## STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION COMMISSION

## APPLICATION OF TARGA MIDSTREAM SERVICES, LLC FOR AUTHORIZATION TO INJECT, LEA COUNTY, NEW MEXICO.

**CASE NO. 24594** 

## TARGA MIDSTREAM SERVICES, LLC'S EXHIBIT INDEX

Exhibit A	Hearing Application and Form C-108
Exhibit B	Hearing Presentation
Exhibit C	Self-Affirmed Notice Statement of Dana S. Hardy
C-1	Notice Letter to Affected Parties
C-2	Chart of Notice to Affected Parties
C-3	Copies of Certified Mail Receipts

## STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION COMMISSION

## APPLICATION OF TARGA MIDSTREAM SERVICES, LLC FOR AUTHORIZATION TO INJECT, LEA COUNTY, NEW MEXICO.

CASE NO. 24594

#### TARGA MIDSTREAM SERVICES, LLC'S <u>APPLICATION FOR AUTHORIZATION TO INJECT</u>

In accordance with 19.15.26 NMAC, Targa Midstream Services, LLC ("Targa") (OGRID No. 24650) seeks authorization to inject treated acid gas ("TAG") from its Copperhead Gas Processing ("Plant") into the proposed Copperhead AGI No. 1 Well ("Well"), to be located in Section 13, Township 24 South, Range 32 East, Lea County, New Mexico. In support of this Application, Targa states the following.

1. The Well is an Underground Injection Control ("UIC") Class II well subject to the requirements of 19.15.26 NMAC.

2. The Well will be drilled as a vertical well with a surface location approximately 793 feet from the south line (FSL) and 429 feet from the east line (FEL) of Section 13.

3. The Well will inject TAG into the Devonian Thirtyone, Upper Silurian Wristen, and Lower Silurian Fusselman Formations at a depth of approximately 17,299 feet to 18,689 feet.

4. The Well's maximum daily injection rate will be 26 million standard cubic feet per day ("MMSCFD").

5. The Well's maximum surface injection pressure will be approximately 3,460 pounds per square inch gauge ("psig").

6. The surface location of the Well is within the Plant's boundary.

Targa Midstream Services, LLC Case No. 24594 Exhibit A 7. The complete C-108 for the Well is attached to this application as Exhibit A.

8. The Well will allow Targa to serve operators in the area and avoid cessation of production.

9. Targa's request for authorization to inject TAG into the Well will prevent waste, protect correlative rights, and protect human health and the environment.

WHEREFORE, Targa requests that this application be set for hearing before the Commission on the next available docket, and, after notice and hearing as required by law, the Commission enter an order approving Targa's C-108 application for authorization to inject.

Respectfully submitted,

#### HINKLE SHANOR LLP

<u>/s/ Dana S. Hardy</u> Dana S. Hardy Jaclyn McLean P.O. Box 2068 Santa Fe, NM 87504-2068 Phone: (505) 982-4554 Facsimile: (505) 982-8623 dhardy@hinklelawfirm.com jmclean@hinklelawfirm.com *Counsel for Targa Midstream Services, LLC*  Recei

.

ved by	CD: 8/8/2024-3:59815-PM
ENE	OF NEW MEXICOOil Conservation DivisionFORM C-108GY, MINERALS AND NATURAL1220 South St. Francis Dr.Revised June 10, 2003JRCES DEPARTMENTSanta Fe, New Mexico 87505
	APPLICATION FOR AUTHORIZATION TO INJECT
I.	URPOSE:Secondary RecoveryPressure Maintenance X DisposalStorage pplication qualifies for administrative approval?Yes X No
II.	PERATOR: Targa Midstream Services, LLC
	DDRESS: 811 Louisiana Street, Houston, TX 77002
	ONTACT PARTY:PHONE:
III.	ELL 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. See Attached Narrative
IV.	this an expansion of an existing project?YesYesNo Yes, give the Division order number authorizing the project:
V.	ttach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle rawn around each proposed injection well. This circle identifies the well's area of review. See Narrative, Section V
VI.	ttach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Suc ata shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schemati f any plugged well illustrating all plugging detail. No wells penetrate proposed injection zone, see also Section V,
VII.	ttach data on the proposed operation, including:
	<ul> <li>Proposed average and maximum daily rate and volume of fluids to be injected;</li> <li>Whether the system is open or closed;</li> <li>Proposed average and maximum injection pressure;</li> <li>Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,</li> <li>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.).</li> </ul>
*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 lissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known t be immediately underlying the injection interval. See Narrative, Section VIII
IX.	escribe the proposed stimulation program, if any. See Narrative, Section IX
*X.	ttach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted)
*XI.	ttach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any jection or disposal well showing location of wells and dates samples were taken. See Narrative, Section XI
XII.	Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering dat nd find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources o lrinking water. See Narrative Section XII
XIII.	pplicants must complete the "Proof of Notice" section on the reverse side of this form.
XIV.	ertification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge an lief.
	AME:
	IGNATURE:
*	-MAIL ADDRESS: JOxford@targaresources.com the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted.

Please show the date and circumstances of the earlier submittal:

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate District Office

Side 2

#### 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. See Narrative, Section III A 1
  - (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 Narrative, Section III A 2
  - (3) A description of the tubing to be used including its size, lining material, and setting depth. See Narrative, Section III A 3
  - (4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used. Halliburton 7" Nickel Alloy Permanent Packer set at 17,250', Section III A 4

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. Also in Narrative, Section III B, 1-5
  - (1) The name of the injection formation and, if applicable, the field or pool name.
  - **Devonian Formation, Devonian AGI** (2) The injection interval and whether it is perforated or open-hole.
  - Open hole completion 17299 to 18699 for a total of 1400'
  - (3) State if the well was drilled for injection or, if not, the original purpose of the well. Well to be drilled for injection of TAG
  - (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.
  - NA (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.
    - Atoka/Morrow gas zones above (~14420-16,500'), no deeper producing horizons.

#### XIV. PROOF OF NOTICE

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

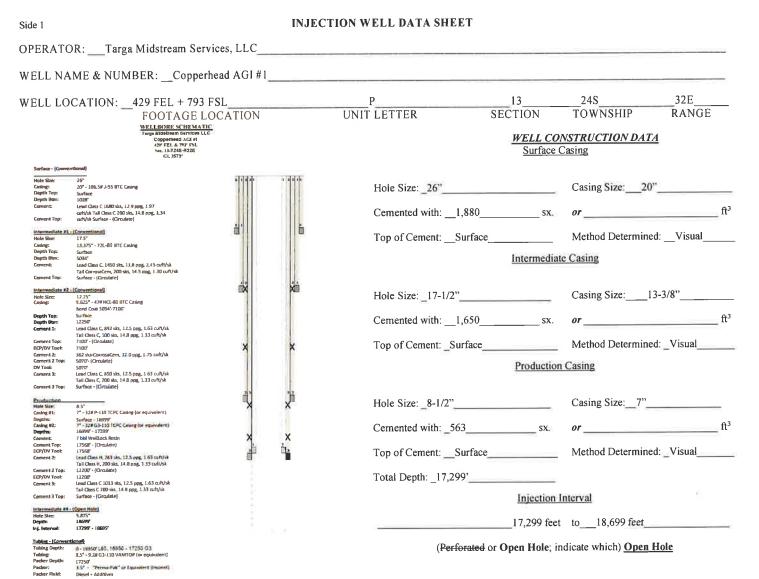
Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

- (1) The name, address, phone number, and contact party for the applicant;
- (2) The intended purpose of the injection well; with the exact location of single wells or the Section, Township, and Range location of multiple wells;
- (3) The formation name and depth with expected maximum injection rates and pressures; and,

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

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

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

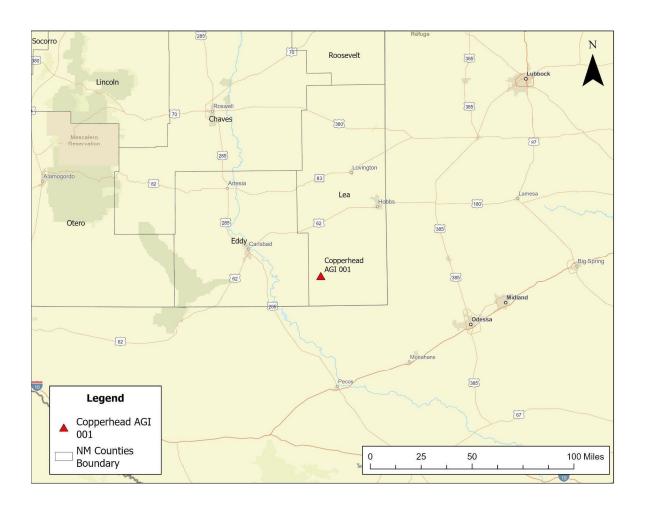


Side 2

## **INJECTION WELL DATA SHEET**

Tubing Size	e:	
	Тур	e of Packer: _Halliburton 7" Permanent Packer
	Pacl	cer Setting Depth: _17,250'
	Oth	er Type of Tubing/Casing Seal (if applicable):
		Additional Data
	1.	Is this a new well drilled for injection?YesNo
		If no, for what purpose was the well originally drilled?
	2.	Name of the Injection Formation: _Devonian
		Name of Field or Pool (if applicable): _AGI - Devonian
	4.	Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail, i.e. sacks of cement or plug(s) usedNo
		Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area:
		Atoka / Morrow 14,419' – 15,784'

Application for Copperhead Acid Gas Injection Well Targa Midstream Services LLC Copperhead AGI #001 Section 13 T24S, R33E Lea County, New Mexico



Prepared for: Targa Midstream Services LLC, 811 Louisiana St, Houston TX 77002 Prepared by: New Mexico Tech Petroleum Recovery Research Center, 801 Leroy Place, Socorro NM May 24, 2024

Introduction	.3
I. Well Purpose	.3
II. Operator Information	.3
III. Well Data	.3
IV. Expansion of existing project	.7
V. Lease and well maps (See Attachment 3 Also)	.8
VI. Tabulation of wells (See Attachment 3 for Complete Well List)	.9
VII. Data on proposed operation1	10
VIII. Geologic Description and Data1	12
IX. Proposed stimulation program1	16
X. Logging and Test Data1	16
XI. Ground Water1	17
XI. Ground Water	
	19
XII. No Hydrologic Connection Statement1	19 19
XII. No Hydrologic Connection Statement1 XIII. Proof of Notice	19 19 20
XII. No Hydrologic Connection Statement	19 19 20 21
XII. No Hydrologic Connection Statement       1         XIII. Proof of Notice       1         Attachment 1: C-102 Well Location and Acreage Dedication Plat       2         Attachment 2: Wellbore Diagram       2	19 19 20 21 22
XII. No Hydrologic Connection Statement       1         XIII. Proof of Notice       1         Attachment 1: C-102 Well Location and Acreage Dedication Plat       2         Attachment 2: Wellbore Diagram       2         Attachment 3: Well and Lease maps       2	19 19 20 21 22 48
XII. No Hydrologic Connection Statement       1         XIII. Proof of Notice       1         Attachment 1: C-102 Well Location and Acreage Dedication Plat       2         Attachment 2: Wellbore Diagram       2         Attachment 3: Well and Lease maps       2         Attachment IV – Reservoir Modeling       4	19 19 20 21 22 48 48
XII. No Hydrologic Connection Statement       1         XIII. Proof of Notice       1         Attachment 1: C-102 Well Location and Acreage Dedication Plat       2         Attachment 2: Wellbore Diagram       2         Attachment 3: Well and Lease maps       2         Attachment IV – Reservoir Modeling       4         Reservoir Modeling       4	19 19 20 21 22 48 48 52

## INTRODUCTION

The following document and attachments support the attached C-108 form for the proposed well Copperhead AGI #001. The narrative sections below align with the structure of the C-108 form.

## I. WELL PURPOSE

The well will be utilized to dispose of treated acid gas (TAG) from the adjacent Copperhead Gas Processing Plant. The Copperhead AGI #001 will be drilled at a location 793 FSL feet from the north line (FNL) and 429 feet from the east line (FEL) of Section 13 T24S, R32E (**Attachment 1**). The Copperhead AGI #001 well will be drilled vertically to an approximate depth of 18,699' as a Class II acid gas injection well. The well will be completed open hole and will inject into the Devonian Thirtyone Formation, Upper Silurian Wristen Group and the Lower Silurian Fusselman Formation, at a depth of ~17,299 – 18,689 feet. The well is designed to safely sequester acid gas injectate at a rate of 26.0 million standard cubic feet per day (MMSCFD) at an approximate surface pressure not to exceed 3,460 psig.

## **II. OPERATOR INFORMATION**

The operator of the well will be Targa Midstream Services, LLC, a subsidiary of Targa Resources Corp.

## III. WELL DATA

#### C-108 SECTION A

## 1. General Well Information (See Attachment 1 for C-102)

Lease name and Well Number: Copperhead AGI #001 Legal location and footage: P-13-T24S-R32E, 793' FSL, 429' FEL Acreage: 40.03 Lat/Long: 32°12'45.39" N/ 103°37'16.30" W Geodetic Coords: X = 761583.3, Y = 441810.7, NAD 83 NME Elevation: 3,579' Proposed Injection Unit and Depth: Siluro-Devonian, ~17,299 – 18,689 Operator (OGRID): Targa Midstream Services LLC (24650) - a subsidiary of Targa Resources County: Lea County, NM

## 2. Casing/Cement Information (See Attachment 2 for Wellbore Diagram)

The preliminary casing design is presented in **Table 1**, and casing specifications are provided in **Table 2**. The well will have four strings of the telescoping casing. All four of the casing strings will be cemented to the surface. 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. The casing setting depth shall be calculated to position the casing seat opposite a competent formation which will contain the maximum pressure to which it will be exposed during normal drilling operations<del>.</del> 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 that have been previously approved by the New Mexico Oil Conservation Commission (NMOCC) for acid gas injection.

#### Table 1. Casing Design

Casing/ Tubing String	Casing /Tubing Depth, TVD1, ft	Borehole Diameter, in.	Casing / Tubing Outside Diameter, in	Coupling/ Connection	Casing/Tubing Material (Weight /Grade)	String Weight in Air, Ib
Conductor	0-100	30	24	Welded	118 lb/ft, J-55	11,800
Surface	0-1,208	26	20	втс	106.5 lb/ft, J-55	128,652
Intermediate #1	0-5,034	17 1/2	13 3/8	BTC	72 lb/ft, L-80	362,448
Intermediate #2	0-12,250	12 1/4	9 5/8	BTC Bond coat 5,084'- 7,100'	47 lb/ft, L-80	575,750
Long String	0-17,299	8 5/8	7	Prem FJ	32 lb/ft, Cr1 & - P110	553,568
Open hole	17,299- 18,700'	5 7/8	N/A	N/A	N/A	N/A
Tubing	0-17,295'	N/A	3 1/2	VAM	9.2 lb/ft, L-80 & 300' G3 on bottom	158,700

#### Table 2. Casing Specifications

Casing / Tubing String	Casing / Tubing Material (Weight / Grade / Connection)	Casing/ Tubing Diameters (OD/ID/ Drift), in.	Yield, (ksi)	Tensile (ksi)	Internal (Burst) Yield, psi	Collapse (psi)	Body Yield, (1,000 Ibs)	Joint Strength, 1,000 lbs
Surface	106.5 lb/ft, J-55, BTC	20/19/ 18.812	55	75	2,410	770	1,685	1,595

.

Inter- mediate #1	72 lb/ft, L- 80, BTC	13.375/12.347/12. 191	80	95	5,380	2,670	1,661	1,650
Inter- mediate #2	47 lb/ft, L- 80, BTC	9.625/ 8.681/ 8.525	80	95	6,870	4,760	1,086	1,122
Long String	32 lb/ft, Cr13-P110, Prem FJ	7.000/ 6.094/ 5.969	110	125	11,640	10,780	1,025	1,053
Tubing	9.2 lb/ft, VAM TOP/G3	3.500/ 2.992/ 2.867	80	95	10,160	10,540	207	168

**Table 3** summarizes cement design specifications. Top plugs shall be used to reduce contamination of cement by displacement fluid. A bottom plug or other acceptable technique, such as a pre-flush fluid, inner string cement method, etc. shall be utilized to help isolate the cement from contamination by the mud fluid being displaced ahead of the cement slurry.

Actual volumes will be calculated and determined by conditions onsite. All cement slurries will meet or exceed minimum BLM and New Mexico Oil Conservation Division requirements. The slurries listed above or equivalent slurries will be used depending on the service provider selected. Cement yields may change depending on the type of slurries selected.

Cement shall be allowed adequate curing time to achieve a minimum of 500 psi compressive strength at the casing shoe prior to drilling out.

Nickel Alloy casing will be the bottom 300' of the 7" casing for corrosion resistance and will be cemented with corrosion resistant cement.

Casing	Depth (ft)	Cement Volume (sacks)	Cement Type & Yield	Designed TOC	Centralizers
Conductor	100	82	Type I Neat 14.8 ppg	Surface cement circulated	None

Surface	1,208'	100% open hole excess 1,680 sks lead, 200 sks tail. Volume verified with fluid caliper	Lead Class C + 2% CaCl2 + 0.25Ibl/sk Cello Flake + 0.2% FL, 12.9 ppg, 1.97 cuft/sk. Tail 200 sk Class C 14.8 ppg, 1.34 cuft/sk Circulate	Surface Cement Circulated	1 per joint on bottom 3 joints
Inter- 5,034' mediate #1		75% open hole excess Lead: 1,400 sks, Tail: 200 sks CorrasaCem Volume verified with fluid caliper	Lead: Class C Cmt + 3% CaCl + 0.25lb/sk CelloFlake + 5lb/sk LCM, 11.8 ppg 2.453 cuft/sk Tail: CorrosaCem Cmt, 14.5ppg 1.38 cuft/sk	Surface Cement Circulated	1 per joint for bottom 3 joints, 1 on every 3 joints for remaining joints
Inter- mediate #2	12,250'	75% open hole excess <b>STAGE 1</b> Lead: 892 sks Tail: 100 sks <b>STAGE 2</b> Lead:362 sks CorrosaCem <b>STAGE 3</b> Lead: 850 sks Tail: 200 sks	<b>STG 1</b> Lead: Class C Cmt,12.5 ppg, 1.63 cuft/sk Tail:Class C Cmt 14.82 ppg, 1.32 cuft/sk <b>STG 2</b> : CorrosaCem, 12.0 ppg, 1.75 cuft/sk <b>STG 3</b> : Lead Class C, 12.5 ppg, 1.63 cuft/sk Tail: Class C, 14.8 ppg, 1.32 cuft/sk	Surface Cement Circulated	1 per joint for bottom 3 joints, 1 on every 3 joints for remaining joints
Production	17299'	75% open hole excess <b>STAGE 1</b> 7 BBLS WELLLOCK CMT <b>STAGE 2</b> Lead 263 sks Tail 200 sks Volume verified with caliper	STG 1 WELL LOCK RESIN STG 2 Lead Class H cement, 12.5 ppg, 1.63 cuft/sk Tail: 200 sks cement, 15.6 ppg, 1. cuft/sk	Surface	1 every 3 joints for remaining joints

.

## 3. Tubing Information

The tubing is 3 ½" L80 9.2 lb/ft tubing with a Premium Gas Tight Thread from the surface to 16,950' and then 300' of G3 Nickel Alloy 9.2 lb/ft tubing with Vam Top Gas Tight Threads (16,950' -17,250') connected to the Inconel Permanent Production Packer. G3 Nickel alloy tubing is a highly corrosion resistant material. An Inconel SubSurface Safety Valve will be installed in the tubing at 100' to 150'. Bottom hole pressure and temperature gauges will be attached to the permanent packer via fiber optic line attached to the outside of the tubing.

#### 4. Packer Information

Halliburton 7" Nickel Alloy Permanent Packer set at 17,295'. The casing annulus will be filled with a corrosion resistant packer fluid consisting of diesel and corrosion inhibitors.

#### **Drilling Fluids Design**

The anticipated bottom hole pressure is ~8,000 psi. No abnormal pressure or temperatures are anticipated; however, there will be sufficient mud on location to control a blowout should one occur. Managed Pressure Drilling Systems will be installed on the rig and operated to control abnormal pressure events. Mud flow and volume will be monitored both visually and with electronic pit volume totalizers. Mud tests shall be performed every 24 hours after mudding up to determine, as applicable: density, viscosity, gel strength, filtration, and pH. The mud program may be revised at the recommendation of the field engineer.

A closed-loop system will be used to recover drilling fluid and dry cuttings in both phases of the well and on all hole intervals, including fresh water and oil-based operations. Above-ground tanks will be utilized to hold cuttings and fluids for rig operations. A frac tank will be on location to store fresh water. Waste will be disposed of properly at an EPA-approved hazardous waste facility. Fresh water cuttings will be disposed of by the service from the company.

#### C 108 SECTION III B

- 1. Name of injection formation: AGI Devonian
- 2. Injection interval: Open hole 17,299' 18,699'
- 3. Original well purpose: Drilled for Acid Gas Injection
- 4. Depths of any other perforated intervals: No other perforated intervals
- 5. Depths and names of next higher and lower oil/gas zones in well area: Atoka/Morrow gas zones above (~14,420—16,500'), no deeper producing horizons.

The proposed Copperhead AGI #001 well will be drilled for the purpose of injecting TAG into the Silurian/Devonian formations at a depth of 17,299' - 18,699'. No production or injection wells in the area penetrate these formations, nor is there production from any deeper zones. The nearest wells in the vicinity produce primarily from the Bone Spring and Wolfcamp formations. There are also three active gas wells in the Atoka (**Figure 1**). **Table 4** provides a summary of wells.

#### IV. EXPANSION OF EXISTING PROJECT

This is NOT an expansion of an existing project.

## V. LEASE AND WELL MAPS (SEE ATTACHMENT 3 ALSO)

The following maps are provided in accordance with NMOCD requirements. See **Table 3-1** in **Attachment 3** for tabular listings of wells, operators, and owners, as well as more details on land and leases.

- 2-mile, 1-mile and ½-mile radius Oil & Gas Well Map (Figure 1, Figure 3-1)
- 2-mile radius Surface Ownership Map (Figure 2, Figure 2-2)

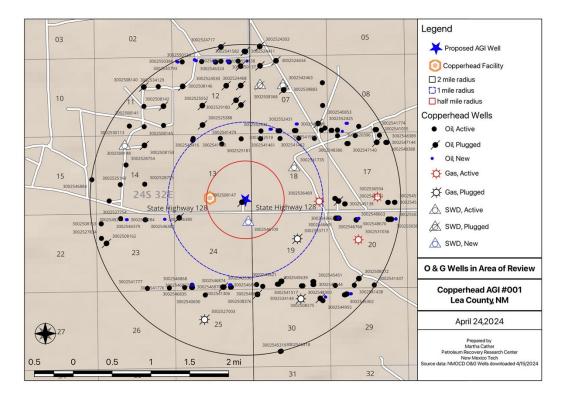


Figure 1. Wells within 1/2-, 1- and 2-mile radius of proposed Copperhead AGI #001

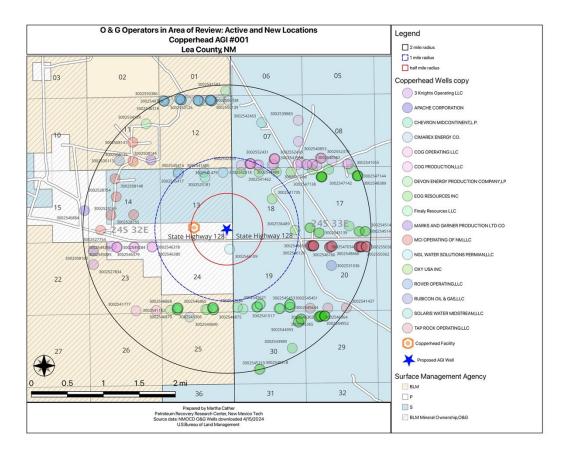


Figure 2. Operators and surface ownership for wells within 1/2-, 1- and 2-mile radius of proposed Copperhead AGI #001

## VI. TABULATION OF WELLS (SEE ATTACHMENT 3 FOR COMPLETE WELL LIST)

**Table 4** provides a list and details regarding wells within a 1-mile radius of the proposed location. There are no other injection or production wells penetrating the proposed injection within a 2-mile radius of the proposed location.

