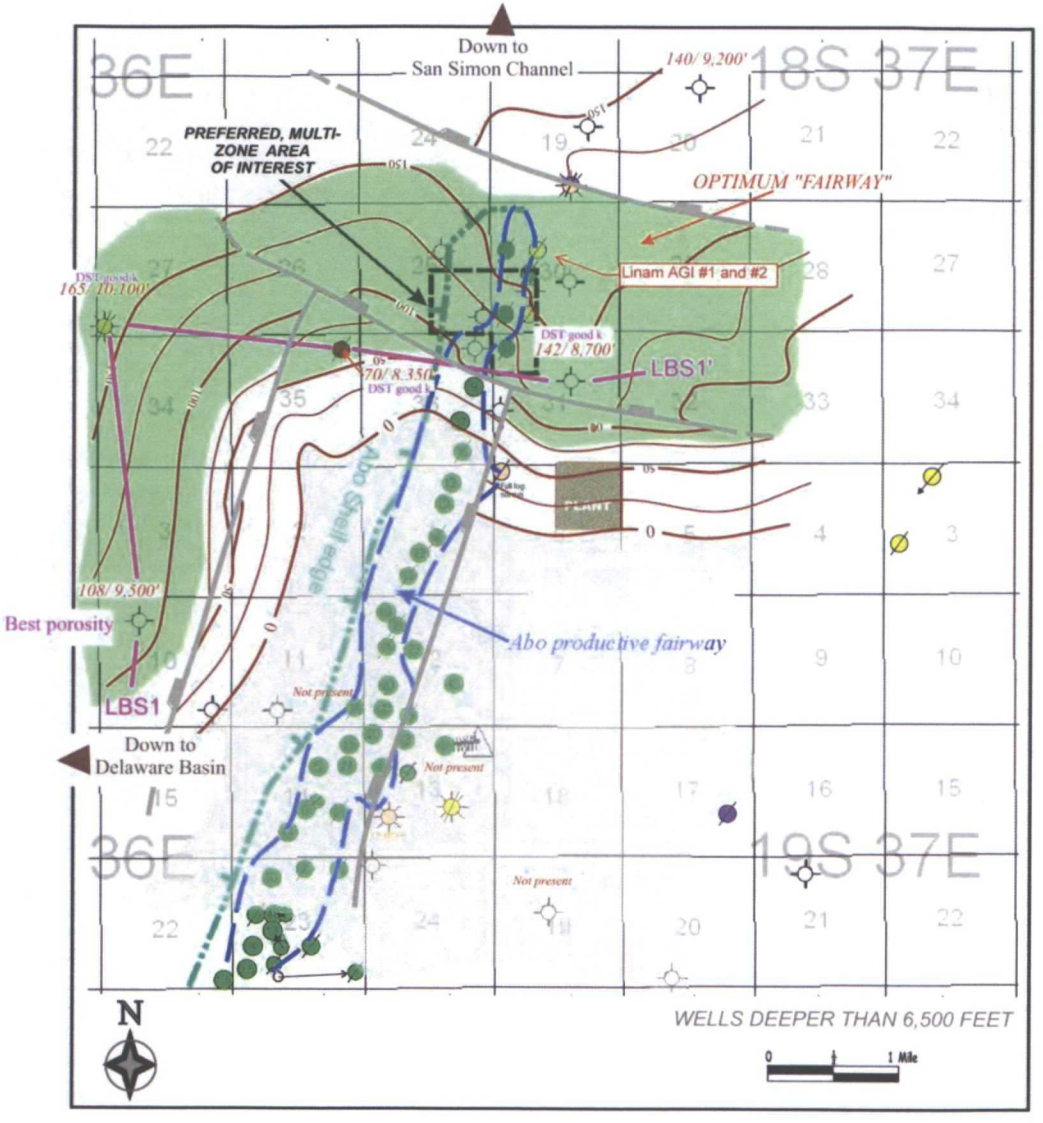
Figure 4: Regional Setting of Linam Plant and General Stratigraphy of the Northwest Side of the Central Platform

GEOLEX® INCORPORATED

dcp Midstream.