Well API	Well Name	Well Type	Formation	Well Status	Operator	Spud	Plug	Notes
3002508147	WOOLLEY #001	Oil	Brushy Canyon	Plugged (site released)	Westates Petroleum Corp of Texas	1957	1957	DH 1957, TD Delaware 5063'
3002546109	MCCLOY CENTRAL SWD #001	SWD	Devonian- Silurian	New	NGL Water Solutions Permian,LLC	NA	NA	APD filed 6/13/2019, <b>expired</b> 6/13/2021

There are 237 well locations (active, plugged, or new) within 2 miles of the proposed well, with 2 wells located (**Table 4**) within a ½ mile radius. The Woolley #001 (API# 30-025-08147) was drilled in 1957 to a depth of 5,063 feet into Delaware Mountain Group sands and plugged that same year. Forms C-101 and

102 were filed for a SWD well in 2017 (30-025-46109), but the permits expired in 2019 and no further action has been taken. Over 90% of the wells within the 2-mile radius are oil wells drilled to either Bone Spring (83) or Wolfcamp (46) reservoirs. The remainder are drilled to the Delaware or Atoka/Morrow. No wells produce from the proposed injection zone anywhere within the 2-mile radius. **Table 5** provides a general summary of wells in the area.

Radius distance from location (mi)	Active	New/Never Drilled	Plugged, site released	Total
½-mile	0	1	1	2
1-mile	10	4	2	16
Two	134	56	29	219
Total	144	61	32	237

#### Table 5. Summary of wells within 2 miles of Copperhead AGI #001

#### VII. DATA ON PROPOSED OPERATION

(Items 1-3) A closed system will be used. Average and maximum rates and pressures are shown in **Table 6**. Equations, calculations, and modeling results are provided in **Attachment IV**.

Table 6. Average and maximum injection rates and pressures

Injection rate, MMSCFD	Average BHP, psi	Max BHP, psi	Average WHP, psi	Max WHP, psi	
12	12 6,880		1,551	1,663	
26	7,353	9,094	2,476	3,101	

(4) Source of injection fluid is TAG from Copperhead facility with a composition of 30% H<sub>2</sub>S, 70% CO<sub>2</sub>

(5) **Injection formation water analysis**: The proposed well will inject TAG into the Siluro-Devonian interval. Water data was retrieved from the U.S. Geological Survey National Produced Waters Geochemical Database v2.3 (05/22/2019) to determine formation chemistry in the Siluro-Devonian injection interval for the Copperhead AGI #1 well. Water samples from the Devonian have been collected from 3 wells located within 11 miles of the proposed injection well. Those analyses show that the water contains NaCl and concentrations of total dissolved solids (TDS) range from 71,078 to 120,326 mg/L with an average of 90,530 mg/L (**Table 7, Figure 3**). High salinity indicates this interval is compatible with injection.

API	Form	HCO₃	Са	Mg	Na	К	CI	SO <sub>4</sub>	TDS
3001510859	Devonian	427	6280	586	38393	1070	73100	470	120326
3002508483	Devonian	500	2400	329	24039	610	42200	1000	71078
3002521082	Devonian	476	2820	378	27076	637	47900	900	80187

Table 7. Wells with water chemistry (mg/L) in the Devonian near the Copperhead AGI #2 well

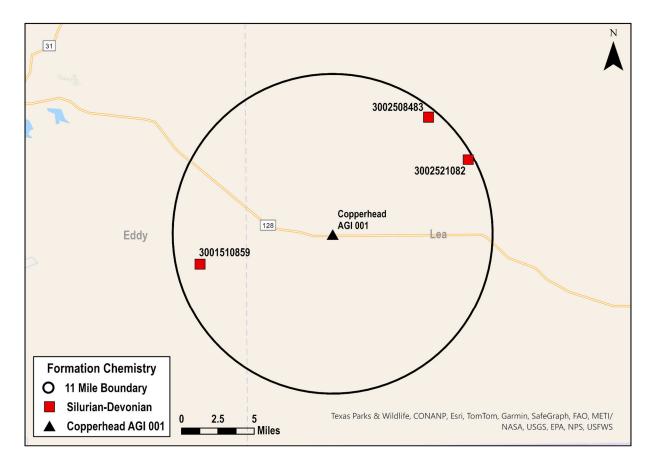


Figure 3. Wells with water chemistry (mg/L) in the Devonian within 11 miles of the Copperhead AGI #1 well from the USGS National Produced Waters Geochemical Database. Data show these formations are NaCl waters with average TDS of 90,530 mg/L.

## VIII. GEOLOGIC DESCRIPTION AND DATA

**Table 8** lists formations, depths and thicknesses. The subsurface geology is composed of a very thick sequence of sedimentary rocks including evaporites, carbonates, sandstones and shales representing a variety of depositional environments, underlain by Precambrian bedrock. Details of injection and confining zones are given below.

#### Table 8. Formation tops, depths, and thicknesses

	Measured Depth	Thickness	Porosity (%)	Permeability (md)	Behavior
Rustler	1155	346			Seal*
Salado	1501	1288			Seal*
Castile	2789	2185			Seal*
Lamar	4974	50			
Bell Canyon	5024	1028			Injection zone*
Cherry Canyon	6052	1627			Injection zone*
Brushy Canyon	7679	1265			
Bone Spring	8944	3255			
Wolfcamp	12199	1880			
Strawn	14079	340			
Atoka	14419	1365			
Morrow	15784	745			
Barnett Shale	16529	253	1.00%	0.1	Seal
Mississippian Ls	16782	392	1.50%	0.1	Seal
Woodford Sh	17174	125	1.00%	0.04	Seal
Thirtyone Fm	17299	890	2.20%	1.5	Injection zone
Wristen Gp			3.50%	6	Injection zone
Fusselman	18189	500	4.00%	2	Injection
Montoya	18689	80	2.00%	1	Seal
Simpson shales	18769	1615	1.00%	0.6	Seal
Ellenburger Dolomite	20384	550	1.50%	0.01	Seal
Ground elevation	3579				
*not proposed for injection at this location					

#### INJECTION ZONE

The injection zone encompasses the rocks of the Ordovician, Silurian, and Devonian age including the Fusselman, Thirtyone and Wristen strata; at depths of ~17,299-18,689 feet. The total thickness of the injection interval is estimated to be ~ 1,390 feet (**Table 8**).

#### **Ordovician – Silurian**

**Fusselman Formation** – The Fusselman Formation is a shallow-water carbonate system. In the Copperhead area, it is around 500' thick. Although these shallow water carbonates initially had fairly high primary porosity, diagenesis usually has decreased both the porosity and permeability unless impacted by exposure and dissolution. Based on area well logs, the porosity averages around 1-2%, but some zones may have higher porosity based on regional well logs and injection well data. Reported permeability for shallower sections range from 0.001 to 10 mD (Ruppel, 2019).

#### Lower Devonian – Silurian

**Thirtyone and Wristen Formations** – Underlying the Woodford Shale are the interbedded dolomites and dolomitic limestones of the Devonian Thirtyone Formation and the Silurian Wristen Group, collectively referred to as the Siluro-Devonian section (~890 ft thick). Unlike the Fusselman, Montoya and Ellenburger carbonates, these deposits represent deposition in deeper waters in the Copperhead area. Porosity and permeability in the Wristen are limited in the main body of the unit (3-5%), but exposure events and carbonate dissolution can improve the porosity (~5%). Within Thirtyone deposits, the chertrich deposits have the best porosity (up to 40%, up to 80 mD), while the limestones have less than 7% porosity and less than 1 mD of permeability (**Table 8**; Ruppel et al., 2020a).

#### UPPER CONFINING ZONE PROPERTIES: WOODFORD SHALE/MISSISPPIAN LIMESTONE

**Mississippian** – Mississippian age deposits are commonly divided (from youngest to oldest) into the Barnett Shale and the Mississippian limestone (an un-named unit) of Lower Mississippian age. The Mississippian section is approximately 392 ft thick in the Copperhead area and is regionally extensive. Known production from this limestone consists of one to two well plays that normally have poor porosity (4-9%) and permeability (Broadhead, 2017) in New Mexico and a few isolated fields in the shallow water, high-energy limestones in Texas. The Barnett Shale is a widespread, dark, organic shale with very low porosity and permeability and is ~250 ft thick.

**Upper Devonian** – Within the Permian Basin, the Upper Devonian Woodford Shale serves as a seal to hydrocarbon migration out of Devonian and older units (Wright, 1979). In combination with the Mississippian section, it makes an excellent seal for potential injection. The Woodford Shale is ~125 ft thick in the Copperhead area and is laterally continuous, organic- and shale-rich, siliceous (radiolarians) mudstone. Although porosity can be as high as 10% (Jarvie et al., 2001), it averages around 1% with very low permeabilities.

#### LOWER CONFINING ZONE PROPERTIES: ORDOVICIAN TO PRECAMBRIAN

**Simpson Group** – The Simpson Group is a thick sequence of carbonates, sandstones, and shales (~1,600 ft) which has a depocenter roughly equivalent to the Delaware Basin/Tobosa Basin. There are several transgressive/regressive cycles within the section, but only the transgressive sandstone sections have significant porosity. The rest of the section typically consists of mud-rich carbonates and shales. In the Copperhead area, the Simpson is shaly, with low porosity and permeability.

**Montoya Group** – The Montoya deposits (~80 feet) are dominated by shallow-water, ramp limestones. Porosity within the Montoya Group is dependent on depositional environment and diagenesis. The

higher energy environments tend to have better initial porosity than the low-energy environments. Compaction destroys the porosity, and dolomitization produces secondary porosity. Based on the well logs, the average porosity is approximately 3%, with scattered zones over 5% (**Table 8**). The probable average permeability is probably less than 1 mD, but fracturing may enhance it.

While in some areas **Ellenburger Group** sediments are prospective injection zones, in this area Ellenburger rocks have low porosity and permeability (1 - 2% and < 1 mD) due their original depositional environment and the depth of burial (Loucks and Kerans, 2019). This makes it a potential underlying seal, ~550' in thickness.

**Cambrian to Precambrian** – The oldest sediment in the area is Cambrian Bliss Sandstone (Broadhead, 2017) which overlies Precambrian granites. The Bliss Sandstone and crystalline Precambrian rocks are potential lower seals. Porosity and permeability data indicates that in shallower wells, the Bliss is an aquifer. Within the Copperhead area, no porosity and permeability data could be found. Considering their depth, compactional history, and potential diagenetic alteration, the Bliss sandstones and associated granitic debris (from weathering of the basement rock) are probably relatively tight.

#### SEISMIC REVIEW

A search was conducted for seismic events recorded within a 10- and 20-mile radius (300 and 1,250 mi<sup>2</sup> respectively) surrounding the Copperhead AGI #1 well location. All seismic events of magnitude 2.0 or greater recorded by the New Mexico Tech Seismological Observatory and USGS databases from 1/12/17 to current day, were collected to determine if active seismicity exists near the proposed well location.

The search results from the New Mexico Tech Seismological Observatory database indicate 38 seismic events occurred from the period of January 2017 to present (**Figure 4**). The closest offset seismic event occurred approximately 8.3 miles from the proposed location and was a magnitude 2 event. The largest recorded seismic event within the 10 miles radius was a 4.03 magnitude event, at approximately 9.7 miles from the Copperhead AGI #001 location. Except for this 4.03 event, there are currently no seismic events of greater than 3.0 magnitude recorded within a 10 miles radius. In addition, all seismic activity reported from the period is concentrated to the southwestern edges of the 10 and 20 miles radius buffer zone. This more active area is a locus of oil production and concomitant SWD activity in the region.

There are 3 active monitoring stations located within 10 miles of the Copperhead AGI #001 well location. Among these 3 stations, one is in direct proximity to the well (**Figure 5**). There are 10 other seismic monitoring station within 10 to 20 miles of the well.

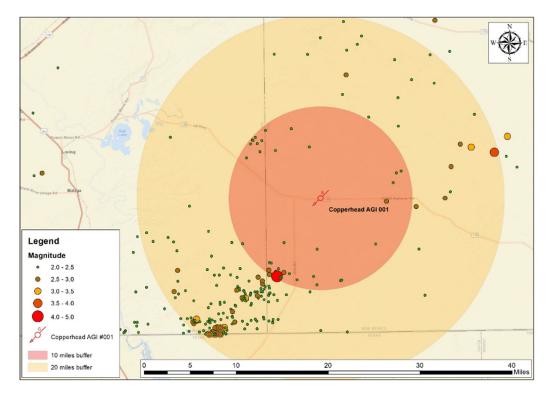


Figure 4. Seismic events, 2017 – 2024.

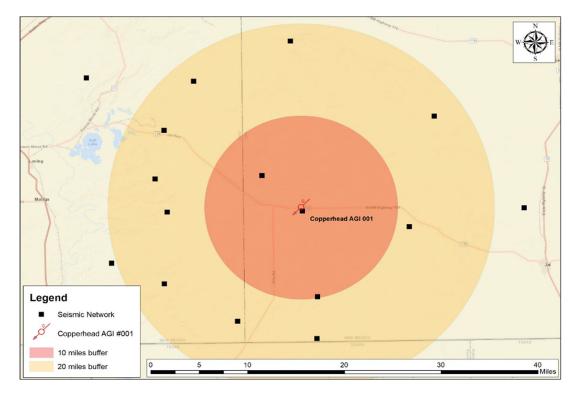


Figure 5. Existing seismic monitoring network surrounding Copperhead AGI #001.

#### **Fault Slip Potential**

As shown in **Figure 6**, at its maximum extent, the pressure front of the TAG injection plume remains well away from any faults in the area. Based on the map, there is no potential for fault slip due to the TAG injection process.

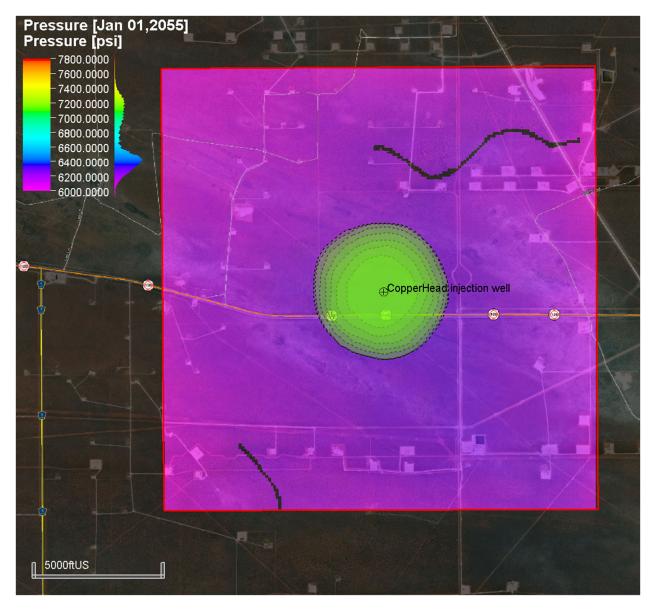


Figure 6. Map view showing maximum extent of TAG plume and fault traces projected to the surface within the area of the proposed well. No faults penetrate the injection zone near the proposed location.

#### IX. PROPOSED STIMULATION PROGRAM

A cleanup acid job may be used to remove mud and drill cuttings from the formation. No other formation stimulation is currently planned.

#### X. LOGGING AND TEST DATA

Logs will be submitted to the Division upon completion of the well.

## XI. GROUND WATER

There are four main sources of underground drinking water in the northern Delaware Basin of New Mexico (Ritchie et al., 1985; Lowry et al., 2018; USBLM, 2020). They include: Cenozoic alluvium, lithologically complex fluvial accumulations of the Pecos River and other streams, windblown sands, playa deposits, gypsite, and others, with TDS ranging from <200 to 15,000 mg/L with an average of 2,319 mg/L; the Santa Rosa member of the Dockum Group, a reddish-brown and gray cross-stratified sandstone with TDS ranging from 205 to 2,990 mg/L which serves as the principal source of groundwater in the eastern part of Eddy County and the western third of Lea County; the Rustler Formation, a brackish to saline (~10,000 to 300,000 mg/L TDS) anhydrite or gypsum formation with two dolomite marker beds and a basal zone of sandstone to shale which is typically utilized for livestock, irrigation, and enhanced oil recovery; and the Capitan Reef, a karst limestone with TDS of <300 to 10,000 mg/L (Ritchie et al., 1985; Lowry et al., 2018; USBLM, 2020).

Based on the New Mexico Water Rights Database from the New Mexico Office of the State Engineer, there are no freshwater wells located within one mile of the Copperhead AGI #1 well. The closest groundwater well is approximately 1.70 miles away, completed to a depth of 492 ft and collecting water in the Triassic Dockum Group (Santa Rosa), with primary use of livestock watering (Ritchie et al., 1985; NMOSE, 2021; **Table 9**; **Figure 7**). The shallow freshwater aquifer is protected by the surface and intermediate casings and cements in the Copperhead AGI #1.

Water chemistry is not available for well C-01932. However, image files in the NMOSE water rights database for the expired application of pod C-01896 which is approximately 1.1 miles away include a chemical analysis of groundwater quality in the Santa Rosa of the Dockum Group (**Table 10**). Targa also implements frequent sampling in two additional shallow Triassic groundwater wells, C-03666 POD1 and C-03917 POD1 located adjacent to the Red Hills Gas Plant at distances of 5.2 and 5.7 miles away from the Copperhead AGI #1 well respectively. Samples collected on 07/31/2023 indicate the water is basic with pH of 8-9 and calculated TDS of 453 to 1380 mg/L (**Attachment V**). Results of these analyses are consistent with groundwater quality in the Triassic formations throughout the region.

pod_file	use	status	Well depth	tws	rng	sec	county	easting_13N	northing_13N	own_name
C-01932	STK	ACT	492	245	32E	12	ED	628633	3567188	MCCLOY

Table 10. Geochemistry of Santa Rosa from well C-01896 application.

Са	Mg	Na, K	HCO₃	SO <sub>4</sub>	Cl	TDS	Spec. Cond
32	26	163	287	219	52	635	1030

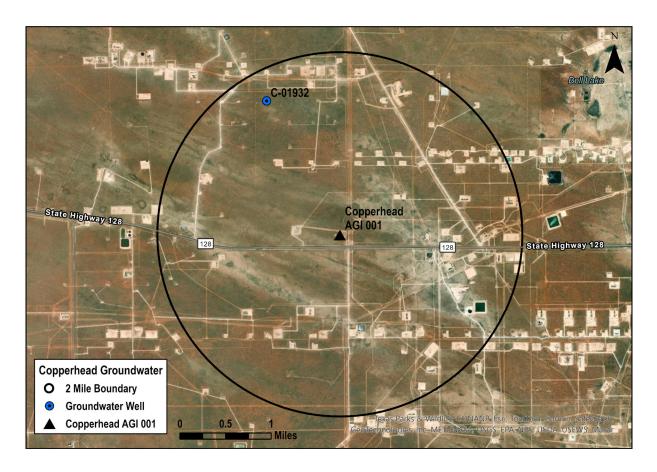


Figure 7. Groundwater wells near Copperhead AGI #001 from the NMOSE database.

References

Lowry, Thomas S., Michael D. Schuhen, Owen W. Lofton, La Tonya N. Walker, Patricia B. Johnson, Dennis W. Powers, and Dale O. Bowman. 2018. Water Resource Assessment in the New Mexico Permian Basin. Prepared by Sandia National Laboratories. SAND2018-12018. October 2018.

New Mexico Office of the State Engineer, Water Rights Division 2023. New Mexico Water Rights Reporting System, https://gis.osne.state.nm.us/gisapps/ose\_pod\_locations/(accessed August 2023 to November 2023)

Richey, S.F., Wells, J.G., and Stephens, K.T., 1985, Geohydrology of the Delaware Basin and vicinity, Texas and New Mexico: Water-Resources Investigations Report, doi:<u>10.3133/wri844077</u>

U.S. Department of the Interior Bureau of Land Management, 2020. BLM Water Support Document for Oil and Gas Development in New Mexico (BLM WSD 2020), 68 p.

## XII. NO HYDROLOGIC CONNECTION STATEMENT

Based on the available geological data we find no evidence of open faults and/or other hydrologic connection between the target injection zone for the Copperhead AGI #1 well and underground sources of drinking water.

Dana Ulmer Scholle, Research Scientist

Date: May 24, 2024

Dana klmer-Scholl

George El-Kaseeh, Section Head – Industry Service Outreach

Date: May 24, 2024

George El-kasesh

XIII. PROOF OF NOTICE

Targa researched land records 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. **Attachment III** includes the results of that search.

Attachment VI 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 Attachment VI.

# ATTACHMENT I: C-102 WELL LOCATION AND ACREAGE DEDICATION PLAT

Phone: (575) 393-616 <u>District II</u> 811 S. First St., Artes Phone: (575) 748-128 <u>District III</u> 1000 Rio Brazos Roa Phone: (505) 334-617 <u>District IV</u> 1220 S. St. Francis Di	French Dr., Hobs, NM 88240     State of New Mexico       (375) 393-6161 Fax: (375) 393-0720     Energy, Minerals & Natural Resources Department       First St., Artesis, NM 88210     OIL CONSERVATION DIVISION       0IL     0IL CONSERVATION DIVISION       11     0 Brazes Road, Aztec, NM 87410       005) 334-6170     Santa Fe, NM 87505					Form C-102 Revised August 1, 2011 Submit one copy to appropriate District Office				
		W	<u>ELL LC</u>			<u>REAGE DEDIC</u>		Γ		
1	API Numbe	r	1	<sup>2</sup> Pool Code			<sup>3</sup> Pool Name			
				97885	5		AGI; DEVO	NIAN		
<sup>4</sup> Property	Code				<sup>5</sup> Property			<sup>6</sup> Well Number		
					COPPERHE	AD AGI		1		
<sup>7</sup> OGRID	No.		<sup>8</sup> Operator Name <sup>9</sup> Eleva				evation			
2465	0			TARG	A MIDSTREAM	SERVICES LLC		3	579'	
					<sup>10</sup> Surface	Location		·····		
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County	
Р	13	24-S	32-E		793	SOUTH	429'	EAST	LEA	
			" Bo	ttom Ho	le Location I	f Different Fron	n Surface			
UL or lot no.			Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County	
<sup>12</sup> Dedicated Acro 40.03	es <sup>13</sup> Joint o	pr Infill <sup>14</sup> Co	nsolidation	Code <sup>15</sup> Or	rder No.					