GEOLEX® INCORPORATED

Geologic Map of Area



Producing Zones:

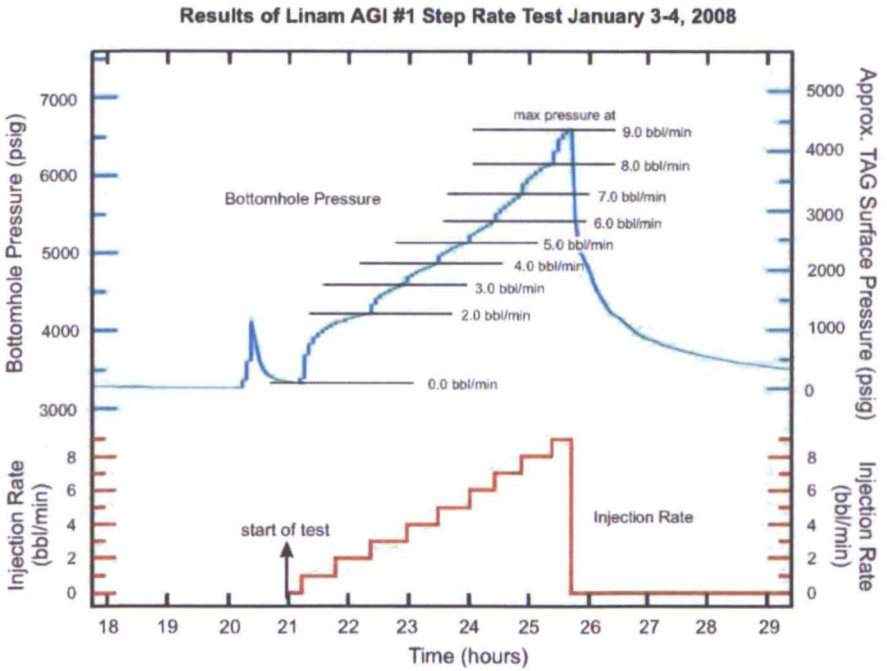
- Queen
- San Andres- Grayburg
- Upper Bone Spring
- Drinkard
- Abo, with current daily production (BOPD)

GEOLEX INCORPORATED

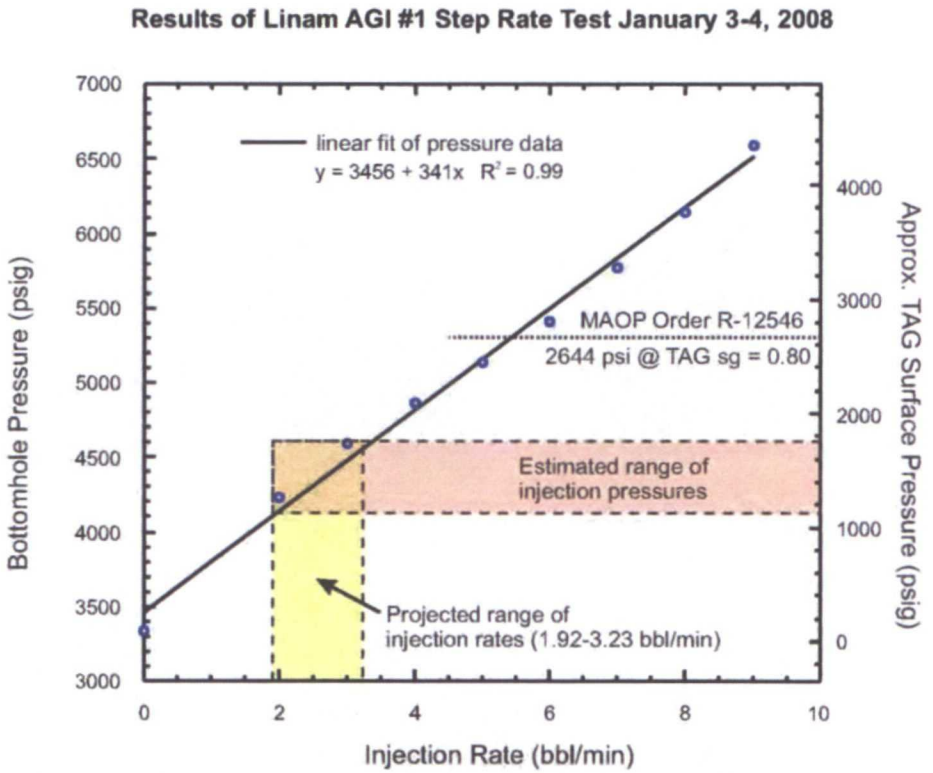
Lower Bone Springs Injection Reservoir Characteristics Derived from Linam AGI #1 Logging, Core Analysis and Operation

- Below Existing or Potential Oil/Gas Production
- Good Geologic Seal to Contain Gas
- Compatible Fluid Chemistry
- Isolated From Any Fresh Groundwater
- Laterally Extensive and Permeable (underpressured)
- 427 ft. thick available injection zone with gross net porosity of 25.6 ft (14ft net with Sw considered)
- 3 - 7MMCFD TAG injected into reservoir
- Radius of injection 0.47 mile over 30 years

Step Rate Test Performed in January 2008 Clearly Demonstrates that Original MAOP and Unlimited Injection Rate is Appropriate



Note: Approx. TAG Surface Pressure is calculated using the initial reservoir pressure (3262 psi) and the ave. specific gravity of TAG (0.69)



Note: Approx. TAG Surface Pressure is calculated using the initial reservoir pressure (3262 psi) and the ave. specific gravity of TAG (0.69)

GEOLEX INCORPORATED

Step Rate Test Results

- Step rate test conducted after completion of well in January 2008
- Step rate test supports safe injection pressures which are significantly higher than the 2644 MAOP in original order
- No breaks were detected in pressure curve at injection rates of up to TAG equivalents in excess of 20MMCFD

Pressure and Volume Injection Conditions under Current Assumptions

Table2: Pressure and Volume Calculations for TAG, Linam under Current Maximum Plant Capacity of 225 MMCFD and Measured Inlet Gas Concentrations

PROPOSED INJECTION STREAM CHARACTERISTICS

TAG	H_2S	CO_2	H_2S	CO_2	TAG
Gas vol MMSCFD	conc. mol %	conc. mol %	inject rate lb/day	inject rate lb/day	inject rate lb/day
7	18.4	81.6	122260	700156	822416

CONDITIONS AT WELL HEAD

Well Head Conditions		TAG							
Temp F	Pressure psi	Gas vol MMSCFD	Comp CO_2:H_2S	Inject Rate lb/day	Density[1] kg/m^3	SG[2]	density lb/gal	volume ft^3	volume bbl
104	1150	7	82:18	822416	339.96	0.34	2.84	38732	6898

CONDITIONS AT BOTTOM OF WELL

Injection Zone Conditions					TAG				
Temp F	Pressure[3] psi	$Depth_{top}$ ft	$Depth_{bottom}$ ft	Thickness[4] ft	Density[1] kg/m^3	SG[2]	density lb/gal	volume ft^3	volume bbl
104	3376	8710	9100	280.00	879.04	0.88	7.34	14979	2668

CONDITIONS IN RESERVOIR AT EQUILIBRIUM

Injection Reservoir Conditions					TAG				
Temp[5] F	Pressure[3] psi	Ave. Porosity[6] %	Swr	Porosity ft	Density[1] kg/m^3	SG[2]	density lb/gal	volume ft^3	volume bbl
124	3376	6.0	0.45	9.2	809.02	0.81	6.76	16276	2899

CONSTANTS

	SCF/mol	
Molar volume at STD	0.7915	
	g/mol	lb/mol
Molar weight of H_2S	34.0809	0.0751
Molar weight of CO_2	44.0096	0.0970
Molar weight of H_2O	18.015	0.0397

CALCULATION OF MAXIMUM INJECTION PRESSURE LIMITATION

SG_{TAG}	0.61
$PG = 0.2 + 0.433\ (1.04\text{-}SG_{TAG})$	0.386 psi/ft
IP_{max} = PG *Depth	3366 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