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

16 D	C	В	A	<sup>17</sup> OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.
E .	F	G	H	Matt Cales     May 4, 2024       Signature     Date       Matt Eales       Printed Name       meales@targaresources.com       E-mail Address
L	K	J	I	<sup>19</sup> SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. FEBRUARY 9, 2024 Date of Survey
М	N	0 GEODETIC COORDIN NAD 83 NME X=761583.3 Y=441810.7 LAT. 32°12'45.39 LONG. 103°37'16.3	"N R	Signature and Seal of Professional Auge POWERS

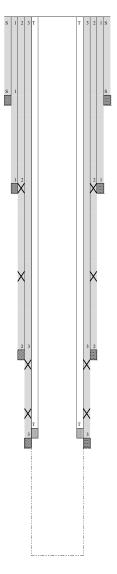
# ATTACHMENT II: WELLBORE DIAGRAM

WELLBORE SCHEMATIC Targa Midstream Services LLC Copperhead AGI #1 429' FEL & 793' FSL Sec. 13-T245-R32E GL 3579'

#### Surface - (Conventional)

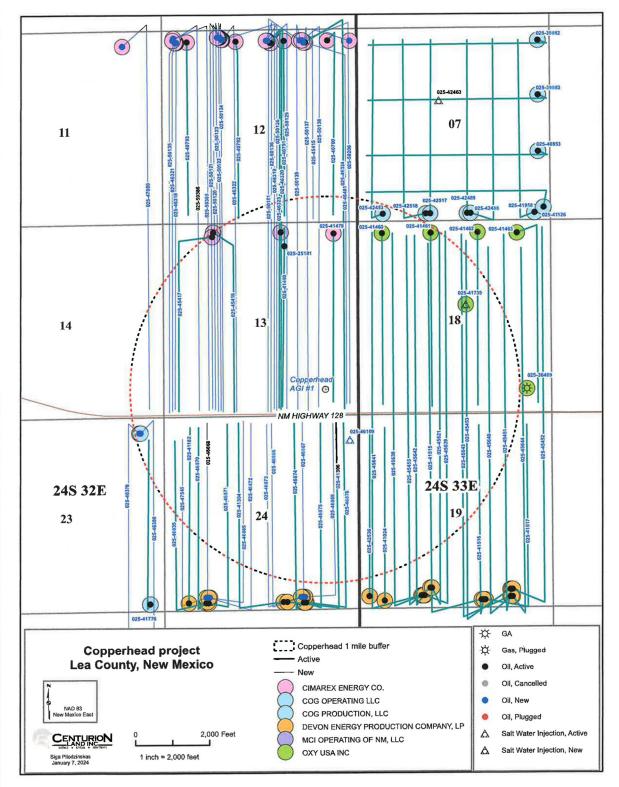
	,
Hole Size:	26"
Casing:	20" - 106.5# J-55 BTC Casing
Depth Top:	Surface
Depth Btm:	1028'
Cement:	Lead Class C 1680 sks, 12.9 ppg, 1.97
	cuft/sk Tail Class C 200 sks, 14.8 ppg, 1.34
Cement Top:	cuft/sk Surface - (Circulate)
	curto six burnee (circumte)
Intermediate #1 -	(Conventional)
Hole Size:	17.5"
Casing:	13.375" - 72L-80 BTC Casing
Depth Top:	Surface
Depth Btm:	5034'
Cement:	Lead Class C, 1450 sks, 11.8 ppg, 2.45 cuft/sk
	Tail CorrosaCem, 200 sks, 14.5 ppg, 1.30 cuft/sk
Cement Top:	Surface - (Circulate)
	× ,
Intermediate #2 -	
Hole Size:	12.25"
Casing:	9.625" - 47# HCL-80 BTC Casing
	Bond Coat 5034'-7100'
Depth Top:	Surface
Depth Btm:	12250'
Cement 1:	Lead Class C, 892 sks, 12.5 ppg, 1.63 cuft/sk
	Tail Class C, 100 sks, 14.8 ppg, 1.33 cuft/sk
Cement Top:	7100' - (Circulate)
ECP/DV Tool:	7100'
Cement 2:	362 sks-CorrosaCem, 12.0 ppg, 1.75 cuft/sk
Cement 2 Top:	5070'- (Circulate)
DV Tool:	5070'
Cement 3:	Lead Class C, 850 sks, 12.5 ppg, 1.63 cuft/sk
	Tail Class C, 200 sks, 14.8 ppg, 1.33 cuft/sk
Cement 3 Top:	Surface - (Circulate)
Duraduration	
Production Hole Size:	8.5"
Casing #1:	o.5 7" - 32# P-110 TCPC Casing (or equivalent)
Depths:	Surface - 16999'
Casing #2:	7" - 32# G3-110 TCPC Casing (or equivalent)
Depths:	16999' - 17299'
Cement:	7 bbl WellLock Resin
Cement Top:	17568' - (Circulate)
ECP/DV Tool:	17568'
Cement 2:	Lead Class H, 263 sks, 12.5 ppg, 1.63 cuft/sk
cement 2.	Tail Class H, 200 sks, 12.5 ppg, 1.05 cult/sk
Cement 2 Top:	12200' - (Circulate)
ECP/DV Tool:	12200' (Crediate)
Cement 3:	Lead Class C 1013 sks, 12.5 ppg, 1.63 cuft/sk
Cement 5.	Tail Class C 200 sks, 14.8 ppg, 1.33 cuft/sk
Cement 3 Top:	Surface - (Circulate)
Intermediate #4 -	(Open Hole)
Hole Size:	5.875"
Depth:	18699'
Inj. Interval:	17299' - 18699'
Tubing - (Convent	tional)

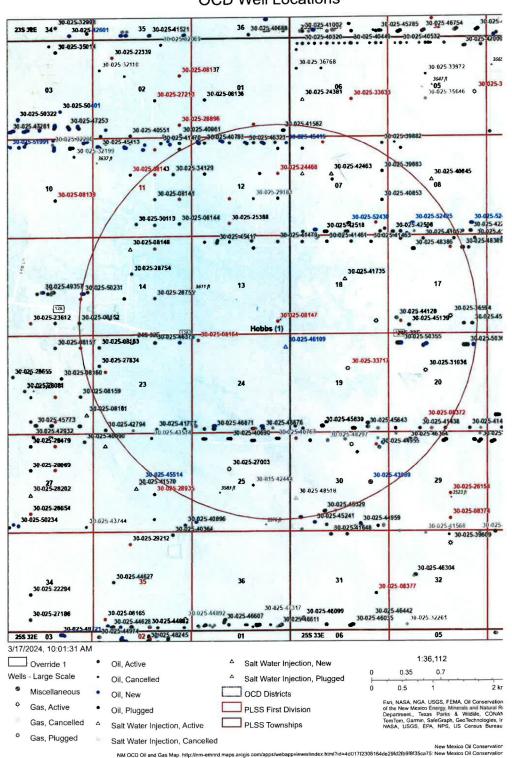
Tubing - (Conven	tional)
Tubing Depth:	0 - 16950' L80, 16950 - 17250 G3
Tubing:	3.5" - 9.2# G3-110 VAMTOP (or equivalent)
Packer Depth:	17250'
Packer:	3.5" - "Perma-Pak" or Equivalent (Inconel)
Packer Fluid:	Diesel + Additives



.

# ATTACHMENT III: WELL AND LEASE MAPS





OCD Well Locations

## Table III-1. List of all active, plugged, or new well locations in a 2-mile radius

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002508147	WOOLLEY #001	Plugged	PRE-ONGARD WELL OPERATOR	NA	5063	0.05	1957	1957	32.212265	-103.62197
3002546109	MCCLOY CENTRAL SWD #001	New	NGL WATER SOLUTIONS PERMIAN, LLC	SWD, DEV- SIL	0	0.28	9999	9999	32.208562	-103.62060
3002541735	COPPERHEAD 18 STATE SWD #001	Active	OXY USA INC	SWD, DEL	6800	0.76	2014	9999	32.218628	-103.61036
3002525181	WIMBERLY A #001	Active	Finaly Resources	DEL	5050	0.78	1975	9999	32.223160	-103.62621
3002541479	DOS EQUIS 13 FEDERAL COM #001H	Active	CIMAREX ENERGY CO.	BSPG	10988	0.79	2014	9999	32.224075	-103.62194
3002541460	COPPERHEAD 18 STATE #002H	Active	OXY USA INC	BSPG	11060	0.81	2014	9999	32.224049	-103.61768
3002533717	STATE 19 #001	Plugged	DEVON ENERGY PRODUCTION COMPANY, LP	ΑΤΟΚΑ	15966	0.83	1997	9999	32.205322	-103.60990
3002541480	DOS EQUIS 13 FEDERAL COM #002H	Active	CIMAREX ENERGY CO.	BSPG	10937	0.86	2014	9999	32.224201	-103.62653
3002508164	PRE-ONGARD WELL #001	Plugged	PRE-ONGARD WELL OPERATOR	NA	5080	0.88	1900	9999	32.209507	-103.63581
3002541461	COPPERHEAD 18 STATE #003H	Active	OXY USA INC	BSPG	11076	0.91	2014	9999	32.224045	-103.61340
3002542453	MACHO NACHO STATE COM #010H	Active	COG PRODUCTION, LLC	BSPG	9480	0.91	2015	9999	32.225496	-103.61758
3002536489	COPPERHEAD 18 STATE #001	Active	OXY USA INC	WOLF	14627	0.95	2004	9999	32.212261	-103.60503
3002552433	MACHO NACHO STATE COM #608H	New	COG OPERATING LLC	WOLF	0	0.96	9999	9999	32.225770	-103.61558

.

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002552429	MACHO NACHO STATE COM #607H	New	COG OPERATING LLC	BSPG	0	0.97	9999	9999	32.225770	-103.61548
3002552432	MACHO NACHO STATE COM #606H	New	COG OPERATING LLC	WOLF	0	0.97	9999	9999	32.225770	-103.61538
3002552428	MACHO NACHO STATE COM #605H	New	COG OPERATING LLC	BSPG	0	0.97	9999	9999	32.225770	-103.61529
3002542518	MACHO NACHO STATE COM #009H	Active	COG PRODUCTION, LLC	BSPG	9533	0.99	2015	9999	32.225493	-103.61383
3002542517	MACHO NACHO STATE COM #008H	Active	COG PRODUCTION, LLC	BSPG	9496	1.00	2015	9999	32.225493	-103.61344
3002545417	DOS EQUIS 13 FEDERAL COM #010H	Active	CIMAREX ENERGY CO.	BSPG	11045	1.03	2019	9999	32.223920	-103.63259
3002545416	DOS EQUIS 13 FEDERAL COM #009H	Active	CIMAREX ENERGY CO.	BSPG/ WOLF	11051	1.04	2019	9999	32.224250	-103.63250
3002541462	COPPERHEAD 18 STATE #004H	Active	OXY USA INC	BSPG	10980	1.05	2014	9999	32.224041	-103.60929
3002546380	EIDER 23 FEDERAL #701H	New	COG PRODUCTION, LLC	WOLF	0	1.06	9999	9999	32.209203	-103.63892
3002546378	EIDER 23 FEDERAL #601H	New	COG PRODUCTION, LLC	WOLF	0	1.07	9999	9999	32.209202	-103.63901
3002542536	BELL LAKE 19 STATE #006H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	9716	1.10	2015	9999	32.196823	-103.61896
3002542489	MACHO NACHO STATE COM #007H	Active	COG PRODUCTION, LLC	BSPG	9477	1.10	2015	9999	32.225490	-103.61021
3002546869	BELL LAKE 24 FEDERAL #013H	New	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	0	1.11	2021	9999	32.196809	-103.62462
3002542488	MACHO NACHO STATE COM #006H	Active	COG PRODUCTION, LLC	BSPG	9527	1.11	2015	9999	32.225490	-103.60989
3002546867	BELL LAKE 24 FEDERAL #011H	New	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	9266	1.11	2021	9999	32.196808	-103.62471

.

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002546866	BELL LAKE 24 FEDERAL #010H	New	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	9295	1.11	2021	9999	32.196808	-103.62481
3002546873	BELL LAKE 24 FEDERAL #021H	New	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG/ WOLF	10041	1.11	2021	9999	32.196808	-103.62491
3002525388	PRE-ONGARD WELL #007	Plugged	PRE-ONGARD WELL OPERATOR	NA	5100	1.12	1900	9999	32.226780	-103.63043
3002541024	BELL LAKE 19 STATE #001H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	11054	1.13	2013	9999	32.196472	-103.61762
3002546876	BELL LAKE 24 FEDERAL #025H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	0	1.13	2020	9999	32.196396	-103.62452
3002546875	BELL LAKE 24 FEDERAL #024H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	0	1.13	2020	9999	32.196396	-103.62462
3002546874	BELL LAKE 24 FEDERAL #022H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	0	1.14	2020	9999	32.196396	-103.62471
3002545455	BELL LAKE 19 18 STATE COM #017H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	9350	1.14	2019	9999	32.197392	-103.61361
3002545454	BELL LAKE 19 18 STATE COM #013	Plugged	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	120	1.14	2019	9999	32.197392	-103.61352
3002545621	BELL LAKE 19 18 STATE COM #013Y	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	9491	1.14	2019	9999	32.197392	-103.61347
3002541306	BELL LAKE 24 FEDERAL #002H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	11082	1.15	2014	9999	32.196457	-103.62612
3002544127	HEARTTHROB 17 STATE #701H	Active	EOG RESOURCES INC	WOLF	12447	1.15	2018	9999	32.212704	-103.60154
3002541307	BELL LAKE 24 FEDERAL #003H	Plugged	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	11064	1.15	2014	2015	32.196457	-103.62628
3002541304	BELL LAKE 24 FEDERAL #004H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	11056	1.15	2014	9999	32.196457	-103.62645
3002545641	BELL LAKE 19 18 STATE COM #034H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	12229	1.16	2019	9999	32.196842	-103.61439

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002544128	HEARTTHROB 17 STATE #702H	Active	EOG RESOURCES INC	WOLF	12422	1.16	2018	9999	32.212704	-103.60143
3002545638	BELL LAKE 19 18 STATE COM #030H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	12469	1.16	2019	9999	32.196842	-103.61429
3002545642	BELL LAKE 19 18 STATE COM #035H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	12325	1.16	2019	9999	32.196842	-103.61420
3002545639	BELL LAKE 19 18 STATE COM #031H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	12515	1.16	2019	9999	32.196842	-103.61410
3002552431	MACHO NACHO STATE COM #604H	New	COG OPERATING LLC	WOLF	0	1.18	9999	9999	32.226688	-103.60981
3002552427	MACHO NACHO STATE COM #603H	New	COG OPERATING LLC	BSPG	0	1.18	9999	9999	32.226688	-103.60971
3002552430	MACHO NACHO STATE COM #602H	New	COG OPERATING LLC	WOLF	0	1.18	9999	9999	32.226688	-103.60961
3002552426	MACHO NACHO STATE COM #601H	New	COG OPERATING LLC	BSPG	0	1.19	9999	9999	32.226688	-103.60957
3002546126	HYPERION STATE #141H	Active	TAP ROCK OPERATING, LLC	BSPG	10493	1.19	2019	9999	32.209055	-103.60139
3002545842	HYPERION STATE #221H	Active	TAP ROCK OPERATING, LLC	WOLF	12915	1.19	2019	9999	32.208986	-103.60139
3002541463	COPPERHEAD 18 STATE #005H	Active	OXY USA INC	BSPG	11109	1.19	2014	9999	32.223984	-103.60585
3002520400	PRE-ONGARD WELL #001	Plugged	PRE-ONGARD WELL OPERATOR	NA	5230	1.20	1963	1963	32.212257	-103.60076
3002546659	HYPERION STATE #131H	Active	TAP ROCK OPERATING, LLC	WOLF	12248	1.20	2020	9999	32.209053	-103.60113
3002546658	HYPERION STATE #201H	Active	TAP ROCK OPERATING, LLC	WOLF	12486	1.20	2020	9999	32.208985	-103.60113
3002546661	HYPERION STATE #215H	Active	TAP ROCK OPERATING, LLC	WOLF	12572	1.20	2020	9999	32.209054	-103.60105
3002546660	HYPERION STATE #205H	Active	TAP ROCK OPERATING, LLC	WOLF	12945	1.21	2020	9999	32.208985	-103.60105
3002548665	HYPERION STATE #151H	Active	TAP ROCK OPERATING, LLC	BSPG	11480	1.22	2022	9999	32.209053	-103.60079

ΑΡΙ	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002508376	PRE-ONGARD WELL #001	Plugged	PRE-ONGARD WELL OPERATOR	NA	5108	1.22	1961	1961	32.195015	-103.61882
3002548662	HYPERION STATE #101H	New	TAP ROCK OPERATING, LLC	BSPG	0	1.22	2022	9999	32.208985	-103.60079
3002548667	HYPERION STATE #171H	Active	TAP ROCK OPERATING, LLC	BSPG	9549	1.22	2022	9999	32.209053	-103.60071
3002548669	HYPERION STATE #181H	Active	TAP ROCK OPERATING, LLC	BSPG	9967	1.23	2022	9999	32.208985	-103.60071
3002526643	PRE-ONGARD WELL #002	Plugged	PRE-ONGARD WELL OPERATOR	DEL	5100	1.23	1980	1980	32.230423	-103.62193
3002548668	HYPERION STATE #172H	New	TAP ROCK OPERATING, LLC	BSPG	0	1.23	2022	9999	32.209053	-103.60063
3002550355	HYPERION STATE #125H	Active	TAP ROCK OPERATING, LLC	BSPG	10872	1.23	2022	9999	32.208985	-103.60063
3002545138	HEARTTHROB 17 STATE #703H	Active	EOG RESOURCES INC	WOLF	12473	1.28	2019	9999	32.211675	-103.59939
3002545139	HEARTTHROB 17 STATE #704H	Active	EOG RESOURCES INC	WOLF	12510	1.29	2019	9999	32.211674	-103.59928
3002546865	BELL LAKE 24 FEDERAL #008H	New	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	0	1.29	2021	9999	32.196849	-103.63296
3002546872	BELL LAKE 24 FEDERAL #019H	New	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG/ WOLF	0	1.29	2021	9999	32.196849	-103.63305
3002546868	BELL LAKE 24 FEDERAL #012H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	9311	1.29	2021	9999	32.196849	-103.63315
3002529180	PRE-ONGARD WELL #001	Plugged	PRE-ONGARD WELL OPERATOR	NA	5020	1.29	1985	1985	32.231331	-103.62299
3002547545	BELL LAKE 24 FEDERAL #014H	New	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	9383	1.30	2021	9999	32.196848	-103.63325
3002546381	EIDER 23 FEDERAL #702H	Active	COG PRODUCTION, LLC	WOLF	12390	1.31	2019	9999	32.209186	-103.64318
3002546870	BELL LAKE 24 FEDERAL #016H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	0	1.31	2020	9999	32.196536	-103.63315
3002528755	JENNINGS FEDERAL #006	Active	MCI OPERATING OF NM, LLC	DEL	4933	1.31	1984	9999	32.215824	-103.64326

ΑΡΙ	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002546871	BELL LAKE 24 FEDERAL #018H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	0	1.31	2020	9999	32.196436	-103.63306
3002546379	EIDER 23 FEDERAL #602H	Active	COG PRODUCTION, LLC	WOLF	12364	1.31	2019	9999	32.209185	-103.64328
3002541515	BELL LAKE 19 STATE #002H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	11105	1.32	2014	9999	32.196472	-103.60911
3002546835	BELL LAKE 24 FEDERAL #015H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	0	1.32	2020	9999	32.196436	-103.63325
3002541516	BELL LAKE 19 STATE #003H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	11114	1.32	2014	9999	32.196472	-103.60895
3002540690	DOUBLE X 25 FEDERAL #004	Active	CIMAREX ENERGY CO.	BSPG	10832	1.33	2012	9999	32.194988	-103.63027
3002541517	BELL LAKE 19 STATE #004H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	11088	1.33	2014	9999	32.196472	-103.60879
3002541958	MACHO NACHO STATE COM #005H	Active	COG PRODUCTION, LLC	BSPG	9512	1.33	2014	9999	32.225494	-103.60428
3002525552	PRE-ONGARD WELL #008	Plugged	PRE-ONGARD WELL OPERATOR	DEL	5070	1.34	1977	1979	32.230408	-103.63042
3002508369	PRE-ONGARD WELL #001	Plugged	PRE-ONGARD WELL OPERATOR	NA	5165	1.36	1958	1958	32.226788	-103.60502
3002545453	BELL LAKE 19 18 STATE COM #010H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	9339	1.36	2019	9999	32.197239	-103.60658
3002545451	BELL LAKE 19 18 STATE COM #007H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	9509	1.36	2019	9999	32.197239	-103.60649
3002545452	BELL LAKE 19 18 STATE COM #009H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	9336	1.37	2019	9999	32.197239	-103.60639
3002541182	BELL LAKE 24 FEDERAL #001H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	10991	1.37	2013	9999	32.196434	-103.63478
3002541126	MACHO NACHO STATE #004H	Active	COG PRODUCTION, LLC	BSPG	10826	1.38	2013	9999	32.225880	-103.60350
3002545643	BELL LAKE 19 18 STATE COM #036H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	12289	1.39	2019	9999	32.196689	-103.60658

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002545640	BELL LAKE 19 18 STATE COM #032H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	12467	1.39	2019	9999	32.196689	-103.60649
3002545644	BELL LAKE 19 18 STATE COM #037H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	12332	1.40	2019	9999	32.196689	-103.60639
3002542505	EATA FAJITA STATE #011H	Active	COG PRODUCTION, LLC	BSPG	9606	1.42	2015	9999	32.225438	-103.60216
3002508144	GULF HANAGAN FEDERAL #001	Active	MARKS AND GARNER PRODUCTION LTD CO	DEL	5065	1.43	1962	9999	32.226757	-103.63897
3002542506	EATA FAJITA STATE #012H	Active	COG PRODUCTION, LLC	BSPG	9520	1.43	2015	9999	32.225438	-103.60199
3002546765	HYPERION STATE COM #137H	Active	TAP ROCK OPERATING, LLC	WOLF	12713	1.45	2020	9999	32.208677	-103.59693
3002541056	HEARTTHROB BSX STATE #001H	Active	EOG RESOURCES INC	BSPG	11116	1.45	2014	9999	32.224419	-103.60075
3002546766	HYPERION STATE #202H	Active	TAP ROCK OPERATING, LLC	WOLF	12504	1.45	2020	9999	32.208615	-103.59689
3002546767	HYPERION STATE #217H	Active	TAP ROCK OPERATING, LLC	WOLF	12570	1.45	2020	9999	32.208707	-103.59686
3002534148	STATE 30 #001	Plugged	COBRA OIL & GAS CORPORATION	wc	15585	1.45	1997	1999	32.194107	-103.60931
3002548663	HYPERION STATE #102H	New	TAP ROCK OPERATING, LLC	BSPG	0	1.47	2022	9999	32.208832	-103.59655
3002548666	HYPERION STATE #152H	New	TAP ROCK OPERATING, LLC	BSPG	0	1.47	2022	9999	32.208877	-103.59652
3002550356	HYPERION STATE #127H	New	TAP ROCK OPERATING, LLC	BSPG	10831	1.48	2022	9999	32.208928	-103.59632
3002524468	WIMBERLY #003	Plugged	PRIMAL ENERGY CORPORATION	DEL	5070	1.48	1973	2002	32.234070	-103.62192
3002508150	PRE-ONGARD WELL #003	Plugged	PRE-ONGARD WELL OPERATOR	DEL	5030	1.48	1962	1982	32.223106	-103.64325
3002548670	HYPERION STATE #182H	New	TAP ROCK OPERATING, LLC	BSPG	0	1.48	2022	9999	32.208866	-103.59628
3002542487	EATA FAJITA STATE #013H	Active	COG PRODUCTION, LLC	BSPG	9570	1.49	2015	9999	32.225458	-103.60076

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002540582	EATA FAJITA STATE #001H	Active	COG PRODUCTION, LLC	BSPG	11002	1.49	2013	9999	32.225491	-103.60075
3002524432	INGRAM O STATE #002	Plugged	ROVER OPERATING, LLC	SWD, DEL	5204	1.49	1973	2022	32.234070	-103.61765
3002541776	TREASURE ISLAND FEDERAL #001H	Active	COG PRODUCTION, LLC	BSPG	10722	1.49	2014	9999	32.196396	-103.63815
3002524530	WIMBERLY #004	Plugged	PRIMAL ENERGY CORPORATION	DEL	5030	1.50	1973	1997	32.234066	-103.62511
3002547137	HEARTTHROB 17 STATE #201H	Active	EOG RESOURCES INC	BSPG	9536	1.50	2021	9999	32.222940	-103.59871
3002547138	HEARTTHROB 17 STATE #202H	Active	EOG RESOURCES INC	BSPG	9788	1.50	2021	9999	32.222940	-103.59866
3002548386	HEARTTHROB 17 STATE #101H	Active	EOG RESOURCES INC	BSPG	9449	1.50	2021	9999	32.222940	-103.59861
3002547139	HEARTTHROB 17 STATE #203H	Active	EOG RESOURCES INC	BSPG	9595	1.50	2021	9999	32.222940	-103.59856
3002508368	PRE-ONGARD WELL #002	Plugged	PRE-ONGARD WELL OPERATOR	NA	5076	1.50	1962	1962	32.233158	-103.61249
3002547140	HEARTTHROB 17 STATE #204H	Active	EOG RESOURCES INC	BSPG	9934	1.51	2021	9999	32.222940	-103.59851
3002548387	HEARTTHROB 17 STATE #102H	Active	EOG RESOURCES INC	BSPG	9493	1.51	2021	9999	32.222940	-103.59846
3002552371	EATA FAJITA STATE COM #607H	New	COG OPERATING LLC	BSPG	0	1.53	9999	9999	32.225208	-103.59968
3002531036	STATE 20 #001	Active	RUBICON OIL & GAS, LLC	MORR OW	16000	1.54	1990	9999	32.204994	-103.59650
3002549284	EIDER 23 FEDERAL COM #703H	New	COG PRODUCTION, LLC	WOLF	0	1.54	9999	9999	32.209225	-103.64721
3002549285	EIDER 23 FEDERAL COM #704H	New	COG PRODUCTION, LLC	WOLF	0	1.55	9999	9999	32.209224	-103.64731
3002549286	EIDER 23 FEDERAL COM #705H	New	COG PRODUCTION, LLC	WOLF	0	1.55	9999	9999	32.209224	-103.64740