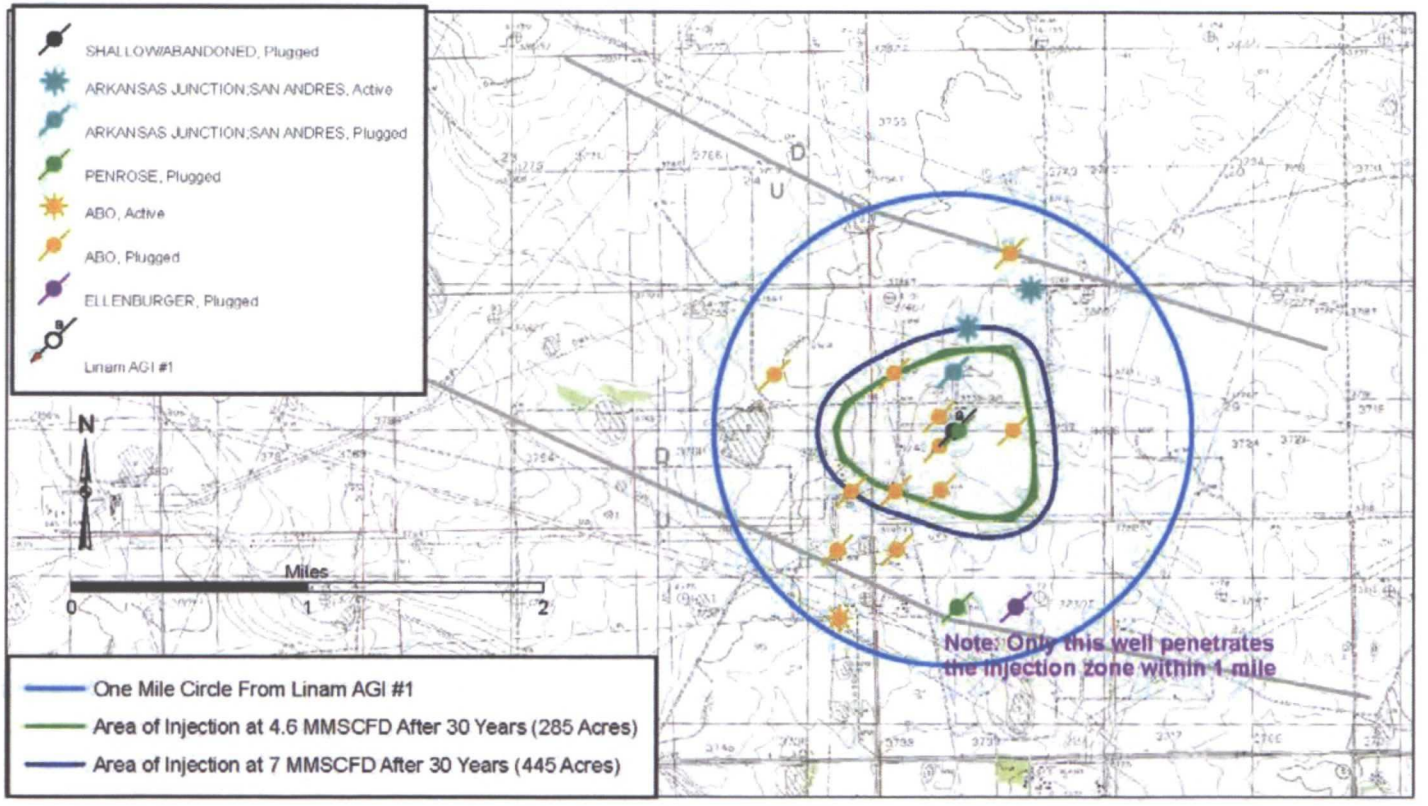
Cubic Feet/day (5.6146 ft^3/bbl)	16276 ft^3/day
Cubic Feet/30 years	178342498 ft^3/30 years
Area = V/Net Porosity (ft)	19360892 ft^2/30 years
Area = V/Net Porosity (ft) (43560 ft^2/acre	444.5 acres/30 years
Radius =	2482 ft
Radius =	0.47 miles

[1] Density calculated using AQUAlibrium software
[2] Specific gravity calculated assuming a constant density for water
[3] PP is taken from well tests of Linam AGI #1
[4] Thickness is the net thinckness of the perforated intervals
[5] Reservoir temp. is extrapolated from bottomhole temp. measured in logs
[6] Porosity is estimated using geophysical logs from nearby wells

Note that total Mass of H2S remains constant -- for this reason ROE in H2S Contingency Plan Remains the Same

GEOLEX INCORPORATED

Effect of Additional TAG Injection on Injection Zone



Original versus Planned Maximum Footprints of Injected TAG, Linam AGI #1

GEOLEX INCORPORATED

Injection Zone Summary

- The Lower Bone Springs Formation in Sec. 30, T18S, R37E is an excellent, safe, acid gas reservoir easily capable of containing planned volumes of acid gas without detrimental effects on oil, gas and groundwater resources in the area as demonstrated by installation and operation of Linam AGI #1
- The Lower Bone Springs injection reservoir has been demonstrated through Linam AGI #1 to be significantly more than adequate to receive the planned volume of TAG (7MMCFD) contained within a .47 mile radius of proposed Linam AGI #2)
- C-108 application provides details of redundant Linam AGI #2 justification based on real data from the installation and operation of NMOCC-approved Linam AGI #1
- The new well adds no additional capacity and is expected to operate exactly as the Linam AGI #1 does pursuant to NMOCC order R-12546 and its amendments.
- Linam AGI #2 also represents significant design and monitoring improvements over the existing Linam AGI #1

Oil and Gas Wells Located within a One-Mile Radius of Proposed Linam AGI #2

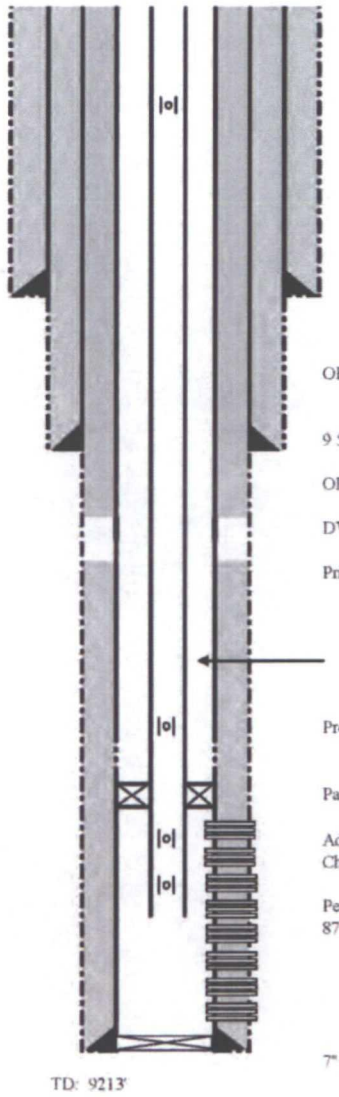
- Completion, testing and operation of Linam AGI #1 demonstrates that the Lower Bone Springs is the best available injection zone
- 19 Shallow Wells, Mostly P&A within the one-mile radius of proposed Linam AGI #2
  - All 19 well depths (810' to 8200') are well above the Lower Bone Springs injection zone (8,710'-9,085')
- Only 3 wells penetrate the Lower Bone Springs (see Slides 9, 10 and 11):
  - Goodwin #3 – TD 8,582 ft. – dry well – P&A
  - CONOCO-State #1 – TD 11,675 ft. – dry well – P&A
  - Linam AGI #1 – TD 9,213 – active acid gas injection

Linam AGI #1 Design and Current Condition

- 3 strings of Casing
  - 530’ Surface
  - 4212’ 9 5/8” J-55
  - 9137’ 7” L-80
- No corrosion resistant cement
- Packer set at 8650’
- Compromised casing from ~ 8550’ to packer
- 3 ½” L -80 tubing replaced 5/12
- SSSV, Tree inspected and in good condition

DCP LINAM AGI #1
WELLBORE SCHEMATIC

Location: 1980' FSL, 1980' FWL
STR 30-T18S-R37E
County, St.: LEA, NEW MEXICO



SURFACE CASING:
13 3/8", 48.00#/ft, H40, STC at 530'