ΑΡΙ	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002542463	MACHO NACHO 7 STATE SWD #001	Active	SOLARIS WATER MIDSTREAM, LLC	SWD, DEL	7385	1.56	2015	9999	32.234001	-103.61263
3002540853	MACHO NACHO STATE #003H	Active	COG PRODUCTION, LLC	BSPG	10891	1.57	2013	9999	32.230110	-103.60395
3002508375	PRE-ONGARD WELL #001	Plugged	PRE-ONGARD WELL OPERATOR	NA	350	1.59	1961	1961	32.194107	-103.60504
3002541439	HYPERION STATE #005H	Active	TAP ROCK OPERATING, LLC	BSPG	11127	1.59	2014	9999	32.196468	-103.60168
3002528754	JENNINGS FEDERAL #005	Active	MCI OPERATING OF NM, LLC	DEL	4950	1.60	9999	9999	32.219456	-103.64732
3002508142	PRE-ONGARD WELL #003	Plugged	PRE-ONGARD WELL OPERATOR	DEL	4986	1.61	1900	9999	32.230385	-103.63897
3002508145	GULF HANAGAN FEDERAL #002	Active	MCI OPERATING OF NM, LLC	DEL	5046	1.61	1962	9999	32.226570	-103.64324
3002548301	MAMBA 30 STATE COM #210H	New	EOG RESOURCES INC	BSPG	0	1.62	9999	9999	32.194337	-103.60390
3002527003	FEDERAL BM #001	Plugged	DEVON ENERGY PRODUCTION COMPANY, LP	wc	15973	1.62	1980	2007	32.190453	-103.63053
3002548300	MAMBA 30 STATE COM #209H	New	EOG RESOURCES INC	BSPG	0	1.62	9999	9999	32.194277	-103.60382
3002525149	JENNINGS FEDERAL #004	Active	MCI OPERATING OF NM, LLC	DEL	5000	1.62	9999	9999	32.215801	-103.64864
3002527754	EXXON 23 FEDERAL #001	Active	3 Knights Operating LLC	DEL	4985	1.62	1982	9999	32.209450	-103.64865
3002544053	MAMBA 30 STATE COM #501H	Active	EOG RESOURCES INC	BSPG	11155	1.63	2018	9999	32.193714	-103.60453
3002552372	EATA FAJITA STATE COM #608H	New	COG OPERATING LLC	WOLF	0	1.63	9999	9999	32.226691	-103.59885
3002544955	MAMBA 30 STATE COM #502H	Active	EOG RESOURCES INC	BSPG	11157	1.63	2018	9999	32.193654	-103.60445
3002552425	EATA FAJITA STATE COM #606H	New	COG OPERATING LLC	WOLF	0	1.64	9999	9999	32.226691	-103.59865

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002541057	HEARTTHROB BSX STATE #002H	Active	EOG RESOURCES INC	BSPG	10862	1.64	2014	9999	32.224411	-103.59687
3002552370	EATA FAJITA STATE COM #605H	New	COG OPERATING LLC	BSPG	0	1.64	9999	9999	32.226691	-103.59856
3002508146	PRE-ONGARD WELL #003	Plugged	PRE-ONGARD WELL OPERATOR	DEL	5049	1.68	1962	1963	32.234051	-103.63469
3002541777	TREASURE ISLAND FEDERAL #002H	Active	COG PRODUCTION, LLC	BSPG	10961	1.70	2014	9999	32.196373	-103.64296
3002536594	ATOKA BANK BDJ STATE COM #001	Active	EOG RESOURCES INC	MORR OW	16033	1.70	2004	9999	32.212933	-103.59219
3002508148	JENNINGS FEDERAL #001	Active	MCI OPERATING OF NM, LLC	SWD, DEL	5019	1.70	1962	9999	32.223084	-103.64755
3002524433	WIMBERLY #002	Plugged	PRIMAL ENERGY CORPORATION	DEL	5038	1.73	1973	2000	32.237698	-103.62190
3002540570	EATA FAJITA STATE #002H	Active	COG PRODUCTION, LLC	BSPG	11125	1.74	2013	9999	32.226116	-103.59608
3002524347	STATE O #001	Plugged	TAHOE ENERGY INC	DEL	5204	1.74	1973	2002	32.237698	-103.61764
3002508149	JENNINGS FEDERAL #002	Active	MCI OPERATING OF NM, LLC	DEL	5000	1.75	1962	9999	32.212772	-103.65113
3002546365	BANDIT 29 STATE COM #707H	Active	EOG RESOURCES INC	WOLF	12461	1.76	2019	9999	32.194682	-103.59971
3002546302	BANDIT 29 STATE COM #604H	Active	EOG RESOURCES INC	BSPG	12267	1.77	2019	9999	32.194682	-103.59960
3002530113	WIMBERLY #006	Active	ROVER OPERATING, LLC	DEL	5075	1.77	9999	9999	32.226719	-103.64648
3002546364	BANDIT 29 STATE COM #705H	Active	EOG RESOURCES INC	WOLF	12485	1.77	2019	9999	32.194682	-103.59949
3002544953	BANDIT 29 STATE COM #507H	Active	EOG RESOURCES INC	BSPG	11118	1.77	2018	9999	32.194847	-103.59930
3002508372	PRE-ONGARD WELL #001	Plugged	PRE-ONGARD WELL OPERATOR	NA	5219	1.77	1961	1961	32.197723	-103.59650

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002544952	BANDIT 29 STATE COM #506H	Active	EOG RESOURCES INC	BSPG	11143	1.78	2018	9999	32.194847	-103.59919
3002508141	HANAGAN D FEDERAL #002	Active	MCI OPERATING OF NM, LLC	DEL	4962	1.78	1962	9999	32.230366	-103.64323
3002541438	HYPERION STATE #004H	Active	TAP ROCK OPERATING, LLC	BSPG	11131	1.78	2014	9999	32.196461	-103.59750
3002544951	BANDIT 29 STATE COM #505H	Active	EOG RESOURCES INC	BSPG	11150	1.78	2018	9999	32.194846	-103.59909
3002545415	DOS EQUIS 12 FEDERAL COM #007H	New	CIMAREX ENERGY CO.	BSPG	0	1.79	9999	9999	32.238555	-103.62043
3002546481	DOS EQUIS 12 13 FEDERAL COM #006H	Active	CIMAREX ENERGY CO.	BSPG/ WOLF	12951	1.79	2019	9999	32.238470	-103.62435
3002546324	DOS EQUIS 12 13 FEDERAL COM #086H	Active	CIMAREX ENERGY CO.	WOLF	12419	1.79	2019	9999	32.238470	-103.62441
3002550137	DOS EQUIS 12 13 FEDERAL COM #087H	New	CIMAREX ENERGY CO.	WOLF	0	1.79	9999	9999	32.238470	-103.62448
3002540700	DOS EQUIS 12 FEDERAL COM #001	Active	CIMAREX ENERGY CO.	BSPG	11085	1.79	2012	9999	32.238606	-103.62239
3002550206	DOS EQUIS 12 13 FEDERAL COM #088H	New	CIMAREX ENERGY CO.	BSPG	0	1.80	9999	9999	32.238635	-103.62461
3002550138	DOS EQUIS 12 13 FEDERAL COM #089H	New	CIMAREX ENERGY CO.	BSPG	0	1.80	9999	9999	32.238635	-103.62467
3002550139	DOS EQUIS 12 13 FEDERAL COM #090H	New	CIMAREX ENERGY CO.	BSPG	0	1.80	9999	9999	32.238635	-103.62474
3002550181	DOS EQUIS 11 14 FEDERAL COM #091H	New	CIMAREX ENERGY CO.	BSPG	0	1.81	9999	9999	32.238635	-103.62480
3002539883	MACHO NACHO STATE #002H	Active	COG OPERATING LLC	BSPG	10893	1.81	2013	9999	32.234356	-103.60394
3002549702	BANDIT 29 STATE COM #741H	New	EOG RESOURCES INC	WOLF	0	1.81	2022	9999	32.194845	-103.59837

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002540791	DOS EQUIS 12 FEDERAL COM #002H	Active	CIMAREX ENERGY CO.	BSPG	11027	1.81	2013	9999	32.238598	-103.62617
3002549705	BANDIT 29 STATE COM #751H	New	EOG RESOURCES INC	WOLF	0	1.82	2022	9999	32.194845	-103.59831
3002546320	DOS EQUIS 12 13 FEDERAL COM #005H	Active	CIMAREX ENERGY CO.	BSPG/ WOLF	12418	1.82	2020	9999	32.238468	-103.62732
3002546323	DOS EQUIS 12 13 FEDERAL COM #073H	Active	CIMAREX ENERGY CO.	WOLF	12396	1.82	2020	9999	32.238468	-103.62739
3002549703	BANDIT 29 STATE COM #742H	New	EOG RESOURCES INC	WOLF	0	1.82	2022	9999	32.194845	-103.59824
3002549704	BANDIT 29 STATE COM #743H	New	EOG RESOURCES INC	WOLF	0	1.82	2022	9999	32.194845	-103.59818
3002550125	DOS EQUIS 12 13 FEDERAL COM #075H	New	CIMAREX ENERGY CO.	BSPG	0	1.83	9999	9999	32.238633	-103.62758
3002550126	DOS EQUIS 12 13 FEDERAL COM #076H	New	CIMAREX ENERGY CO.	BSPG	0	1.83	9999	9999	32.238633	-103.62765
3002550136	DOS EQUIS 12 13 FEDERAL COM #077H	New	CIMAREX ENERGY CO.	WOLF	0	1.83	9999	9999	32.238633	-103.62771
3002545140	HEARTTHROB 17 STATE COM #705H	Active	EOG RESOURCES INC	WOLF	12553	1.83	2019	9999	32.211847	-103.58991
3002524634	PRE-ONGARD WELL #001	Plugged	PRE-ONGARD WELL OPERATOR	NA	5121	1.84	1973	1974	32.238602	-103.61411
3002545141	HEARTTHROB 17 STATE COM #706H	Active	EOG RESOURCES INC	WOLF	12558	1.84	2019	9999	32.211847	-103.58980
3002534129	WIMBERLY #007	Active	Finaly Resources	DEL	5118	1.84	1997	9999	32.234032	-103.64003
3002520396	PRE-ONGARD WELL #001	Plugged	PRE-ONGARD WELL OPERATOR	NA	5242	1.85	1964	1964	32.223141	-103.59219
3002547034	HYPERION STATE COM #206H	Active	TAP ROCK OPERATING, LLC	WOLF	12459	1.85	2021	9999	32.208724	-103.58990
3002547033	HYPERION STATE COM #203H	Active	TAP ROCK OPERATING, LLC	WOLF	0	1.85	2021	9999	32.208656	-103.58990

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002547032	HYPERION STATE COM #204H	Active	TAP ROCK OPERATING, LLC	WOLF	0	1.86	2021	9999	32.208725	-103.58981
3002547035	HYPERION STATE COM #208H	Active	TAP ROCK OPERATING, LLC	WOLF	12499	1.86	2021	9999	32.208656	-103.58981
3002548563	HYPERION STATE COM #223H	Active	TAP ROCK OPERATING, LLC	WOLF	13025	1.86	2021	9999	32.208651	-103.58973
3002540792	DOS EQUIS 12 FEDERAL COM #003H	Active	CIMAREX ENERGY CO.	BSPG	11003	1.87	2013	9999	32.238594	-103.63042
3002508162	PRE-ONGARD WELL #001	Plugged	PRE-ONGARD WELL OPERATOR	DEL	5020	1.87	1962	1962	32.204899	-103.65186
3002550364	HYPERION STATE COM #173H	Active	TAP ROCK OPERATING, LLC	BSPG	9569	1.88	2022	9999	32.208725	-103.58947
3002550360	HYPERION STATE COM #143H	Active	TAP ROCK OPERATING, LLC	BSPG	10537	1.88	2022	9999	32.208655	-103.58947
3002508163	ERNEST FEDERAL #001	Active	MARKS AND GARNER PRODUCTION LTD CO	DEL	4992	1.88	1962	9999	32.208523	-103.65292
3002550357	HYPERION STATE COM #103H	Active	TAP ROCK OPERATING, LLC	BSPG	9446	1.88	2022	9999	32.208725	-103.58939
3002550362	HYPERION STATE COM #153H	Active	TAP ROCK OPERATING, LLC	BSPG	11516	1.88	2022	9999	32.208655	-103.58939
3002543989	MAMBA 30 STATE #001	New	EOG RESOURCES	MONIT OR	0	1.88	2017	9999	32.188468	-103.60606
3002550358	HYPERION STATE COM #126H	Active	TAP ROCK OPERATING, LLC	BSPG	10866	1.90	2022	9999	32.208725	-103.58913
3002550366	HYPERION STATE COM #183H	Active	TAP ROCK OPERATING, LLC	BSPG	9975	1.90	2022	9999	32.208656	-103.58913
3002540571	EATA FAJITA STATE #003H	Active	COG PRODUCTION, LLC	BSPG	11127	1.90	2013	9999	32.225475	-103.59249
3002546319	DOS EQUIS 12 13 FEDERAL COM #003H	New	CIMAREX ENERGY CO.	BSPG/ WOLF	0	1.90	2023	9999	32.238754	-103.63158

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002546322	DOS EQUIS 12 13 FEDERAL COM #047H	New	CIMAREX ENERGY CO.	WOLF	0	1.90	2023	9999	32.238754	-103.63164
3002550120	DOS EQUIS 12 13 FEDERAL COM #048H	New	CIMAREX ENERGY CO.	WOLF	0	1.90	9999	9999	32.238754	-103.63171
3002541582	J KEATS 1 24 32 #040H	Active	CHEVRON MIDCONTINENT, L.P.	BSPG	11035	1.92	2014	9999	32.240421	-103.62106
3002524411	NEWMAN FEDERAL #001	Plugged	UNION OIL CO OF CALIFORNIA	DEL	5025	1.92	1973	1995	32.240421	-103.62083
3002541774	EATA FAJITA STATE COM #006H	Active	COG PRODUCTION, LLC	BSPG	9542	1.92	2015	9999	32.225475	-103.59219
3002527834	EXXON 23 FEDERAL #002	Active	3 Knights Operating LLC	DEL	5013	1.92	9999	9999	32.205803	-103.65292
3002550121	DOS EQUIS 12 13 FEDERAL COM #049H	New	CIMAREX ENERGY CO.	WOLF	0	1.92	9999	9999	32.238919	-103.63184
3002541055	ATOKA BANK BDJ STATE COM #002H	Active	EOG RESOURCES INC	BSPG	11159	1.92	2014	9999	32.224403	-103.59155
3002545142	HEARTTHROB 17 STATE COM #707H	Active	EOG RESOURCES INC	WOLF	12512	1.92	2018	9999	32.211844	-103.58844
3002550123	DOS EQUIS 12 13 FEDERAL COM #051H	New	CIMAREX ENERGY CO.	BSPG	0	1.92	9999	9999	32.238919	-103.63197
3002550124	DOS EQUIS 12 13 FEDERAL COM #052H	New	CIMAREX ENERGY CO.	BSPG	0	1.92	9999	9999	32.238918	-103.63203
3002545143	HEARTTHROB 17 STATE COM #708H	Active	EOG RESOURCES INC	WOLF	12534	1.93	2018	9999	32.211844	-103.58834
3002550361	HYPERION STATE COM #144H	New	TAP ROCK OPERATING, LLC	BSPG	0	1.95	2022	9999	32.208748	-103.58822
3002550365	HYPERION STATE COM #174H	New	TAP ROCK OPERATING, LLC	BSPG	0	1.95	2022	9999	32.208680	-103.58822
3002550363	HYPERION STATE COM #154H	New	TAP ROCK OPERATING, LLC	BSPG	0	1.95	2022	9999	32.208748	-103.58814

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002547141	HEARTTHROB 17 STATE COM #205H	Active	EOG RESOURCES INC	BSPG	9632	1.95	2021	9999	32.223054	-103.59017
3002550359	HYPERION STATE COM #128H	New	TAP ROCK OPERATING, LLC	BSPG	0	1.96	2022	9999	32.208679	-103.58813
3002540793	DOS EQUIS 12 FEDERAL COM #004H	Active	CIMAREX ENERGY CO.	BSPG	10933	1.96	2013	9999	32.238586	-103.63469
3002547142	HEARTTHROB 17 STATE COM #206H	Active	EOG RESOURCES INC	BSPG	9968	1.96	2021	9999	32.223054	-103.59011
3002508140	WIMBERLY #001	Plugged	PRIMAL ENERGY CORPORATION	DEL	5091	1.96	1962	2000	32.234016	-103.64323
3002548388	HEARTTHROB 17 STATE COM #103H	Active	EOG RESOURCES INC	BSPG	9496	1.96	2021	9999	32.223054	-103.59006
3002547144	HEARTTHROB 17 STATE COM #208H	Active	EOG RESOURCES INC	BSPG	9925	1.97	2021	9999	32.223054	-103.58996
3002548389	HEARTTHROB 17 STATE COM #104H	Active	EOG RESOURCES INC	BSPG	9485	1.97	2021	9999	32.223054	-103.58991
3002546318	DOS EQUIS 12 13 FEDERAL COM #001H	New	CIMAREX ENERGY CO.	BSPG/ WOLF	0	1.98	2023	9999	32.238545	-103.63562
3002546321	DOS EQUIS 12 13 FEDERAL COM #008H	New	CIMAREX ENERGY CO.	WOLF	0	1.98	2023	9999	32.238543	-103.63568
3002550135	DOS EQUIS 12 13 FEDERAL COM #009H	New	CIMAREX ENERGY CO.	WOLF	0	1.98	2023	9999	32.238545	-103.63575
3002541437	HYPERION STATE COM #003H	Active	TAP ROCK OPERATING, LLC	BSPG	11059	1.99	2014	9999	32.196453	-103.59311
3002524303	GULF NW STATE #001	Plugged	ADAMS OIL & GAS PRODUCERS	DEL	5160	1.99	1972	2002	32.241329	-103.61763
3002546884	GHOST RIDER 22 15 FEDERAL COM #101H	Active	APACHE CORPORATION	BSPG	9934	1.99	2020	9999	32.216788	-103.65489
3002550386	DOS EQUIS 12 13 FEDERAL COM #011H	New	CIMAREX ENERGY CO.	WOLF	0	1.99	9999	9999	32.238710	-103.63594

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002545318	MAMBA 30 STATE COM #706H	Active	EOG RESOURCES INC	WOLF	12507	2.00	2018	9999	32.184326	-103.61374
3002545319	MAMBA 30 STATE COM #707H	Active	EOG RESOURCES INC	WOLF	12466	2.00	2018	9999	32.184259	-103.61395
3002524717	PRE-ONGARD WELL #001	Plugged	PRE-ONGARD WELL OPERATOR	DEL	5117	2.00	1974	1979	32.241322	-103.62617



#### Surface Owners

#### Versado Gas Processors, L.L.C.

KE Andrews & CO 2424 RIDGE RD Rockwall, TX 75087

- Property Code. 4000051757005
- 80.00 AC being S2S2 located in T24S, R32E, Sec13

#### NGL North Ranch LLC

6120 S Yale Ave Suite 805 Tulsa, OK 74136

- Property Code 4980808100234
- 65.35 AC being S2S2 located in T24S, R32E, Sec13
- Less 14.65 AC dedicated to NMDOT for NM 128
- Property Code 4000051757004
- 258.15 AC being W2W2, S2SE4, SE4SW4 located in T24S, R32E, Sec14
- Less 21.85 AC dedicated to NMDOT for NM 128
- Property Code 4 4000051757002
- 155.54 AC being E4NW4, N2NE4, SE4NE4 located in T24S, R32E, Sec23
- Less 4.44 AC dedicated to NMDOT for NM 128
- Property Code 4 4000051757001
- 68.06 AC being N2, N2S2 located in T24S, R32E, Sec 24
- Less 11.94 AC dedicated to NMDOT for NM 128

#### New Mexico Department of Transportation

1120 Cerrillos Road P.O. Box 1149 Santa Fe, NM 87504-1149 Phone (505) 795-1401

> Lands in T24S, R32E with 14.65ac in sec 13, 21.85ac in sec 14, 4.44ac in sec 23, 11.94ac in sec 24

> > 4605 Post Oak Place, Suite 221, Houston, TX 77027

• • •



#### State of New Mexico

State Land Office 310 Old Santa Fe Trail, Santa Fe NM 87501 Mailing Address: P,O. Box 1148, Santa Fe, NM 87504 505-827-5760 505-827-5766 (Fax)

• Lands in T24S, R32E Sections 12 and 24

#### **United States Bureau of Land Management**

New Mexico State Office 301 Dinosaur Trail Santa Fe, NM 87508 United States Phone: 505-954-2222

• Lands in T24S, R32E Sections 13 and 14 and T24S, R33E Sections 7, 18 and 19

4605 Post Oak Place, Suite 221, Houston, TX 77027

.



#### **Operators**

#### **Cimarex Energy Co.**

6001 Deauville Blvd 300N Midland, TX 79706 Main Phone: 432-571-7800

• Operations in T24S, R32E Sections 12,13, and 14

#### **Finaly Resources LLC**

16585 PCH Suite 324 Sunset Beach, CA 90742 Main Phone: 562-881-0975

• Operations in T24S, R32E Section 13

#### **COG Production**, LLC

One Concho Center 600 W. Illinois Ave Midland, TX 79701 Main Phone: 432-683-7443 Main Fax: 432-687-8013

> Operations in T24S, R32E Section 23 and in T24S, R33E Section 7

#### **Devon Energy Production Co, LP**

333 W. Sheridan Ave Oklahoma City, OK 73102 Phone Main: (405)235-3611 Phone: (405) 228-4800

• Operations in T24S, R32E Sections 24 and 13, and in T24S, R33E Section 19



Oxy USA, Inc. Oil & Gas Royalty Interest Owners Attn: Land Administration P.O. Box 27570 Houston, TX 77227-7757 Phone: (713) 215-7231

• Operations in T24S, R33E Section 18

#### NGL Water Solutions Permian, LLC

865 North Albion Street Suite 400 Denver, CO 80220 Main Phone: 303-815-1010 Main Fax: 303-815-1011

• Operations in T24S, R32E Section 24

4605 Post Oak Place, Suite 221, Houston, TX 77027

.



#### Working Interest Owners

Cimarex Energy Co. 6001 Deauville Blvd. Suite 300N Midland, Texas 79706 Phone: (432) 571-7800

Magnum Hunter Production Inc. 840 Gessner Rd Suite 1400 Houston, TX 77024

#### **Chevron USA Inc**

6001 Bollinger Canyon Road San Ramon, CA 94583, USA Phone: (925) 842-1000

Chevron Midcontinent LP 6301 Deauville Blvd Midland, Tx 79706 Phone: (432) 687-7723

#### **Devon Energy Production Co. LP**

333 W. Sheridan Ave Oklahoma City, OK 73102 Phone Main: (405)235-3611 Phone: (405) 228-4800

#### **Conoco Phillips Company**

P.O. Box 2197 Houston, Texas 77252-2197

#### **Conoco Phillips Company**

315 S Johnstone Bartlesville, OK 74005-7500

#### **Canaan Resources Drilling Company, LLC**

1101 N Broadway #300 Oklahoma, City 73103



#### Oxy USA, Inc.

Attn: Land Administration P.O. Box 27570 Houston, TX 77227-7757 Phone: (713) 215-7231

#### Finaly Resources LLC 16585 PCH

Suite 324 Sunset Beach, CA 90742 Main Phone: 562-881-0975

#### **Cumberland Properties, Inc.** 3909 W Industrial Midland, TX 79703

#### **OVINTIV**

4 Waterway Square Pl Suite 100 The Woodlands, TX 77380-2764

#### Rover Operating LLC 17304 Preston Rd Suite 740 Dallas, TX 75252-4645

#### **Royalty Holding Co**

3535 NW 58th St #720 Oklahoma City, OK 73112 https://www.royaltyholdingcompany.com/contact-us

#### **XTO Holdings, LLC**

22777 Springwoods Village Pkwy Spring, Texas 77389 Phone (817) 870-2800 Fax: (817) 870-1671



COG Production, LLC One Concho Center 600 W. Illinois Ave Midland, TX 79701 Main Phone: 432-683-7443 Main Fax: 432-687-8013

COG Operating LLC 600 W. Illinois Avenue Midland, Texas 79701

Concho Oil & Gas LLC 600 W. Illinois Avenue Midland, Texas 79701

Pitch Energy Corp PO Box 304 Artesia, NM 88211-0304

SMC Oil & Gas, Inc. 6800 Gateway East Suite 1B El Paso, TX 79915 Phone: (800) 762-7621

#### **Allar Company**

735 Elm St. P.O. Box 1567 Graham, Tx 76459 Phone: (940) 549-0077 jack@allarcompany.com

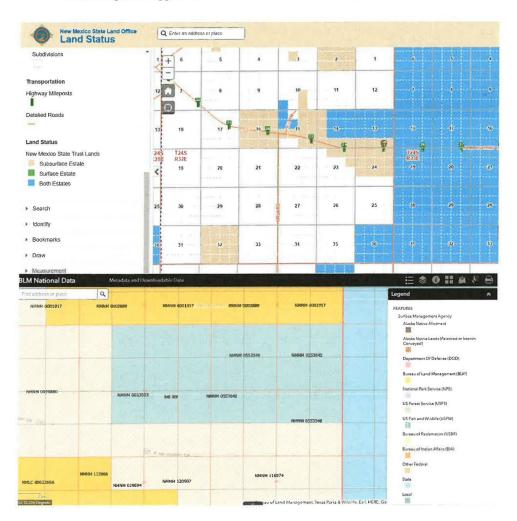
#### **Shepherd Royalty**

5949 Sherry Lane Suite 1175 Dallas, Tx 75225



#### Mineral Interest Owner(s) for unleased tracts

Based on United States Bureau of Land Management maps, New Mexico Land Status Maps, Lea County Records, BLM Records and The State of New Mexico Land Office records, the State of New Mexico and the United States Bureau of Land Management appear to own all mineral interests in subject lands.



## ATTACHMENT IV - RESERVOIR MODELING

## RESERVOIR MODELING

## OVERVIEW

Numerical simulations of dynamic reservoirs are carried out on a detailed geological model to facilitate the disposal authorization for Copperhead AGI #001. These models project the injectivity of the well, its pressure dynamics, and the movement of the AGI plume. The chosen depth for acid gas injection is at approximately 17,299-18,689 ft MD. The target injection zone includes the Thirtyone, Wristen, and Fusselman formations.

## INPUTS AND ASSUMPTIONS

In this study, we employed advanced software tools for the construction of geological and reservoir simulation models. Schlumberger's Petrel<sup>®</sup> software (Version 2023.3) was utilized for developing the geological models, while reservoir simulations were conducted using Computer Modeling Group (CMG)'s CMG-GEM<sup>®</sup> (Version 2024.10). CMG-WINPROP<sup>®</sup> (Version 2023.30) was used to perform PVT calculation through Equation of States and properties interactions among various compositions to feed the hydrodynamic modeling performed in CMG-GEM<sup>®</sup>. The treated acid gas (TAG) involved in the injections was modeled with the potential to exist in both dissolved and supercritical states within the aqueous and gaseous phases, respectively.

The construction of the static model was based on well logs and formation tops, aiming to accurately characterize and map the structural layers of the caprock. The geological model covers an area of approximately 3.1 by 3.2 miles, represented in a gridded format comprising 164 x 167 x 39 cells, totaling 1,068,132 cells. The grid size in the actively injected areas averages 100 by 100 square feet. **Figures IV-1** through S3 provide detailed visualizations of the model, including a map view (**Figure IV-1**), a 3D representation of the simulation model (**Figure IV-2**), and estimates of porosity and permeability based on available data from well logs (**Figure IV-3**). In the model, the range of the porosity is between 0.1 to 8.99 %. The permeability is interpolated between 0.001 to 3.40 millidarcy (mD), and the vertical permeability anisotropy is 0.1 (**Figure IV-3**).

For initialization of the reservoir simulations, several parameters and assumptions were considered. The connate water saturation of the storage reservoir was conservatively set at 100 %, with a residual water saturation of 55 % as per established sources (Jenkins, 1961; Bennion and Bachu, 2005). The initial salinity was assumed at 83,198 ppm, an average derived from measurements in three nearby wells, and the well data is from U.S. Geological Survey National Produced Waters Geochemical Database (ver. 3.0, December 2023) (Blondes et al., 2023). Following industry standards and data from drill stem tests in the Delaware Basin, a pore pressure gradient of 0.45 psi/ft was estimated, establishing a reservoir pressure of 7,750 psi at the top of the Thirtyone-Wristen formation at the initiation phase.

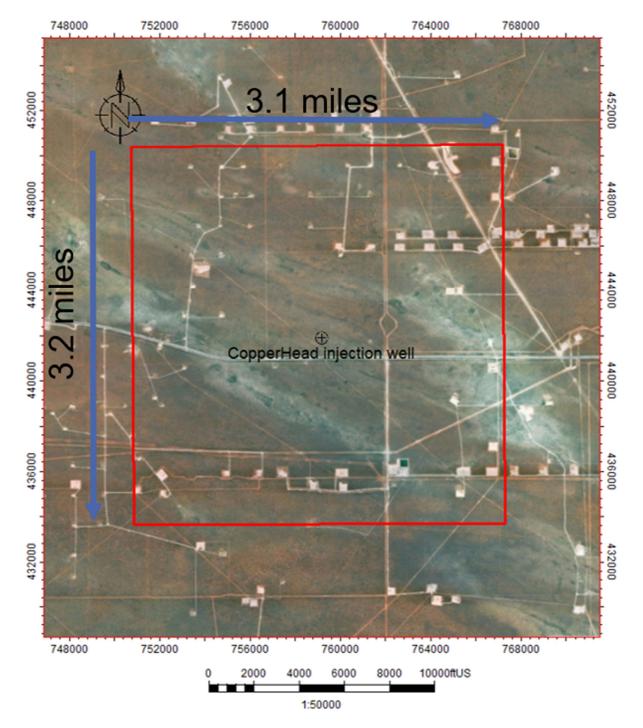


Figure IV-1. Map view of the simulation model of the Copperhead AGI #001

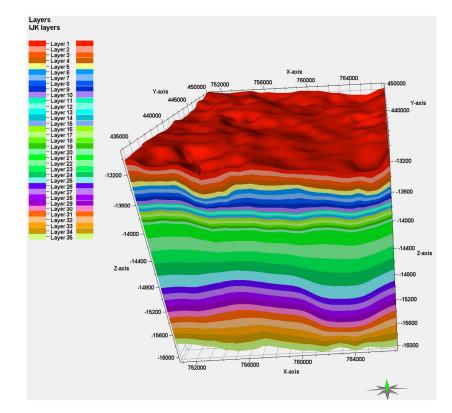


Figure IV-2. 3D view of the simulation model of the Copperhead AGI #1 containing Barnett, Mississippian, Woodford, Thirtyone, Wristen, Fusselman, Montoya formations. Color legends represent the layers.

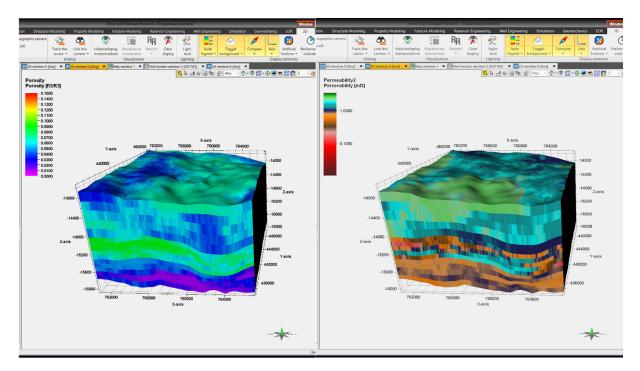


Figure IV-3. Porosity (left) and permeability (right) estimation of the storage zone (Thirtyone, Wristen, and Fusselman formations).

The fracture gradient (FG) for the injection interval was calculated using Eaton's formula, which characterized the formation lithology from Poisson's ratio and stress ratio value:

FG=1-OBG-pp+pp

Where,

is the Poisson's ratio,

OBG is the overburden gradient,

pp is the pore pressure gradient

An overburden gradient of 1.05 psi/ft is typically used in calculations when no site-specific data is available (Luo et al., 1994). Poisson's ratio was assumed to be 0.3 for the injection layer, with a variation between 0.29 and 0.31 to account for uncertainties (Smye et al., 2021; Dvory and Zoback, 2021). The fracture gradient was estimated to be 0.65 to 0.68 psi/ft (Dvory and Zoback, 2021). This led to a calculated bottom hole formation fracture pressure of 10,370 psi. Furthermore, a safety margin of 10% was applied to this fracture gradient to prevent the bottom hole injection pressure (BHP) during active injection from surpassing the fracture gradient, setting the maximum BHP at 0.59 psi/ft in simulations. The geomechanical properties of the reservoir are detailed in **Table IV-1**. These parameters, derived from existing well logs and referenced literature, will be validated with actual measurements upon completion of the proposed, with subsequent updates to the modeling and simulation work as necessary.

Parameter	Upper Confining Zone	Injection Interval	Lower Confining Zone
Overburden Gradient (psi/ft)	1.05	1.05	1.05
Pore Pressure Gradient (psi/ft)	0.45	0.45	0.45
Poisson's Ratio	0.29	0.30	0.31
Fracture Gradient (psi/ft)	0.68	0.65	0.68
Fracture Gradient with 10% Safety Factor (psi/ft)	0.61	0.59	0.61

Table IV-1. Summary	/ of	parameters fo	or the cor	nfining zone	s and in	iection interval
Tubic IV 1. Summary		purumeters it		1111116 20110	5 ana m	jeenon miter var

The simulation at Copperhead AGI #001 is set to inject at the proposed average injection rate of 12 MMSCFD and the proposed maximum injection rate of 26 MMSCFD. A maximum allowable surface injection pressure (MAOP) calculated by the NMOCD approved method and bottom hole pressures of 5,160 psi and 10,370 psi, respectively, are set, with an injection composition of 30% H2S and 70% CO2.

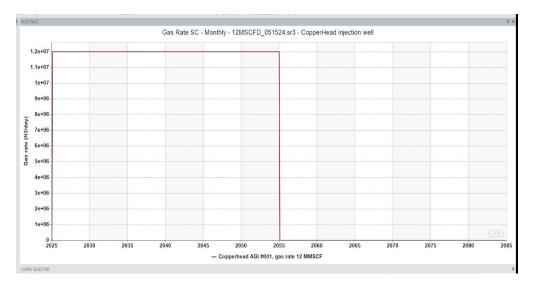
The simulation begins on January 1, 2025, and concludes on January 1, 2085, encompassing a 30-year active injection phase followed by a subsequent 30-year post-injection monitoring phase to estimate the maximum impacted area.

Table IV-2. Well operations input of reservoir simulation

Well Name	Injection Starting Date	Shut-In Date	Injection Rate
Copperhead AGI #001	2025	2055 (expected)	12 MMSCFD (Surface condition)
Copperhead AGI #001	2025	2055 (expected)	26 MMSCFD (Surface condition)

### MODEL OUTPUTS

The injection rate profiles for Copperhead AGI #001 suggests the consistent proposed rates, as depicted in **Figure IV-4**. The consistent rate of both 12 MMSCFD and 26 MMSCFD ensures that the target formations can safely receive the treated acid gas (TAG) from Copperhead #001 over a 30-year period while adhering to the pressure constraints and maintaining formation integrity.



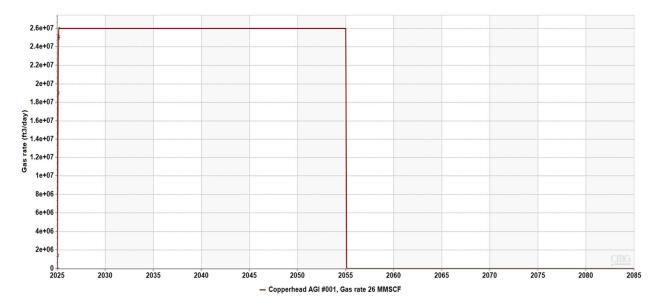


Figure IV-4. Forecast of TAG injection rate of Copperhead AGI #001 at 12MMSCFD (top) and 26 MMSCFD (bottom)

#### TAG PLUME

**Figure IV-5** captures the evolution of the TAG plume for Copperhead AGI #001 at various stages: 5, 10, 15, 20, 25, and 30 years' post-injection commencement in 2025, with the largest part of the plume estimated to span 3,832 ft (0.73 miles) with 12 MMSCFD and 5,362 ft (1.02 miles) with 26 MMSCFD. The dashed lines in the figure delineate the plume boundary at these specified intervals.

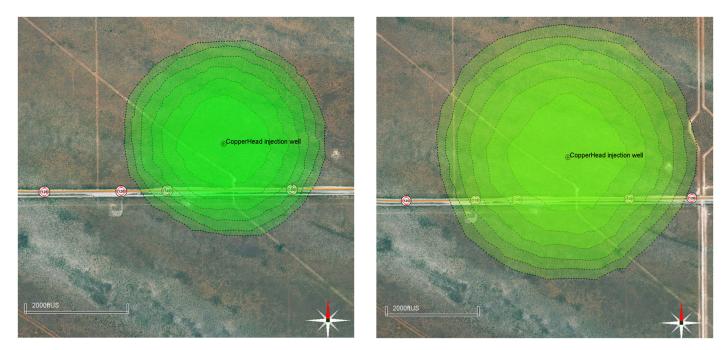


Figure IV-5. Extent of TAG plume (represented by gas saturation) at years 2030, 2035, 2040, 2045, 2050, and 2055 (end of injection) in map view at 12 MMSCFD (left) and 26 MMSCFD (right). Dashed lines represent plume boundary at these time intervals.

#### **PREDICTED BOTTOM HOLE PRESSURES**

The maximum and average wellhead pressures were determined from the simulation output by CMG-GEM (GEM). GEM uses Equation-of-State (EOS) to compute the effects from the tubing size and calculate friction losses of the phase behavior and fluid properties of the flowing fluid. The input parameters for the wellbore model are summarized in **Table IV-3**. The prediction of the bottom hole and wellhead pressures are summarized in **Table IV-4** and displayed in **Figure IV-6**.

Wellbore Model	Values
Length, ft	17,299
Relative Roughness	0.001
Wellhead Temperature, °F	90
Bottomhole Temperature, °F	225
Tubing Size (OD), inch	3.5
Composition of injected gas	70% CO <sub>2</sub> /30% H <sub>2</sub> S
Density and Viscosity of injected gas	Dynamically Calculated by EOS

Table IV-3. Input parameters for Wellbore Model Pressure Calculations

#### Table IV-4. Summary of predicted injection pressures

Injection rate, MMSCFD	Average BHP, psi	Max BHP, psi	Average WHP, psi	Max WHP, psi
12	6,880	7,469	1,551	1,663
26	7,353	9,094	2,476	3,101

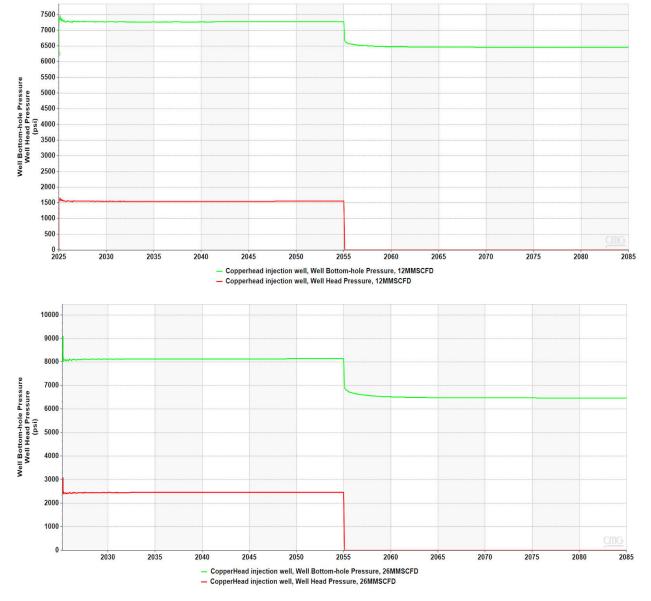


Figure IV-6 Bottom hole pressure (red) and wellhead pressure (green) of Copperhead AGI #001 at 12 MMSCFD (top) and 26 MMSCFD (bottom)

#### **Critical Pressure Front**

The base of the deepest underground sources of drinking water (USDW) at approximately 1,500 ft below the surface at the Copperhead AGI #1 area. As given by Nicot et al. (2008) and Bandilla et al. (2012), assuming (1) hydrostatic conditions and (2) initially linearly varying densities in the borehole and constant density once the injection-zone fluid is lifted to the top of the borehole (i.e., uniform density approach), the threshold pressure increase ( $\Delta P_c$ ) may be calculated:

$$\Delta P_c = \frac{1}{2}g \cdot \mathcal{E} \cdot (z_u - z_i)^2$$

where  $\boldsymbol{\xi}$  is a linear coefficient defined by:

$$\mathcal{E} = \frac{\rho_i - \rho_u}{(z_u - z_i)}$$

Where:  $\rho_u$  is the fluid density of the USDW,

 $\rho_t$  is the injection interval fluid density, g is the acceleration due to gravity,  $z_u$  is the representative elevation of the USDW,  $z_t$ 

 $z_{i}$  is the representative elevation of the injection interval

As shown in **Table IV-5**, the maximum allowable pressure elevation is 698 psi. **Figure VI-7** shows the pressure elevation at year 2055 (end of injection) on the top of Thirtyone formation. The center of pressure elevation created by Copperhead AGI #1 with 26 MMSCFD injection rate is the maximum pressure gain of 500 psi. This pressure increase is less than 698 psi, indicating the USDW will not be endangered from Copperhead AGI #1 injection.

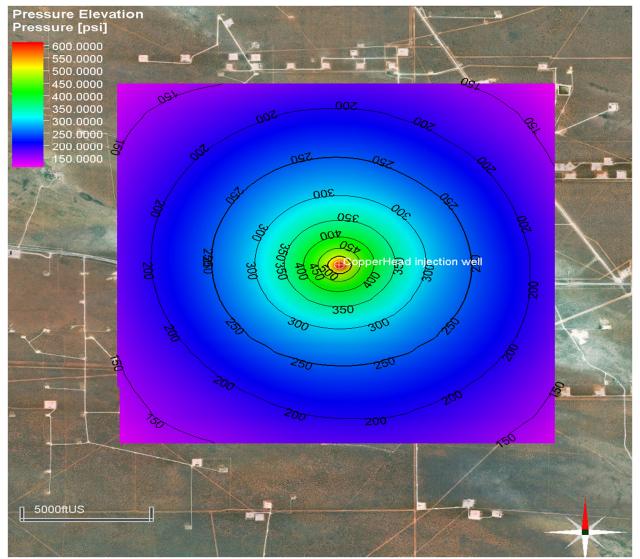


Figure IV-7 Pressure elevation in 2055 (end of injection) on the top of the Thirtyone formation

Table IV-5 – Summary of parameters for the USDW critical pressu	re calculations
---	-----------------

USDW	Fresh water	Brine	Brine	Top of	Admissible additional pressure
Base	density	Salinity	Density	Thirtyone	
1,500 ft	62.4 lbm/ft3	83,198 ppm	63.70 lbm/ft3	17,299 ft	698 psi

In summary, the review of reservoir engineering and numerical simulations indicates that the target formation can receive the TAG at the proposed average and maximum injection rates. The models confirm that the injection pressures will remain below the formation's fracture pressure, ensuring the

safe containment of the injected TAG within the designated injection and post-injection periods. The planned injection process is designed to facilitate sequestration while mitigating potential environmental impacts. This analysis relies on the best available estimates from existing legacy wells and referenced literature. After the proposed well is completed, formation properties will be assessed, and the study will be updated with site-specific data and the most recent legacy injection records before any TAG injection commences.

#### References

1. Jenkins R.E. 1961. Characteristic of the Delaware Formation.

2. Bennion, B., Bachu, S. 2005. Relative permeability Characteristics for Supercritical CO2 Displacing Water in a Variety of Potential Sequestration Zones in the Western Canada Sedimentary Basin. SPE 95547.

3. Luo, M., Baker, M.R., LeMone, V. 1994. Distribution and Generation of the Overpressure System, Eastern Delaware Basin, Western Texas and Southern New Mexico.

4. Dvory, N. Z., and Zoback, M. D. 2021. Prior Oil and Gas Production Can Limit the Occurrence of Injection-Induced Seismicity: A Case Study in the Delaware Basin of Western Texas and Southeastern New Mexico, USA. Geology 49 (10): 1198–1203.

5. Smye, K.M., Hennings, P.H., and Horne, E.A., 2021. Variations in vertical stress in the Permian Basin region. AAPG Bulletin, 105(10), pp. 1893-1907.

6. Nicot, J.P., Oldenburg, C.M., Bryant S.L., Hovorka, S.D. 2009. Pressure perturbations from geologic carbon sequestration: Area-of-review boundaries and borehole leakage driving forces. DOI: 10.1016/j.egypro.2009.01.009. (Note: please change this citation to Nicot et al. (2009) instead of (2008). 2008 was my typo.)

7. Bandilla, K.W., Kraemer, S.R., Birkholzer, J.T. 2021. Using semi-analytic solutions to approximate the area of potential impact for carbon dioxide injection. International Journal of Greenhouse Gas Control. https://doi.org/10.1016/j.ijggc.2012.02.009

 Blondes, M.S., Knierim, K.J., Croke, M.R., Freeman, P.A., Doolan, C., Herzberg, A.S., and Shelton, J.L., 2023, U.S. Geological Survey National Produced Waters Geochemical Database (ver. 3.0, December 2023): U.S. Geological Survey data release, https://doi.org/10.5066/P9DSRCZJ.

## ATTACHMENT V – GROUNDWATER ANALYSES

There are two Targa water wells located in this region. The water samples provided were taken on July 31<sup>st</sup>, 2023, from groundwater wells C-03666 POD1 and C-03917 POD1 which are both less than 6 miles from the Copperhead AGI #1 well. The sampling and analyses provided were all done in-house at New Mexico Tech.

For these water wells, 1-L washed Nalgene bottles were triple-rinsed with well water and filled. Samples were temperature regulated prior to the general chemistry analysis. The water is basic with pH of 8 to 9 and calculated TDS of 453 to 1,380 mg/L. The conductivity ranges from 757 to 2,066 us/cm.

GENERAL CHEMISTRY ANALYSES		
Customer name	Tianguang Fan	
Company	New Mexico Tec	h
Address	801 Leroy Place	
City, State, Zip code	Socorro NM 878	01
Phone	(575) 835-5542	
Email	Tianguang.Fan@	nmt.edu
Date sampled	7/31/2023	
Date completed	8/30/2023	
Analyte	C-03666	C-03917
рН	8.5	8.2
Conductivity (uS/cm)	757.0	2,066.0
Alkalinity as CO₃² (mg/L)	4.0	
Alkalinity as HCO <sub>3</sub> (mg/L)	287.9	97.6
Chloride (mg/L)	15.0	191.4
Fluoride (F) (mg/L)	ND	ND
Bromide (Br) (mg/L)	ND	1.5
Nitrate (NO <sub>s</sub> ) (mg/L)	ND	ND
Phosphate (mg/L)	ND	ND
Sulfate (SO42) (mg/L)	106.0	666.2
Lithium(Li) (mg/L)	0.1	0.2
Sodium (Na) (mg/L)	156.0	370.7
Potassium (K) (mg/L)	3.6	6.5
Magnesium (Mg) (mg/L)	15.0	33.9
Calcium (Ca) (mg/L)	12.9	62.7
TDS Calculation (mg/l)	150 6	1 270 6
TDS Calculation (mg/L)	452.6	1,379.6
Total cations (meq/L)	8.8	22.2
Total anions (meq/L)	-7.5	-20.9

Percent difference (%)	7.9	3.1
ORP (mV) IC (ppm) NPOC (ppm) ND, non-detectable.	292.7 69.8 0.6	294.2 23.0 0.4

## ATTACHMENT VI – SAMPLE NOTICE LETTER SAMPLE NOTICE LETTER

June XX, 2024

Sample Notice Letter

## VIA CERTIFIED MAIL RETURN RECEIPT REQUESTED

## TO ALL PARTIES ENTITLED TO NOTICE RE: TARGA MIDSTREAM SERVICES LLC PROPOSED COPPERHEAD AGI #1

This letter is to advise you that Targa Midstream Services LLC has filed the enclosed C-108 application (Application for Authorization to Inject) with the New Mexico Oil Conservation Division seeking authorization to drill and operate a Class II acid gas injection (AGI) well, the Copperhead AGI #1 well, at Targa Resources' gas processing facility in Lea County, New Mexico. In accordance with the requirements of the New Mexico Oil Conservation Division, you are being provided this notice and a copy of the complete application as you are an interested party within one (1) mile of the proposed AGI well location.

The proposed Copperhead AGI #1 will be a vertical well with a surface location of approximately 793 feet from the south line (FSL) and 429 feet from the east line (FEL) (Unit P) in Section 13, Township 24 South, Range 32 East, Lea County, New Mexico. As proposed, the Copperhead AGI #001 well will inject waste carbon dioxide and hydrogen sulfide into the Devonian formation from approximately 17,299 to 18,689 feet. The maximum surface pressure will not exceed 3,460 psi with a maximum daily injection volume of 26 million standard cubic feet (MMSCF).

This application (Case No. XXXXX) has been set for a hearing before the New Mexico Oil Conservation Commission at XX:XX am on XX, 2024. You are not required to attend this hearing, but as an owner of an interest that may be affected by this 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. Hearings are currently conducted in a hybrid fashion, both in-person at the Energy, Minerals, Natural Resources Department, Wendell Chino Building, Pecos Hall, 1220 South St. Francis Drive, 1st Floor, Santa Fe, NM 87505 and via the WebEx virtual meeting platform. To participate virtually, see the instructions posted on the OCD Hearings website: <a href="https://www.emnrd.nm.gov/ocd/hearing-info/">https://www.emnrd.nm.gov/ocd/hearing-info/</a>.

Pursuant to Division Rule 19.15.4.13.B, a party who intends to present evidence at the hearing shall file a pre-hearing statement and serve copies on other parties, or the attorneys of parties who

are represented by counsel, at least four business days in advance of a scheduled hearing, but in no event later than 5:00 p.m. Mountain Time, on the Thursday preceding the scheduled hearing date. The statement must be submitted through the OCD E-Permitting system (https://wwwapps.emnrd.nm.gov/ocd/ocdpermitting/) or via e-mail to ocd.hearings@emnrd.nm.gov 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 identification of any procedural matters that are to be resolved prior to the hearing.