INTERMEDIATE CASING:
9 5/8", 40.00#/ft, J55, LTC at 4212'

PRODUCTION CASING:
7", 26.00#/ft, L80, STC at 9200'
PBTD = 9137'

TUBING:
Subsurface Safety Valve at 250 ft
3 1/2", 9.2#/ft, L80, Hunting SLF at 8650'

PACKER:
Permanent Production Packer
Adjustable Choke
Check valve

PACKER FLUID (CORROSION INHIBITED):
Diesel w/ Cortron R-2525 (Corrosion inhibitor and oxygen scavenger)

PERFORATIONS:

Primary Target	Secondary Target
Lower Bone Springs	Brushy Canyon
8710' - 8730'	5000' to 5300'
8755' - 8765'	(Not perforated)
8780' - 8795'	
8780' - 8890'	
8925' - 8930'	
8945' - 8975'	
8985' - 9000'	
9045' - 9085'	

GEOLEX INCORPORATED

Lessons Learned from AGI #1 Operation and Workover

- Temperature control of TAG stream and consistent injection is critical to maintain phase stability and prevent free water in tubing
- Diesel filling annular space should be corrosion inhibited
- Improved materials in casing and tubing would provide additional protection against corrosion
- Corrosion primarily issue only in casing and tubing immediately above packer
- Improvements in AGI well design since 2005 should be incorporated in redundant well

Design Considerations and Elements

Casing and tubing material selection

Type of connections (VAM vs FJ)