If you have any questions concerning this application, you may contact Jimmy Oxford at 940-220-2493.

Sincerely,

<u>/s/ Dana S. Hardy</u> Counsel for Targa Midstream Services LLC





## Application for Authorization to Inject C-108 Application for Targa Northern Delaware LLC

## COPPERHEAD AGI #001 **PRESENTED IN HEARING BEFORE THE NEW MEXICO OIL CONSERVATION COMMISSION** CASE #24594 AUGUST 15, 2024

Prepared For: Targa Northern Delaware LLC Prepared By: New Mexico Institute Of Mining And Technology Petroleum Recovery Research Center Socorro, NM 87801

> Targa Midstream Services, LLC Case No. 24594 Exhibit B

## Witnesses and Outline of the Presentation



Matthew Eales Vice President Regulatory   Targa Resources	Describe the <b>overall Introduction</b> and benefits of Targa's Copperhead Gas Processing Plant and role of AGI project in gas plant operations
<i>George El-Kaseeh</i> * Research Engineer   PRRC   New Mexico Institute of Mining and Technology	Describe relevant <u>site geology and hydrogeology</u> , analyses of stratigraphy, paleogeography, seismicity, and all components of C-108 application.
<ul> <li>Industry Service group leader.</li> <li>Expert in Subsurface Project Management and Geophysics.</li> </ul>	Describe <b>reservoir dynamic simulations</b> completed to assess the impact of acid gas injection on the target Siluro-Devonian formations, the resultant acid gas plume, and the pressure profile.

## Paul Ragsdale

- Engineering Consultant | Operations Engineering & Oil and Gas
   Consulting
- *Expert in Drilling, Completions, and Production in Southeast NM.*

Describe the <u>wellbore design</u> capacity for AGI #001 well drilling, completion, operations, and monitoring plan. Schematic of the wellbore design, casing, tubing grades, and planned logging program.



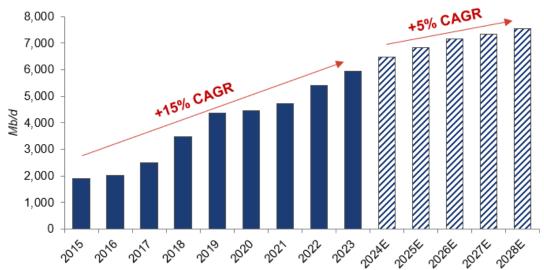
# Section I Overview of the Copperhead Area

*MATTHEW EALES VICE PRESIDENT REGULATORY* | *TARGA RESOURCES* 

## Permian Oil and Gas Volumes: Positioned for Continued Growth

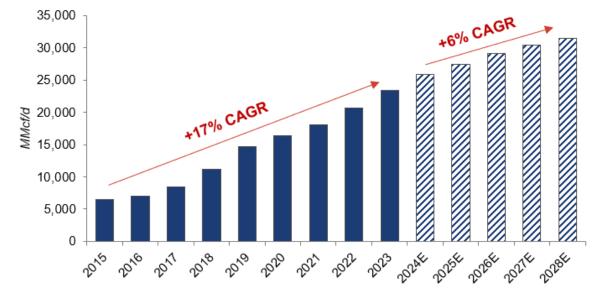


• Permian Basin is a world-class resource and one of the most economic producing basins in the world



Permian Crude Oil Production

- Permian oil production has increased 15% CAGR since 2015
- ~60% of US shale rig activity is focused in the Permian Basin
- Production growth outlook backed by attractive producer inventory and depth of inventory

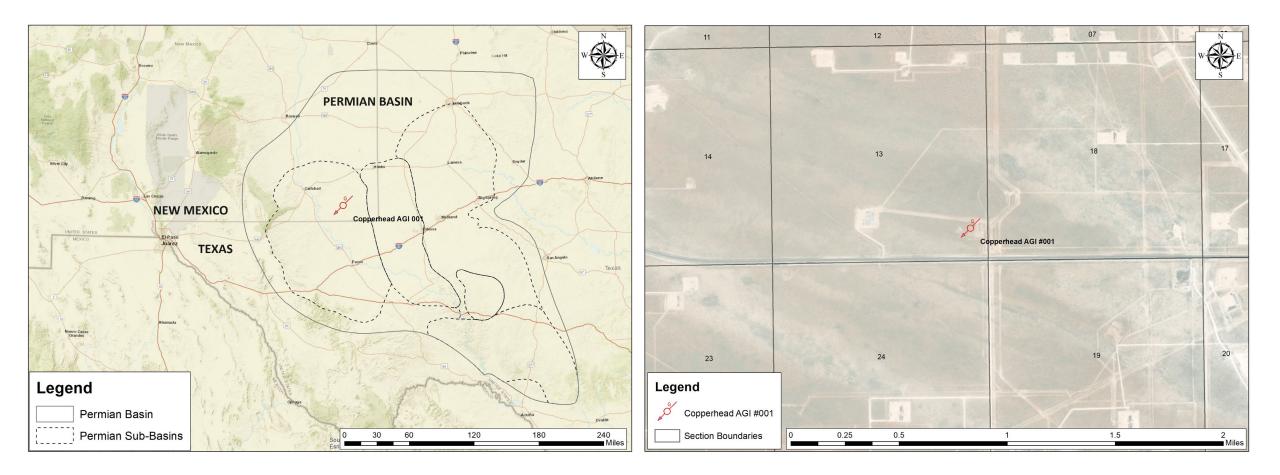


#### Permian Gross Natural Gas Production

- Permian gross gas production has increased 17% CAGR since 2015
- Robust GOR (gas-to-oil ratio) trend signals attractive associated gas
  production growth outlook

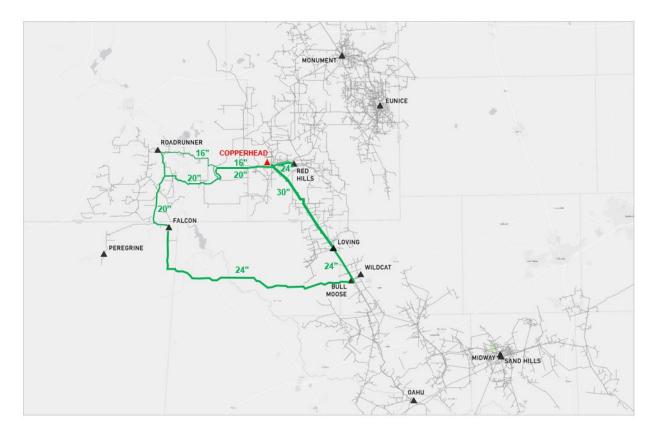
## **Copperhead Location**



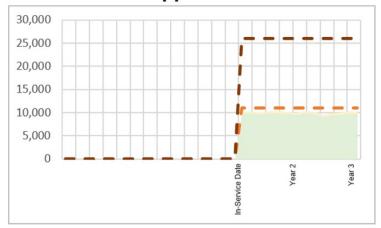


## Copperhead Area Gathering and Processing Needs





- Copperhead is currently a compression / gathering facility and is expanding into a gas processing plant.
- This AGI well is needed for the anticipated TAG resultant from sour gas treatment.



#### Copperhead



# Site Geology Review

*George El-Kaseeh* Research Engineer | PRRC | NEW MEXICO INSTITUTE OF MINING AND TECHNOLOGY Industry Service group leader

## Summary of Well Activity Near Proposed Injector Location



Well locations	within ½	mile								
Well API	Well Name	Well Type	Formation	Well Status	Operator	Spud	Plug	Notes	Wells within 2 miles of Copperhead AGI #001 Lea County, NM	Legend
3002508147	WOOLLEY #001	Oil	Brushy Canyo	n Plugged	Westates Petroleum Corp of Texas	1957	1957	DH 1957,TD Delaware 5063'	03 02 01 06 05 05 05 05 05 05 05 05 05 05 05 05 05	1 mile radius     half mile radius Copperhead Wells     Oil, Active
3002546109	MCCLOY CENTRAL SWD #001	SWD	Devonian- Silurian	New	NGL Water Solutions Permian,LLC	NA	NA	APD filed 6/13/2019, expired 6/13/2021	3002540193 3002540193 3002524437 3002508140 3005534123 3002524450 3002524483 3002528488 3002539883 08 10 3002508142 3002508142 3002529180 3002508368 07 3002508140 3002525180 300250836 07 3002525180 3002524431 300252431 300254253 300254253 3002524437 300254457 300252431 300254253 300254253	Oil, Plugged     Oil, ND     Oil, New     Oil, New     Gas, Active     Gas, Plugged
Radius distance from location (mi)	Active	2	New	lugged, site released	Total				Accessor         Storestige         Storestig	SWD, Active SWD, Plugged SWD, New Copperhead Facility
½-mile	0		1	1	2				3002527754 3002548663 500255035	Proposed AGI Well
1-mile	10		4	2	16				3002548763 3002546379 3002546380 3002566766 3002550356 3002550366	Surface Management

• Over 90% of the wells within the 2-mile radius are oil wells drilled to either Bone Spring (83) or Wolfcamp (46) reservoirs

56

61

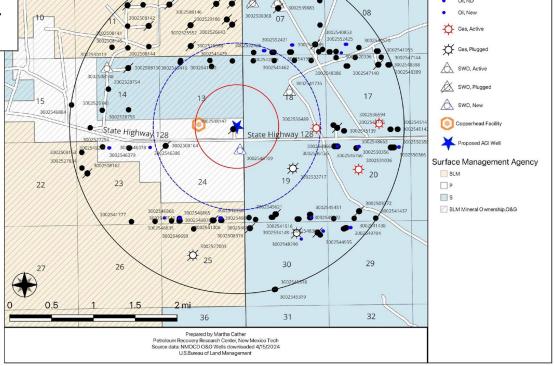
29

32

219

237

- The remainder are drilled to the Delaware or Atoka/Morrow
- No wells produce from the proposed injection zone anywhere within the 2-mile radius.



2-miles

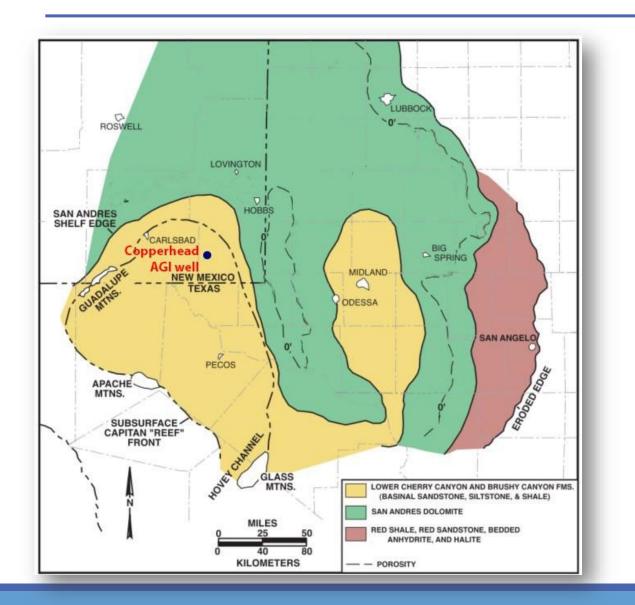
Total

134

144

### **Proposed Injector Location**



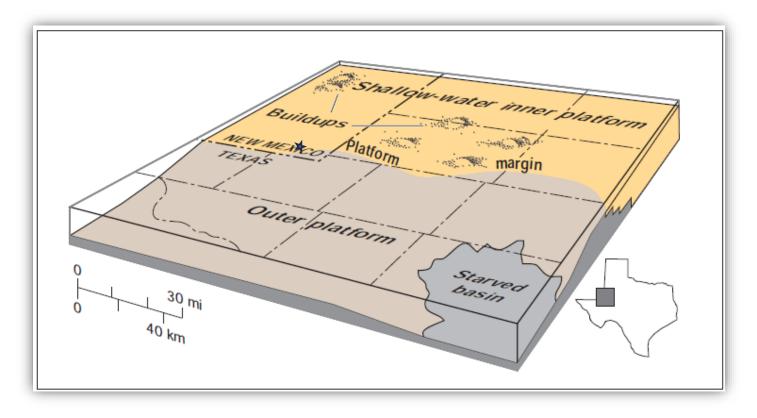


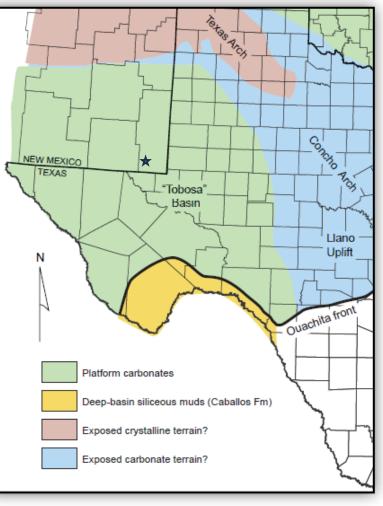
- The area is in the northeastern part of the present-day Delaware Basin within the greater Permian Basin area
- The units were deposited within the Tobosa Basin
- The geologic model is based on both well logs and purchased 3-D seismic for the greater Copperhead area

## Paleogeography & Depositional Environments

Page 79 of 162 M New Mexico Tech Petroleum Recovery Research Center

- Model is for the Silurian Tobosa Basin
- Copperhead area is on a shallow-water high-energy carbonate platform





<sup>\*</sup> Diagram is from Ruppel (2019)

## Stratigraphy Of The Proposed Injection Zone



## The **Siluro-Devonian (Thirtyone & Wristen)** and **Fusselman** section:

- Consists of interbedded limestones and dolomites with minor sandstone and shale interbeds
- Zones with good porosity and permeability are related to primary porosity within the carbonates and secondary porosity within solution-enlarged pores and breccia
- The proposed injection zone is capped by 140- to 180-feetthick, Devonian Woodford Shale followed by 480- to 675feet-thick section of Mississippian limestones and shales. These units have negligible porosity and permeability

AC	GE	CENTRAL BASIN PLATFORM- NORTHWEST SHELF	DELAWARE BASIN	
	Missourian	Canyon Formation	Canyon Formation	
Pennsylvanian	Des Moinesian	Strawn Formation	Strawn Formation	
	Atokan	Atoka Formation	Atoka Formation	
	Morrowan	Morrow Formation	Morrow Formation	
	Upper	Barnett Shale	Barnett Shale	
Mississippian	Lower	"Mississippian limestone"	"Mississippian limestone"	
	Upper	Woodford Shale	Woodford Shale	
Devonian	Middle			
	Lower	Thirtyone Formation	Thirtyone Formation	
	Upper	Wristen Group	Wristen Group	
Silurian	Middle			
	Lower	Fusselman Formation	Fusselman Formation	
	Upper	Montoya Group	Montoya Group	
Ordovician	Middle	Simpson Group	Simpson Group	
	Lower	Ellenburger Group	Ellenburger Group	
Cambrian		Bliss Sandstone	Bliss Sandstone	
Precambrian		Miscellaneous igneous, metamorphic, volcanic rocks	Miscellaneous igneous, metamorphic, volcanic rocks	

Stratigraphic column for the Delaware basin, the Northwest Shelf and Central Basin Platform (modified from Broadhead, 2017).

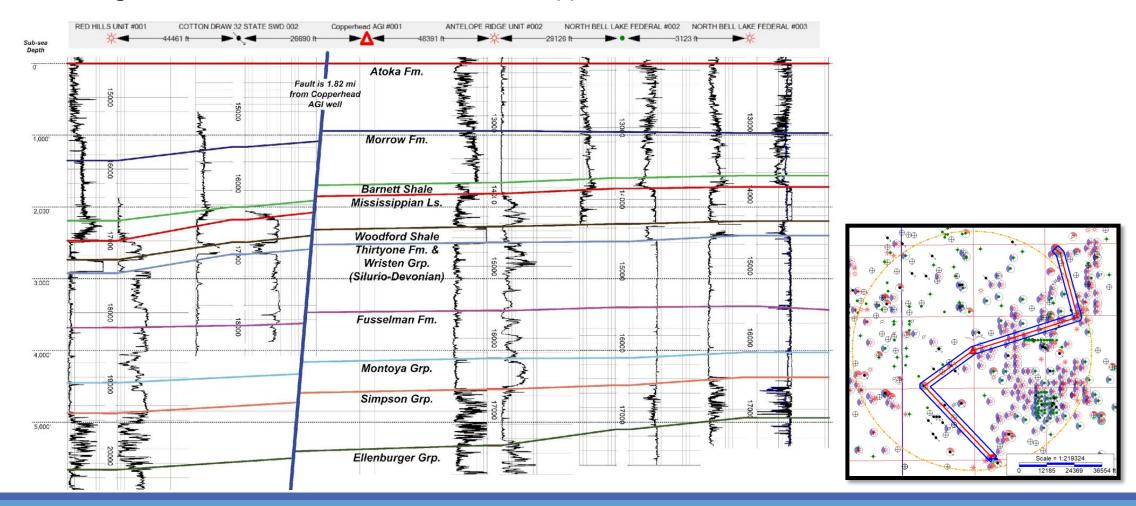
11

#### Received by OCD: 8/8/2024 3:59:15 PM

#### Stratigraphy and Cross Section



- Siluro-Devonian strata: ~1,380 ft of Thirtyone, Wristen and Fusselman limestones and dolomites
- Confining Zone: ~780 ft of Barnett Shale, Mississippian limestones, and Woodford Shale

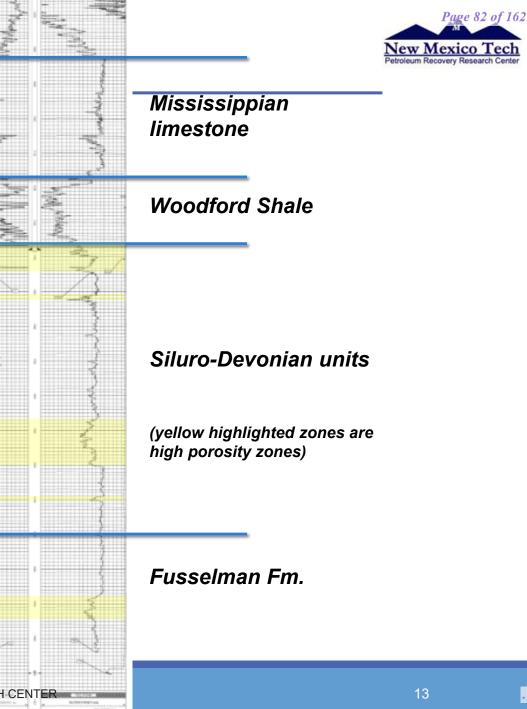


#### Received by OCD: 8/8/2024 3:59:15 PM

## Petrophysical properties

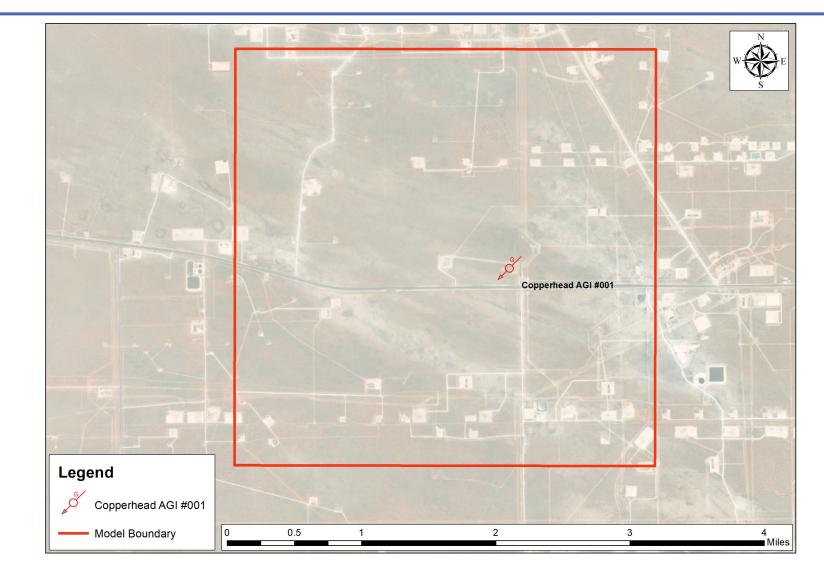
- The closest deep well with log data (4.4 mi) to the proposed well is Cyclone Federal SWD #001
- The majority of the porosity within the section is confined to horizons (possibly karsted intervals) shown in yellow
- Maximum measured porosity of ~10% is in the both the Siluro-Devonian and **Fusselman** section
- Woodford, Mississippian and Barnett are the confining zones







## Model Boundary

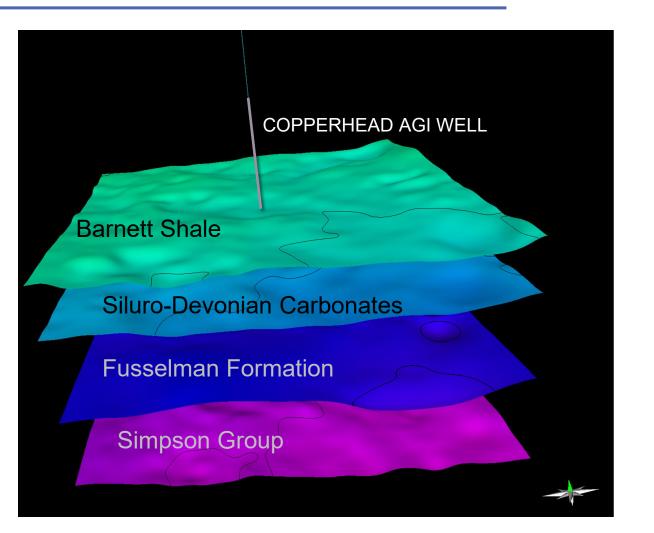


.