SSSV and Packer Design and Selection

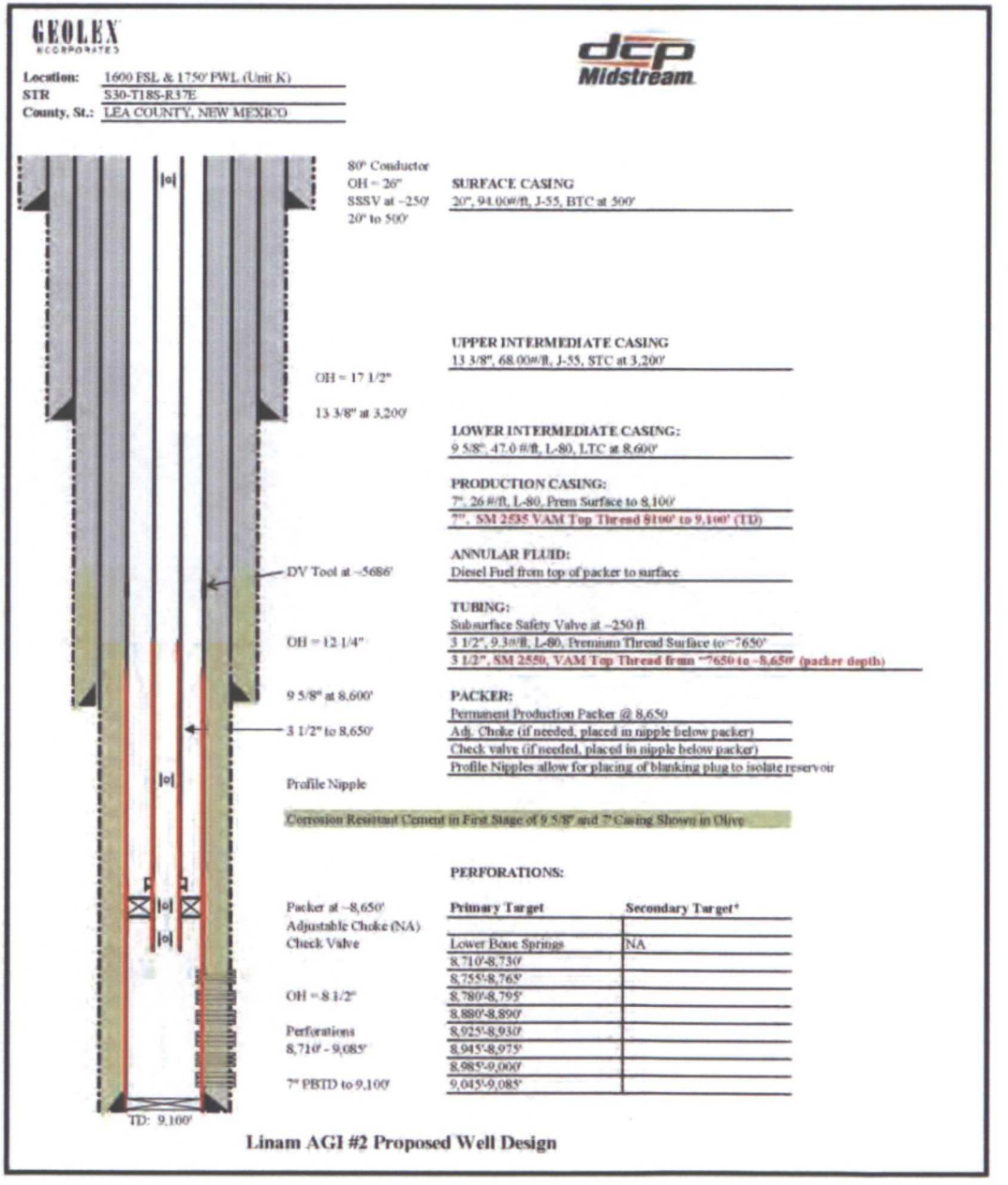
Christmas Tree Design and Specification

Desirability of downhole instrumentation for pressure and temperature monitoring

Surface facility design and well location implications

Linam AGI #2 Design

- *Note casing and tubular design and cement considerations*
- *Deep setting of 9 5/8" casing required to control well when drilling into existing reservoir*
- *Monitoring of downhole pressure and temperature via fiber optic*



Linam AGI #2 Proposed Well Design

GEOLEX INCORPORATED

Well Design and Geologic Setting Insures Protection of Groundwater

- Well Design
  - Groundwater protected by four (4) strings of casing each cemented to surface
  - Cement in injection zone and caprock will be corrosion resistant
  - Maximum depth of fresh groundwater in area less than 300'
- Geologic Features
  - Injection zone >8300' deeper than base of fresh water
  - Excellent caprock overlain by underpressured Brushy Canyon Formation