## Seismic Interpretation

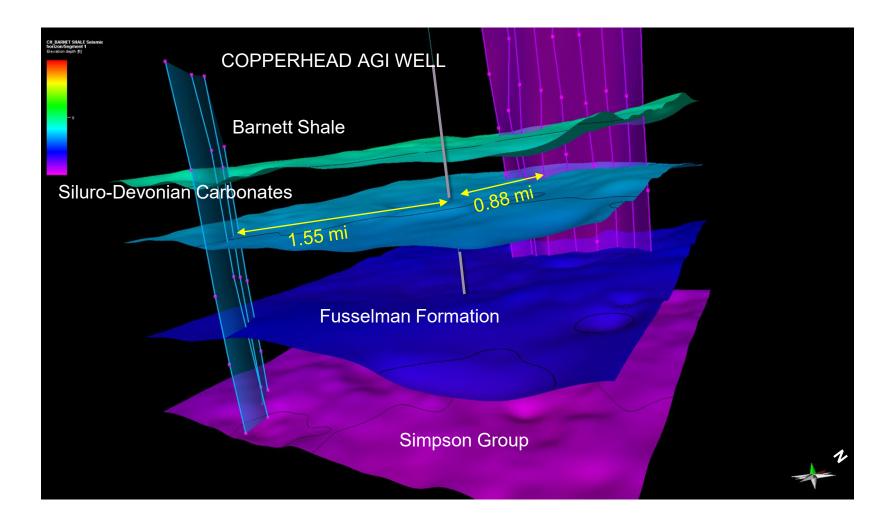


- Formation tops based on the Copperhead 3-D seismic and well logs
- The Barnett Shale is the uppermost confining zone (Woodford Shale + Mississippian limestone + Barnett Shale)
- The Siluro-Devonian (Thirtyone Fm. + Wristen Group) through the Fusselman Formation is approximately 1,400 ft



#### Faults in the Seismic Area

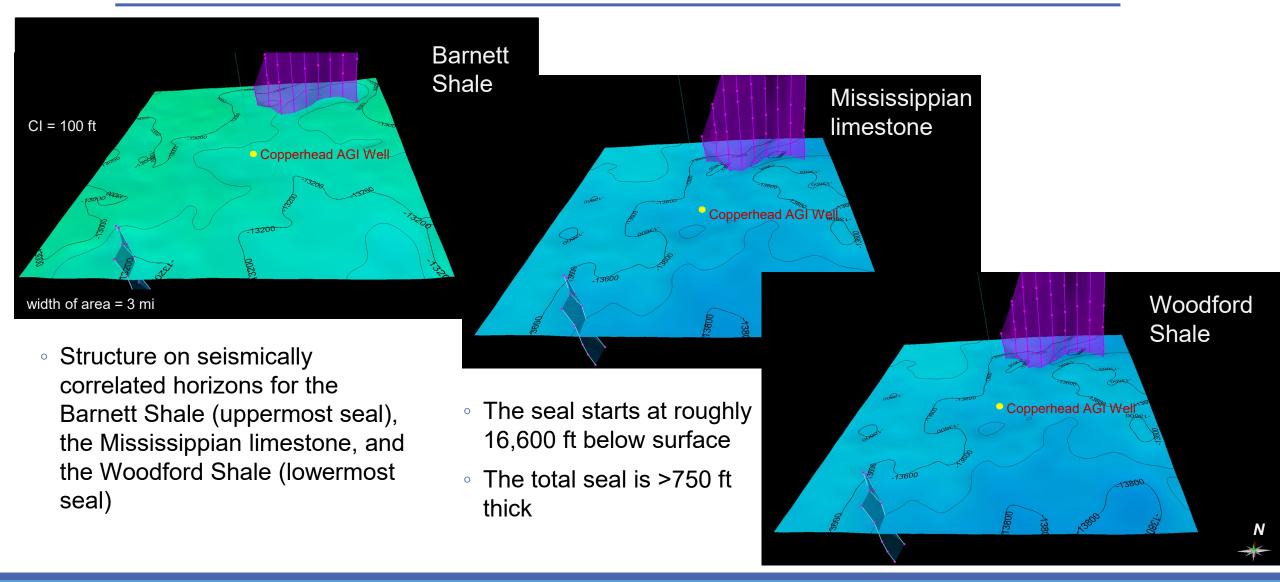




- Two faults with minor displacement pass through the proposed interval in the the area of investigation
- The closest fault is 0.88 mi away from the well, the other 1.55 mi
- Faults terminate in the lower Wolfcamp (roughly 2,000 ft above the Barnett Shale)

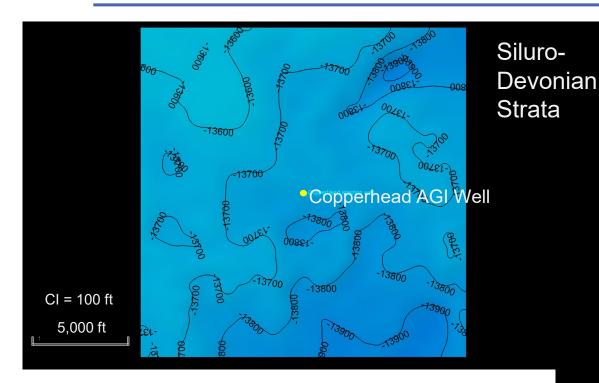
## Received by OCD: Subsea Structure Maps – Confining Zone (Mississippian - Woodford)



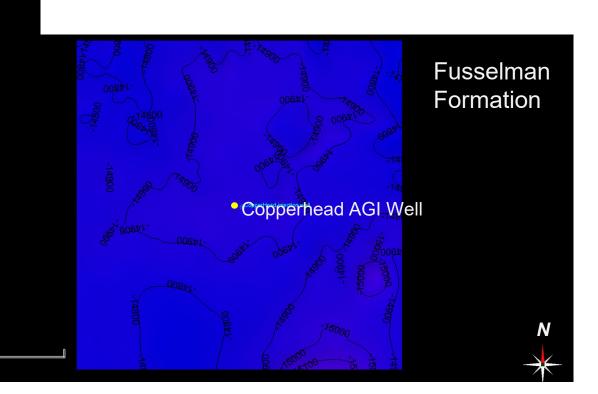


### Received by OCD Subsea Structure Maps – Injection Zone (Siluro-Devonian – Fusselman)





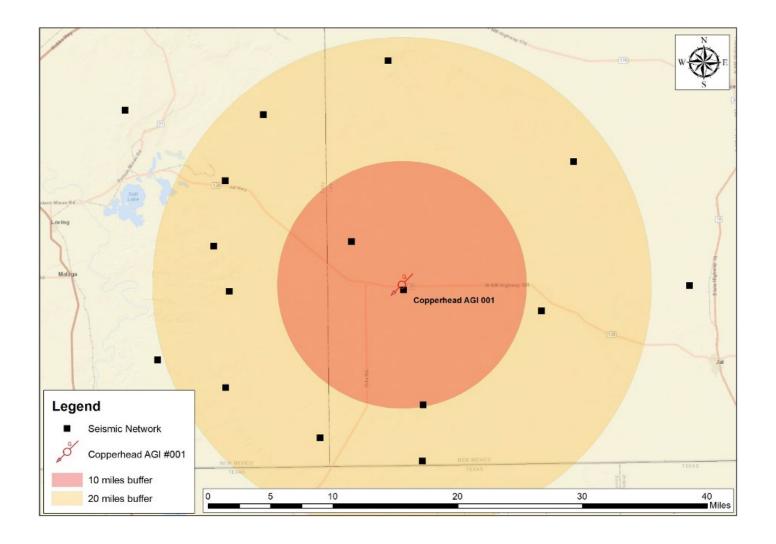
 Structure on seismically correlated horizons for the Siluro-Devonian and Fusselman



5000ftUS



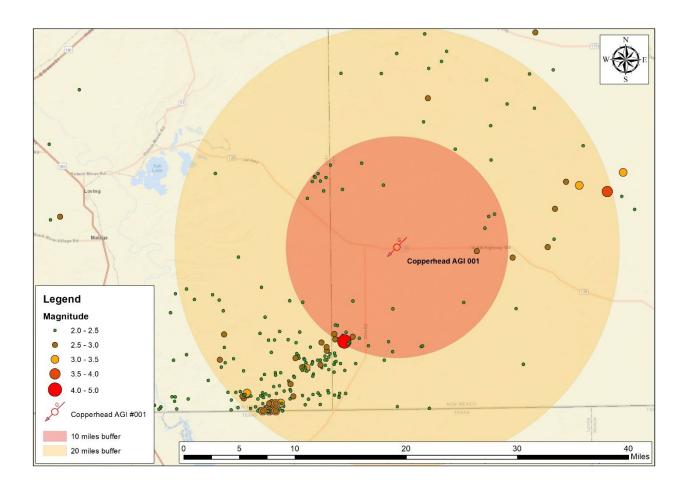
## Seismic monitoring network around the Copperhead Area



- Monitoring stations from the New Mexico Tech Seismological Observatory
- All data are freely available online

## Seismicity within 20 miles of the Copperhead AGI site





Data from New Mexico Tech Seismological Observatory and USGS databases, showing all events of magnitude 2.0 or greater. Circles show 10- and 20-mile radii. Data for the period 1/12/17 to 4/12/2024.

- Events ranged from M 2.0 M 4.03
- The closest event to the Copperhead AGI well was a M 2.0 event, 8.3 mi from location
- The largest event was M 4.03 event, approximately 9.7 mi from location
- All other events within 10-mile radius are M 3.0 or less
- Most events within a 20-mile radius are clustered to the southwest of the location, with the majority at almost 20 miles away.



# Section III Reservoir Dynamic Simulation

*George El-Kaseeh* Research Engineer | PRRC | NEW MEXICO INSTITUTE OF MINING AND TECHNOLOGY Industry Service group leader

21



## Key Considerations of Application for **Authorization to Inject**

#### The objective of this study is to comply with the New Mexico State Rules:

- TITLE 19 NATURAL RESOURCES AND WILDLIFE
- CHAPTER 15 OIL AND GAS
- PART 26 INJECTION

#### To demonstrate that:

The proposed injection plan for the Copperhead AGI #001

- o will prevent waste,
- o will protect correlative rights, and
- o will not harm public health or the environment.

Specifically:

- The *Silurian and Devonian* formations *can receive* treated acid gas (TAG) at the proposed injection rate.
- The formations will <u>safely contain</u> the injected TAG volume within the proposed injection and post-injection timeframe.
- The proposed injection well will be operated <u>at or below the maximum surface injection pressure</u> approved by the commission.
- The proposed injection well will allow for the sequestration of TAG, which is in the public interest because it prevents flaring and the associated environmental impacts.



## Model Description

#### **Objective:**

- Model plume behavior of injected treated acid gas (TAG) at Copperhead AGI #001 for 60 years (2025-2085) including 30 years injection and 30 years post-injection
- TAG composition is 30%  $H_2S$  and 70%  $CO_2$
- Perform analysis at proposed maximum injection rate (26 MMSCFD)
- Injection zone ~1390 ft thickness
- Overlying confining zones (Woodford Barnett) ~ 775 ft thickness

Layer No.	Formation	Rock Type	
1			
2			
3	Barnett		7
4			
5			Zo
6			Ba
7			
8	Mississippian	Seal	Мо
9			
10			
11			
12			
13	Woodford		
14			
15			
16			
17			
18	Thirtyone		
19			
20			
21			
22			
23	Wristen	Injection zone	
24			
25			
26			
27			
28	Fusselman		
29			
30			
31			
32			
33			
34			
35	Montoya		
36			
37			
38			
39			





### Model Description – Petrophysical Parameters

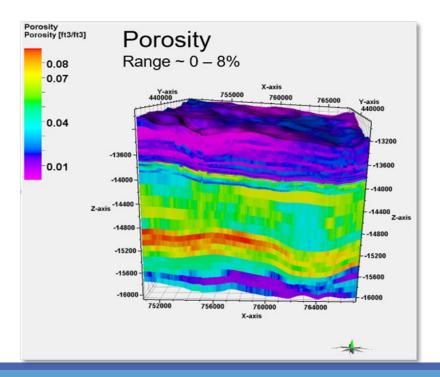
Formation	Measured Depth	Thickness	Porosity (%)	Permeability (md)	Behavior
Rustler	1155	346			
Salado	1501	1288			
Castile	2789	2185			
Lamar	4974	50			
Bell Canyon	5024	1028			
Cherry Canyon	6052	1627			
Brushy Canyon	7679	1265			
Bone Spring	8944	3255			
Wolfcamp	12199	1880			
Strawn	14079	340			Secondary seal
Atoka	14419	1365			Secondary seal
Morrow	15784	745			Secondary seal
Barnett Shale	16529	253	1.00%	0.1	Seal
Mississippian Ls	16782	392	1.50%	0.1	Seal
Woodford Sh	17174	125	1.00%	0.04	Seal
Thirtyone Fm	17299	120	2.20%	1.5	Injection zone
Wristen Gp	17419	770	3.50%	6	Injection zone
Fusselman	18189	500	4.00%	2	Injection zone
Montoya	18689	80	2.00%	1	Seal
Simpson shales	18769	1615	1.00%	0.6	Seal
Ellenburger Dolomite	20384	550	1.50%	0.01	Seal
Ground elevation	3579				

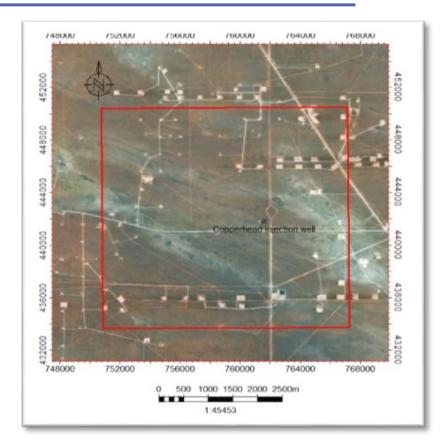
.



#### Model Description

- Model Size: 3.1 mi x 3.2 mi (9.92 mi<sup>2</sup>)
- Number of cells: (X,Y,Z)=164 x 167 x 39
- Total cells: 1,068,132
- Cell size:100 x 100 ft<sup>2</sup>





Map view, red square marks model boundary

## Model Initialization

#### **Formation Pressure:**

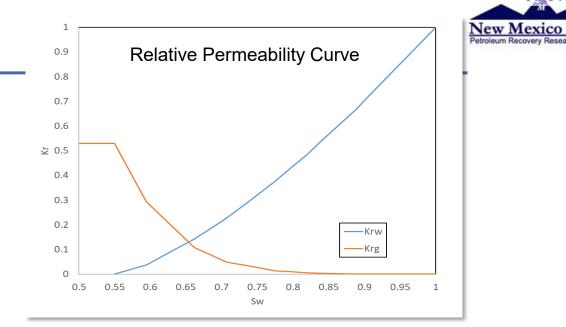
• ~ 7,750 psi (pore pressure gradient: 0.45 psi/ft)

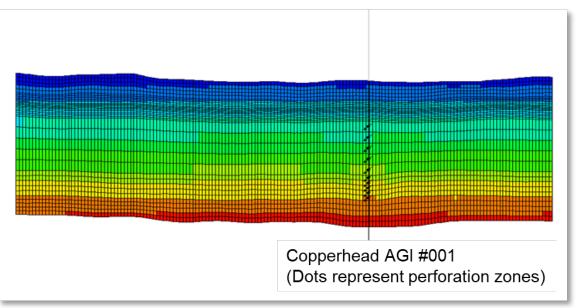
#### **Formation Temperature:**

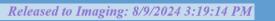
• ~225 °F (Luo, 1994)

#### **Fluid Saturation:**

 Initial Sw = 1.0, Swi = 0.55 (Jenkins, 1961; Bennion and Bachu, 2005)







Page 95 of 162

#### Page 96 of 162 Petroleum Recovery Research Ce

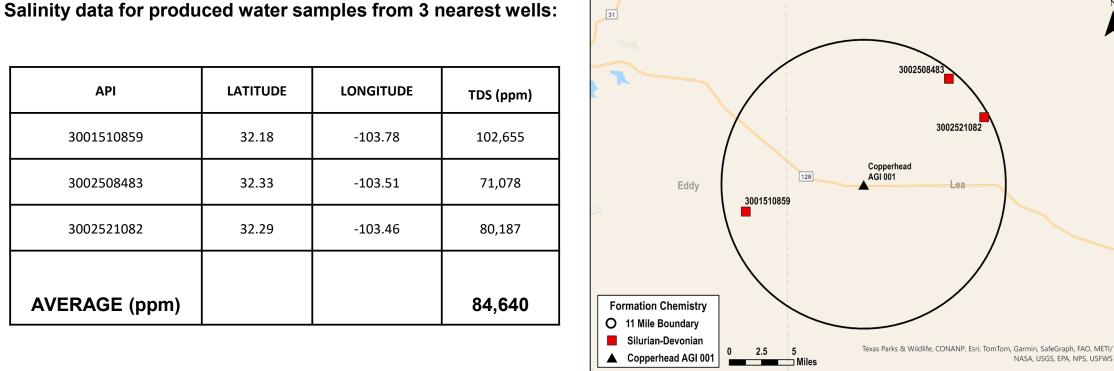
Ν

#### Model Initialization

#### **Total Dissolved Solids:**

• 84,640 ppm (averaged based on 3 wells within 11 miles, data from the corresponding C-108s)

ΑΡΙ	LATITUDE	LONGITUDE	TDS (ppm)	
3001510859	32.18	-103.78	102,655	
3002508483	32.33 -103.51		71,078	
3002521082	32.29	-103.46	80,187	
AVERAGE (ppm)			84,640	





#### Simulated Injection Parameters

#### Well control calculation, Copperhead AGI #001

Lat	Long	Top Thirtyone MD, ft	Ground Elevation, ft	Formation fracture pressure, psi*	90% Formation fracture pressure, psi	MASIP, psi	
32.212608	-103.62119	17,299	3,579	11,244	10,120	3,460	
*Formation fracture gradient of 0.65 psi/ft							

#### Simulated injection scenario

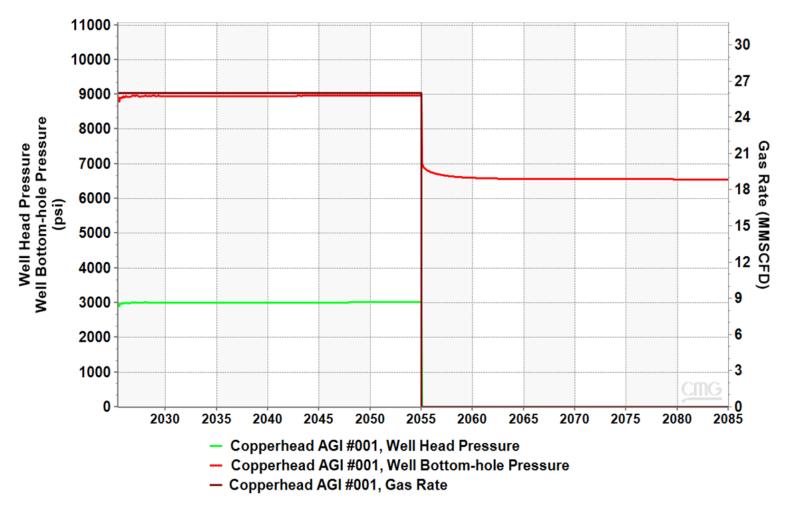
Case	Injection Rate (MMSCFD)
Proposed maximum injection rate	26

- The wellhead pressure limit is set to the maximum allowable surface injection pressure (MASIP).
- The bottom-hole pressure limit is set to 90% of the formation fracture pressure.



## TAG Injection Profile of Copperhead AGI #001

#### **Daily injection rate for:** *Proposed average injection rate (26 MMSCFD)*



- The simulation results indicate that:
  - □ The Copperhead AGI #001 can operate

successfully with a consistent TAG injection

rate of 26 MMSCFD.

- Both wellhead pressure and bottom-hole
   pressure remain within allowable limits during
   the injection period.
- □ The nearby SWD well (McCloy SWD #002 @

2.85 miles) does not interfere with the

Copperhead AGI #001 operations.

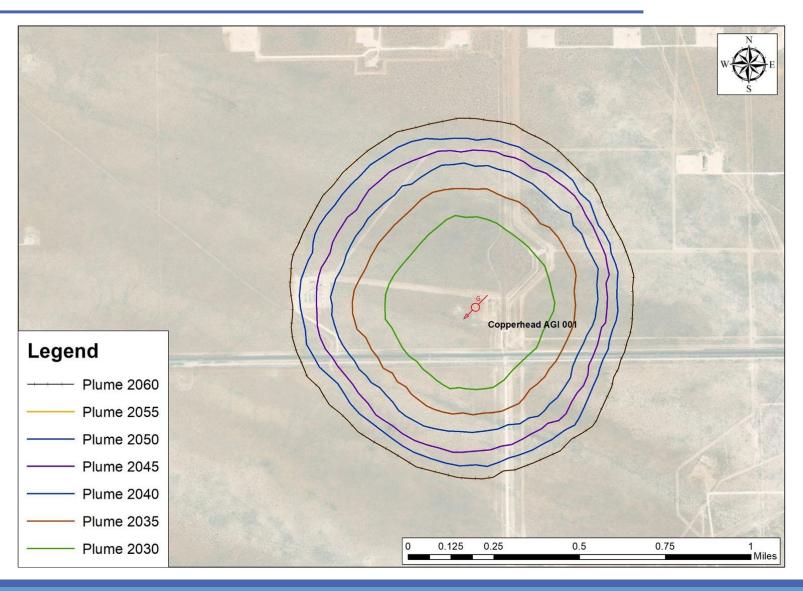
9

## TAG Plume Review



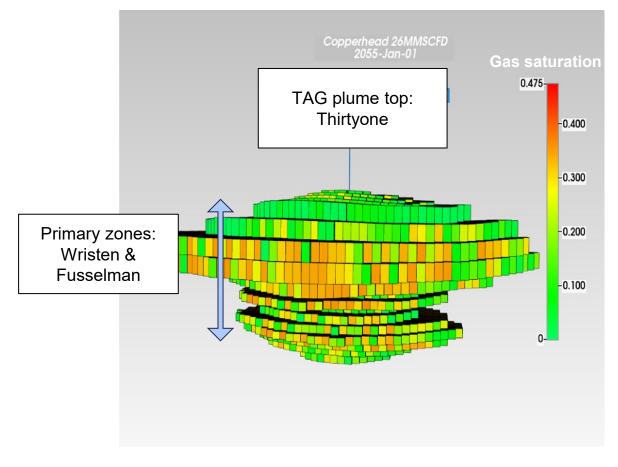
- Expansion of TAG plumes every 5 years from 2030 to 2060
- TAG plume stabilization projected in 2060
- Largest extent of the TAG plume estimated at 5,471 ft (1.04 miles)

with a injection rate of 26 MMSCFD





#### TAG Plume Review



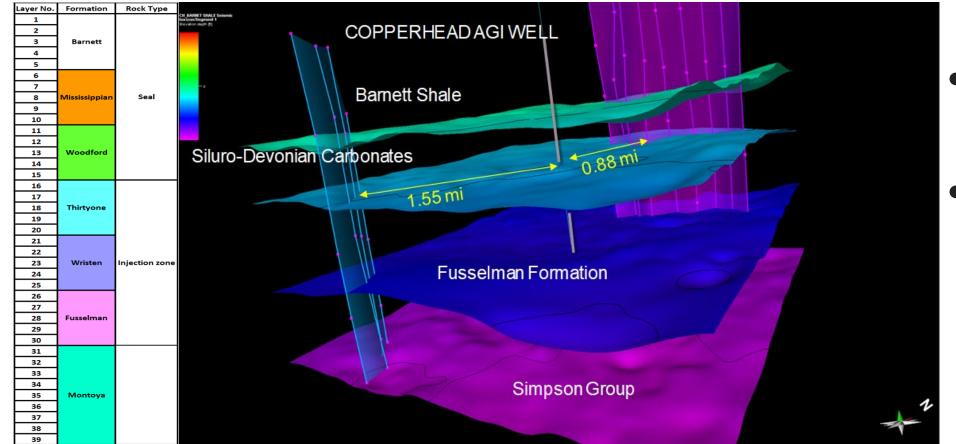
The end of injection (2055)

Copperhead injection well 128 128 128 128 2000ftUS

The end of injection (2055)



### Fault Slip Potential

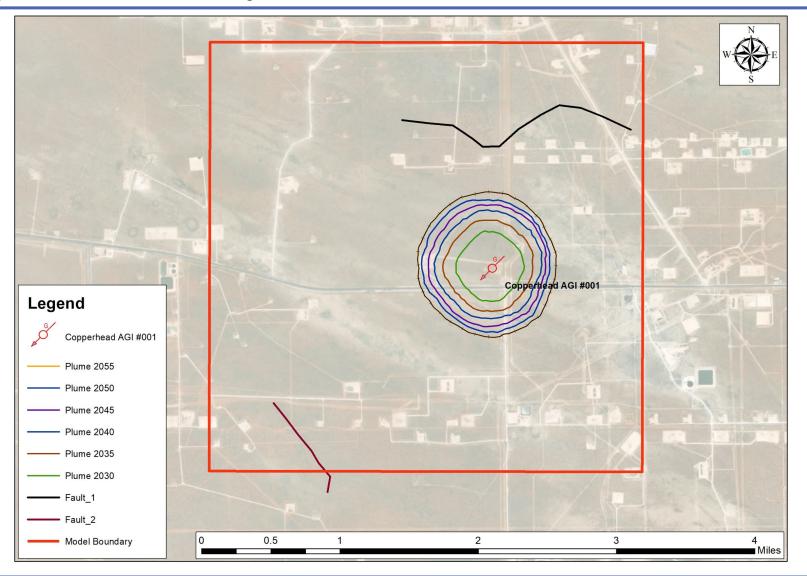


• Two faults identified

Located approximately
 0.8 and 1.55 miles from
 the Copperhead AGI
 #001 injection well



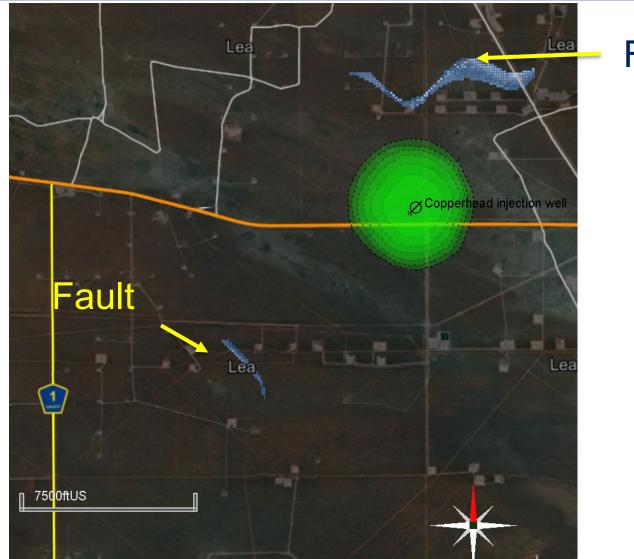
#### CO2 plume after 30 years



.



#### CO2 plume after 30 years



Fault

.



Fault Slip Potential (FSP) version 1.07 is a software tool for probabilistically screening faults near injection wells. The program was created by the Stanford Center for Induced and Triggered Seismicity through industry-academic collaboration.