Water Wells in Vicinity of Linam AGI Wells

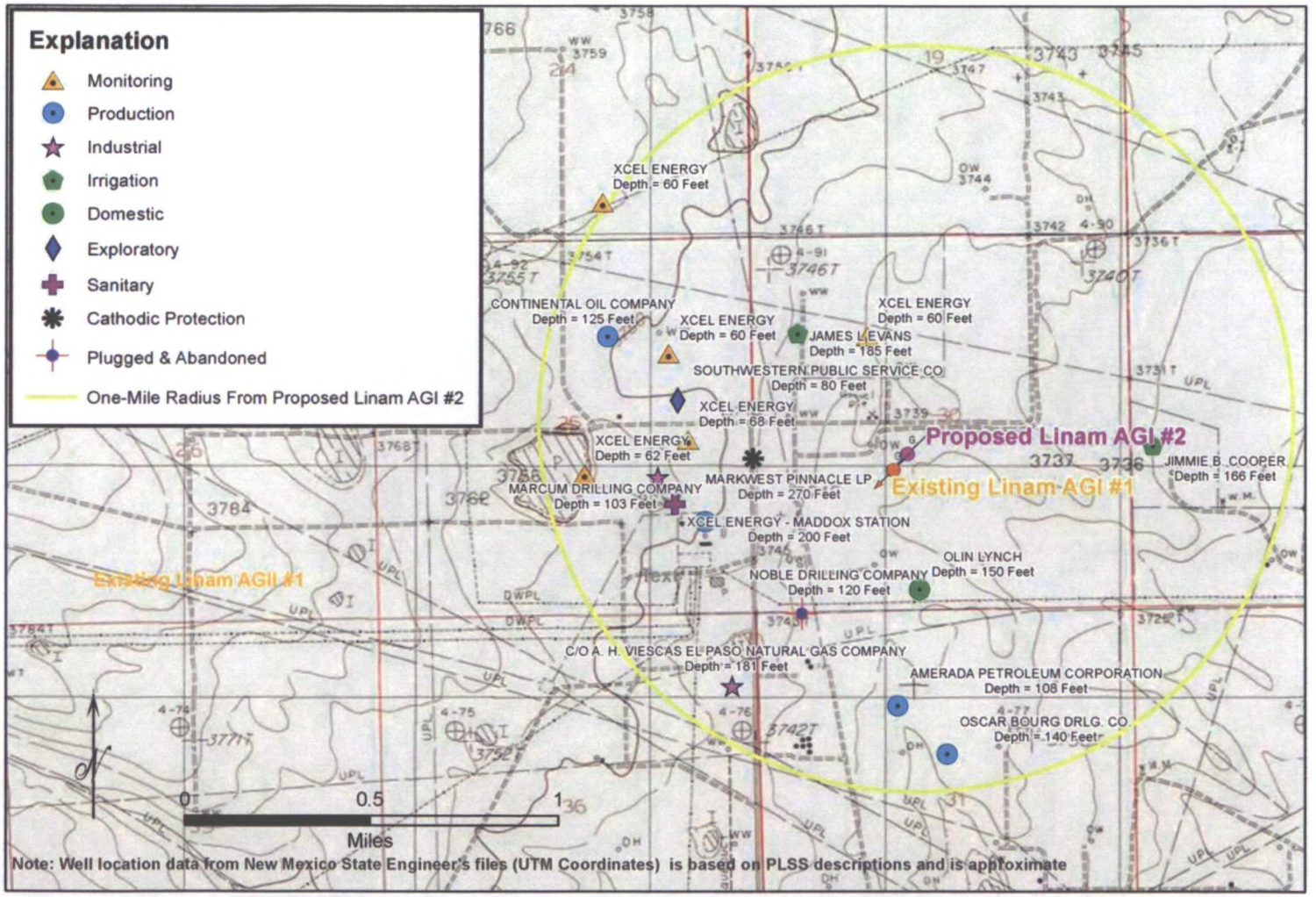


Figure 7: Identified Water Wells Within One Mile of Proposed Linam AGI #2

GEOLEX INCORPORATED

dcp Midstream

GEOLEX INCORPORATED

H_2S Contingency Plan Review

- No change in TAG composition or volume – Planned maximum 225 MMCFD throughput with 0.57 mole % H_2S in inlet gas CO_2 concentration does not affect ROE
- Results in 7 MMCFD of TAG with 82% CO_2 and 18% H_2S
- Results in 500ppm ROE of 4057 ft and 100ppm ROE of 8877 ft at plant
- Results in 500ppm ROE of 4073 ft and 100ppm ROE of 8914 ft at AGI site
- ROE will shift only slightly due to addition of second well when it is operating

ROE Map from H_2S Contingency Plan

GEOLEX
INCORPORATED

Summary of Environmental and Operational Benefits

- Significantly enhances protection for public by assuring safe and consistent system for acid gas disposal
- Significantly enhances reliability for producers by eliminating or minimizing unplanned shut-ins due to potential AGI well issues
- Improved design and downhole fiber optic pressure and temperature monitoring will assure better TAG control and reservoir analysis
- Linam AGI #2 will provide additional environmental and operational benefit by improving uptime and reliability
- H_2S is returned to geologic reservoir-no additional wastes generated
- Formerly-vented CO_2 is permanently sequestered reducing GHG emissions

Summary of DCP's Request

- DCP requests approval of the Linam AGI #2 as requested in our C-108 application
- DCP would like flexibility within Unit K Section 30 T18S R37E to locate well in optimum operational location relative to existing facilities
- Linam AGI #2 will provide additional environmental and operational benefit by improving uptime and reliability
- No change in injection zone, injection pressure or rate will result from the addition of new well
- DCP requests permission to inject into both wells simultaneously or independently as needed for operational flexibility
- MAOP of 2644 and unlimited injection rate of TAG is appropriate in this case
- DCP will revise H2S contingency plan when final location within Unit K is selected but ROE will not change due to no increase in H2S concentration in inlet gas