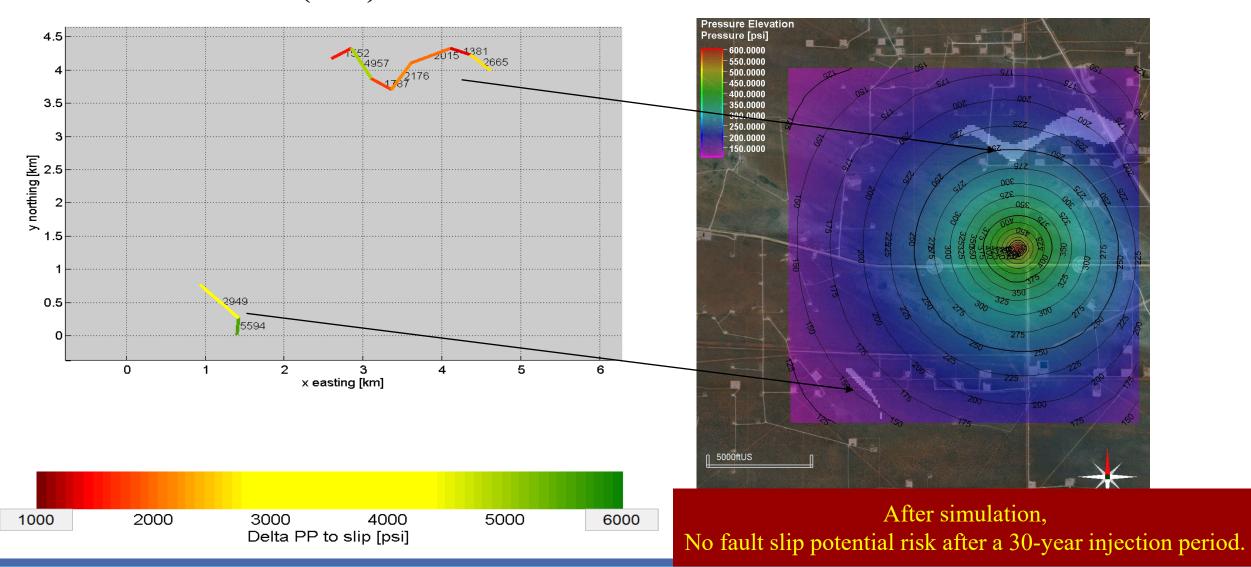
Vertical Stress Gradient (psi/ft)	1.05+/-0.01	Dvory and Zoback (2021); Luo et al. (1994)
Maximum Horizontal Stress Direction (deg)	80 +/- 8	Dvory and Zoback (2021); Snee, MD Zoback, (2018); Luo et al. (1994)
Minimum Horizontal Stress Gradient (psi/ft)	0.65+-0.05	Luo et al. (1994)
A-Phi Parameter	0.6+/-0.1	Snee, MD Zoback, (2018)
Reference Friction Coefficient (mu)	0.58+/005	Snee, MD Zoback, (2018)
Injection Years	2025 to 2055	

#### Input Parameters

## Pressure change needed to activate the fault

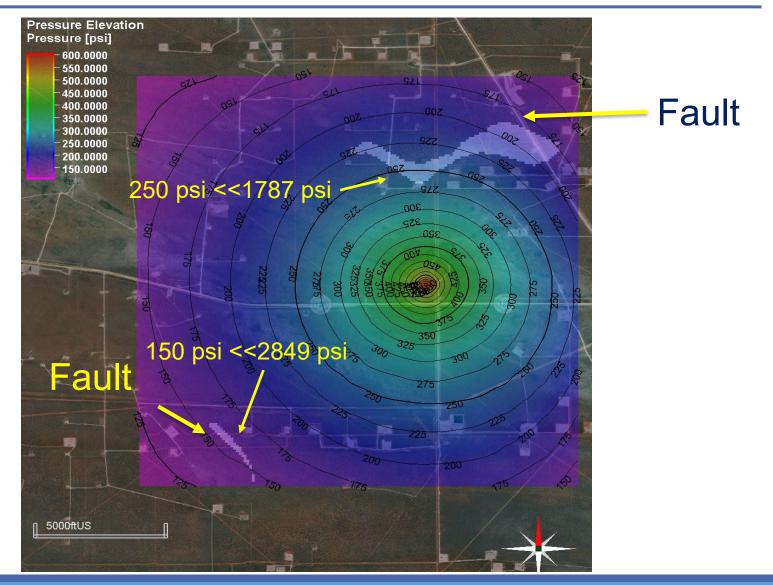


(FSP)





## Pressure change (psi) due to injection after 30 years





# Section IV Wellbore Design and Operational Programs

#### **PAUL RAGSDALE \***ENGINEERING CONSULTANT | OPERATIONS ENGINEERING & OIL AND GAS CONSULTING

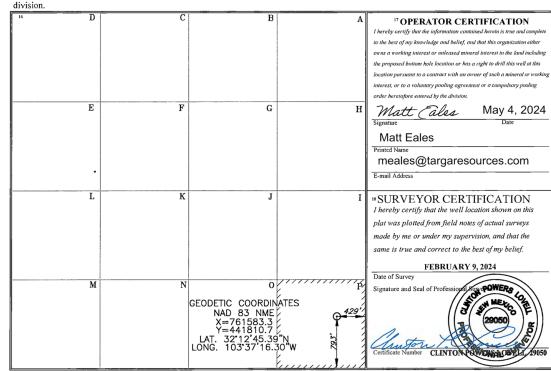
38

#### Well Location and Acreage Dedication



District I Form C-102 State of New Mexico 1625 N. French Dr., Hobbs, NM 88240 Revised August 1, 2011 Phone: (575) 393-6161 Fax: (575) 393-0720 Energy, Minerals & Natural Resources Department District II Submit one copy to appropriate 811 S. First St., Artesia, NM 88210 OIL CONSERVATION DIVISION Phone: (575) 748-1283 Fax: (575) 748-9720 District Office District III 1220 South St. Francis Dr. 1000 Rio Brazos Road, Aztec, NM 87410 AMENDED REPORT Phone: (505) 334-6178 Fax: (505) 334-6170 Santa Fe, NM 87505 District IV 1220 S. St. Francis Dr., Santa Fe, NM 87505 Phone: (505) 476-3460 Fax: (505) 476-3462 WELL LOCATION AND ACREAGE DEDICATION PLAT <sup>2</sup> Pool Code <sup>3</sup> Pool Name <sup>1</sup> API Number AGI: DEVONIAN 97885 <sup>6</sup> Well Number <sup>4</sup> Property Code <sup>5</sup> Property Name **COPPERHEAD AGI** 1 7 OGRID No. <sup>8</sup> Operator Name <sup>9</sup> Elevation 3579' TARGA MIDSTREAM SERVICES LLC 24650 <sup>10</sup> Surface Location UL or lot no. Section Township Range Lot Idn Feet from the North/South line Feet from the East/West line County 429' Р 13 24-S 32-E 793 SOUTH EAST LEA "Bottom Hole Location If Different From Surface UL or lot no. Range Lot Idn Feet from the North/South lin Feet from the East/West line County 15 Order No. 12 Dedicated Acres <sup>13</sup> Joint or Infill <sup>4</sup> Consolidation Code 40.03

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the

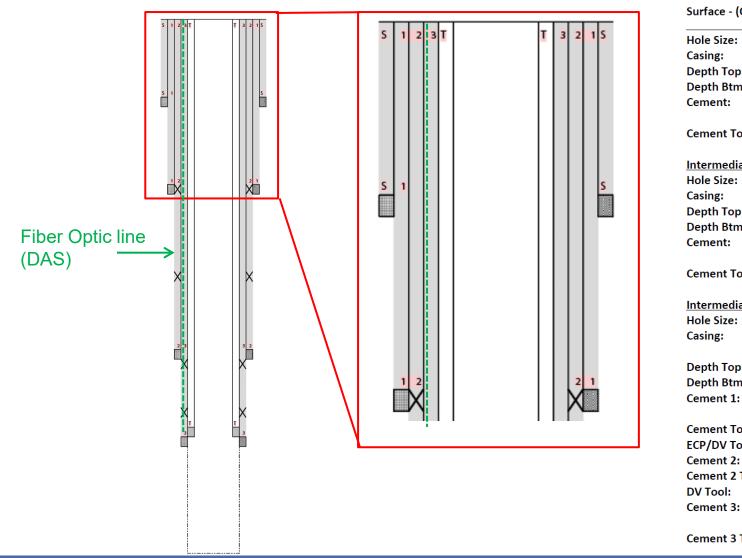


39

#### Received by OCD: 8/8/2024 3:59:15 PM

## Copperhead AGI #001 Wellbore Schematic





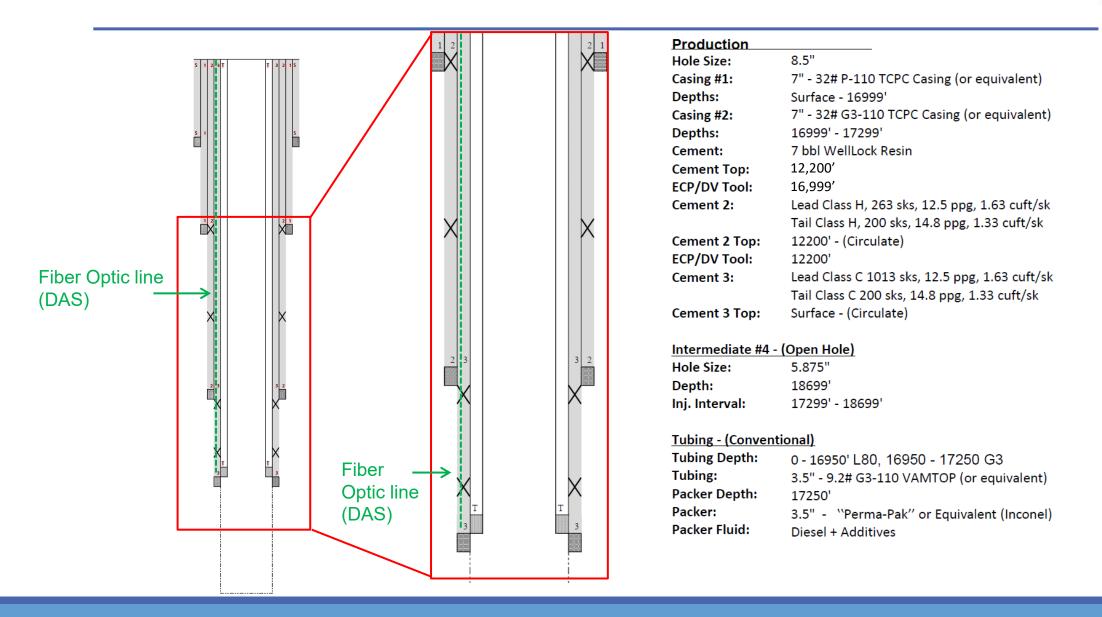
#### Surface - (Conventional)

Hole Size:	26"
Casing:	20" - 106.5# J-55 BTC Casing
Depth Top:	Surface
Depth Btm:	1208'
Cement:	Lead Class C 1680 sks, 12.9 ppg, 1.97
	cuft/sk Tail Class C 200 sks, 14.8 ppg, 1.34
Cement Top:	cuft/sk Surface - (Circulate)
Intermediate #1 - (	(Conventional)
Hole Size:	17.5"
Casing:	13.375" - 72L-80 BTC Casing
Depth Top:	Surface
Depth Btm:	5034'
Cement:	Lead Class C, 1450 sks, 11.8 ppg, 2.45 cuft/sk
	Tail CorrosaCem, 200 sks, 14.5 ppg, 1.30 cuft/sk
Cement Top:	Surface - (Circulate)
Intermediate #2 - (	
Hole Size:	12.25"
Casing:	9.625" - 47# HCL-80 BTC Casing
	Bond Coat 5034'-7100'
Depth Top:	Surface
Depth Btm:	12250'
Cement 1:	Lead Class C, 892 sks, 12.5 ppg, 1.63 cuft/sk
Comont Tons	Tail Class C, 100 sks, 14.8 ppg, 1.33 cuft/sk
Cement Top:	7100' - (Circulate)
ECP/DV Tool: Cement 2:	7100' 262 also Commence 12 0 mm = 1.75 auft/als
	362 sks-CorrosaCem, 12.0 ppg, 1.75 cuft/sk 5070'- (Circulate)
Cement 2 Top: DV Tool:	5070 - (Circulate) 5070'
Cement 3:	Lead Class C, 850 sks, 12.5 ppg, 1.63 cuft/sk
Comont 2 Ton:	Tail Class C, 200 sks, 14.8 ppg, 1.33 cuft/sk
Cement 3 Top:	Surface - (Circulate)

#### *Received by OCD: 8/8/2024 3:59:15 PM*

### Copperhead AGI #001 Wellbore Schematic





## Copperhead AGI #001 Casing and Tubing Design



Casing/ Tubing String	Casing /Tubing	Borehole Diameter,	Casing / Tubing	Coupling/ Connection	Casing/Tubing Material (Weight	String Weight in Air, Ib
	Depth,	in.	Outside		/Grade)	
	TVD1, ft		Diameter,			
			in			
Conductor	0-100	30	28	Welded	118 lb/ft, J-55	11,800
Surface	0-1,208	26	20	BTC	106.5 lb/ft, J-55	128,652
Intermediate #1	0-5,034	17 1/2	13 3/8	BTC	72 lb/ft, L-80	362,448
Intermediate #2	0-12,250	12 1/4	9 5/8	BTC	47 lb/ft, L-80	575,750
				Bond coat		
				5084'-7100'		
Long String	0-17,299	8 5/8	7	Prem FJ	32 lb/ft, Cr1 & -P110	553,568
Open hole	17,299-	5 7/8	N/A	N/A	N/A	N/A
	18,700'					
Tubing	0-17,250'	N/A	3 1/2	VAM	9.2 lb/ft, L-80 & 300'	158,700
					G3 on bottom	



# Copperhead AGI #001 Casing Specification

Casing / Tubing String	Casing / Tubing Material (Weight / Grade / Connection)	Casing/ Tubing Diameters (OD/ID/ Drift), in.	Yield, (ksi)	Tensile (ksi)	Internal (Burst) Yield, psi	Collapse (psi)	Body Yield, (1,000 lbs)	Joint Strength, 1,000 lbs
Surface	106.5 lb/ft, J- 55, BTC	20/19/ 18.812	55	75	2,410	770	1,685	1,595
Inter- mediate #1	72 lb/ft, L-80, BTC	13.375/12.347/12. 191	80	95	5,380	2,670	1,661	1,650
Inter- mediate #2	47 lb/ft, L-80, BTC	9.625/ 8.681/ 8.525	80	95	6,870	4,760	1,086	1,122
Long String	32 lb/ft, Cr13- P110, Prem FJ	7.000/ 6.094/ 5.969	110	125	11,640	10,780	1,025	1,053
Tubing	9.2 lb/ft, VAM TOP/G3	3.500/ 2.992/ 2.867	80	95	10,160	10,540	207	168

# Copperhead AGI #001 Cement Design



Casing	Depth (ft)	Cement Volume (sacks)	Cement Type & Yield	Designed TOC	Centralizers
Conductor	100	82	Type I Neat 14.8 ppg	Surface cement	None
				circulated	
Surface	1,208'	100% open hole excess 1680 sks lead,	Lead Class C + 2% CaCl2 + 0.25Ibl/sk Cello Flake + 0.2% FL,	Surface	1 per joint on bottom 3 joints
			12.9 ppg, 1.97 cuft/sk. Tail 200 sk Class C 14.8 ppg, 1.34	Cement	
		caliper	cuft/sk		
			Circulate	Circulated	
Inter-	5,034'	75% open hole excess	Lead: Class C Cmt + 3% CaCl + 0.25lb/sk CelloFlake + 5lb/sk	Surface	1 per joint for bottom 3 joints, 1 on
mediate #1		Lead: 1400 sks,	LCM, 11.8 ppg 2.453 cuft/sk	Cement	every 3 joints for remaining joints
		Tail: 200 sks CorrasaCem Volume	Tail: CorrosaCem Cmt, 14.5ppg 1.38 cuft/sk		
		verified with fluid caliper		Circulated	
Inter-	12,250'	75% open hole excess	<b>STG 1</b> Lead: Class C Cmt,12.5 ppg, 1.63 cuft/sk Tail:Class C	Surface	1 per joint for bottom 3 joints, 1 on
mediate #2		<b>STAGE 1</b> Lead: 892 sks Tail: 100 sks	Cmt 14.82 ppg, 1.32 cuft/sk STG 2:	Cement	every 3 joints for remaining joints
		STAGE 2 Lead:362 sks CorrosaCem	CorrosaCem, 12.0 ppg, 1.75 cuft/sk STG 3: Lead Class C, 12.5	Circulated	
		STAGE 3 Lead: 850 sks Tail:	ppg, 1.63 cuft/sk Tail: Class C, 14.8 ppg, 1.32 cuft/sk		
		200 sks			
Production	17,299'	75% open hole excess <b>STAGE 1</b> 7 BBLS	STG 1 WELL LOCK RESIN STG 2 Lead Class H cement, 12.5	Surface	1 every 3 joints for remaining joints
		WELLLOCK CMT STAGE 2 Lead 263	ppg, 1.63 cuft/sk Tail: 200 sks cement, 15.6 ppg, 1.		
		sks Tail 200 sks Volume verified with	cuft/sk		
		caliper			
1		* Cement program may	y change based on cement engineer recommendation and cali	per log result.	



## Copperhead AGI #001 Drilling Fluid Design –

Hole Size, in.	Drilling Fluid System	Measured Depth, ft	Mud Weight, ppg	Viscosity	Drill Solids, % volume	рН	Circulation Rate, GPM
20"	fresh water	0 – 1208	8.5 - 9.0	25-30	5	9 – 10	1750
17 ½"	Brine	1208 – 5034	10.0 – 10.5	36-40	10	9 – 10	750-1000
12 1/4"	cut brine	5034 – 12250	8.5 - 9.0	36-40	5 – 8	9 – 10	600-750
8.5"	oil-based mud	12250-17299	8.5 – 12.0	40-45	3 – 5	8 – 10	500-600
5.875"	fresh water	17299- 18699	8.5-9.0	25-30	5	9 – 10	500-600



# Copperhead AGI #001 Logging and Testing

Well Logging	Logging Program	Depth Intervals (ft)
Surface Casing		1 – 1,208
Open Hole	4 Arm Caliper log	
Cased Hole	No Cased Hole logs	
Intermediate Casing		1208 – 5034
Open Hole	Platform Express 150 Array Laterolog, Gamma Ray, 4 arm caliper	
Cased Hole	Cement Bond Log, Gamma Ray	
2 <sup>nd</sup> Intermediate		5034 – 12250
Open Hole	Platform Express 150 Array Laterolog, Gamma Ray, 4 arm caliper	
Cased Hole	Cement Bond Log, Gamma Ray,	
Production Casing		12250-17299
Open Hole	Platform Express 150 Array Laterolog, Gamma Ray, 4 arm caliper, FMI, Sonic	
Cased Hole	Cement Bond Log & VBL Gamma Ray, Sonic Logs	
Open Hole	Gamma Ray, 4 arm caliper, FMI, Sonic	17299-18699

# Copperhead AGI #001Additional Coring and Monitoring



### Proposed Coring Program

• Data to be gathered from the wellbore will include open-hole and cased-hole logs and continuous core samples from the target reservoir intervals and seals as well as fluid samples from the injection zone.

### **Proposed Monitoring Program**

- Fiber Optic Line will be attached behind 7" casing to enable monitoring of temperature and acoustics in and above the formation
- Fiber Optic Lines will be attached to the 3-1/2" tubing and 7" production packer to provide real-time data for bottomhole pressure and temperature of the injection zone and real time data for pressure and temperature of the tubing-casing annulus.
- Fiber Optics provide for Distributive Temperature Sensing (DTS), Distributive Acoustic Sensing (DAS) and Point Pressure/Temperature Monitoring. They provide for Real Time Remote Control, Monitoring and Optimization of Injection wells.

### **Daily Monitoring**

- Routine daily inspection of the wellhead and tubing and annulus pressure and temperatures will occur.
- Visual inspection of the flowline piping and wellhead will also occur daily.



After careful geologic review and engineering study, it shows that:

- The *Siluro-Devonian* formations *can receive* treated acid gas (TAG) at the proposed injection rate.
- The formation will *safely contain* the injected TAG volume within the proposed injection and post-injection timeframe.
- The proposed injection well will be operated <u>at or below the maximum surface injection pressure</u> approved by the commission.
- The proposed injection well will allow for the sequestration of TAG, which is in the public interest because it prevents flaring and the associated environmental impacts.

Therefore, the proposed injection plan for the Copperhead AGI #001 will prevent waste, will protect correlative rights, and will not harm public health or the environment

Targa's C-108 Application for Authorization to Inject should be approved.

#### STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION COMMISSION

#### APPLICATION OF TARGA MIDSTREAM SERVICES, LLC FOR AUTHORIZATION TO INJECT, LEA COUNTY, NEW MEXICO.

CASE NO. 24594

#### SELF-AFFIRMED STATEMENT OF DANA S. HARDY

1. I am attorney in fact and authorized representative of Targa Midstream Services, LLC, the Applicant herein.

2. I am familiar with the Notice Letter attached as **Exhibit C-1** and caused the Notice Letter, along with the Application in this case, to be sent to the parties set out in the chart attached as **Exhibit C-2**.

3. Exhibit C-2 also provides the date each Notice Letter was sent and the date each return was received.

4. Copies of the certified mail green cards and white slips are attached as Exhibit C-3 as supporting documentation for proof of mailing and the information provided on Exhibit C-2.

5. I understand this Self-Affirmed Statement will be used as written testimony in the subject case. I affirm that my testimony above is true and correct and is made under penalty of perjury under the laws of the State of New Mexico. My testimony is made as of the date handwritten next to my signature below.

/s/ Dana S. Hardy Dana S. Hardy <u>August 2, 2024</u> Date

> Targa Midstream Services, LLC Case No. 24594 Exhibit C



#### HINKLE SHANOR LLP

ATTORNEYS AT LAW PO BOX 2068 SANTA FE, NEW MEXICO 87504 505-982-4554 (FAX) 505-982-8623

June 13, 2024

Targa Midstream Services, 114 Af 162 Case No. 24594 Exhibit C-1

> WRITER: Dana S. Hardy, Partner dhardy@hinklelawfirm.com

#### VIA CERTIFIED MAIL RETURN RECEIPT REQUESTED

#### TO ALL PARTIES ENTITLED TO NOTICE RE: TARGA MIDSTREAM SERVICES LLC PROPOSED COPPERHEAD AGI #1

This letter is to advise you that Targa Midstream Services LLC has filed a C-108 application (Application for Authorization to Inject) with the New Mexico Oil Conservation Commission seeking authorization to drill and operate a Class II acid gas injection (AGI) well, the Copperhead AGI #1 well, at Targa Resources' gas processing facility in Lea County, New Mexico. In accordance with the requirements of the New Mexico Oil Conservation Division, you are being provided this notice and hearing application because you are an interested party within one (1) mile of the proposed AGI well location. A complete copy of the C-108 is available at the following link. or vou may contact my office to request а hard copy: https://ocdimage.emnrd.nm.gov/Imaging/FileStore/santafe/cf/20240530/24594 05 30 2024 11 14 51.pdf

The proposed Copperhead AGI #1 will be a vertical well with a surface location of approximately 793 feet from the south line (FSL) and 429 feet from the east line (FEL) (Unit P) in Section 13, Township 24 South, Range 32 East, Lea County, New Mexico. As proposed, the well will inject waste carbon dioxide and hydrogen sulfide into the Devonian formation from approximately 17,299 to 18,689 feet. The maximum surface pressure will not exceed 3,460 psi with a maximum daily injection volume of 26 million standard cubic feet (MMSCF).

This application (Case No. 24594) has been set for a hearing before the New Mexico Oil Conservation Commission at 9:00 am on July 18, 2024. You are not required to attend this hearing, but as an owner of an interest that may be affected by this 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. Hearings are currently conducted in a hybrid fashion, both in-person at the Energy, Minerals, Natural Resources Department, Wendell Chino Building, Pecos Hall, 1220 South St. Francis Drive, 1st Floor, Santa Fe, NM 87505 and via the WebEx virtual meeting platform. To participate virtually, see the instructions posted on the OCC Hearings website: <a href="https://www.emnrd.nm.gov/ocd/occ-info/">https://www.emnrd.nm.gov/ocd/occ-info/</a>.

Pursuant to Division Rule 19.15.4.13.B, a party who intends to present evidence at the hearing shall file a pre-hearing statement and serve copies on other parties, or the attorneys of parties who are represented by counsel, at least four business days in advance of a scheduled hearing, but in no event later than 5:00 p.m. Mountain Time, on the Thursday preceding the scheduled hearing date. The statement must be submitted through the OCD E-Permitting system (https://wwwapps.emnrd.nm.gov/ocd/ocdpermitting/) or via e-mail to

PO BOX 10 ROSWELL, NEW MEXICO 88202 575-622-6510 (FAX) 575-623-9332 PO BOX 1720 ARTESIA, NEW MEXICO 88211 575-622-6510 (FAX) 575-746-6316 PO BOX 2068 SANTA FE, NEW MEXICO 87504 505-982-4554 (FAX) 505-982-8623 7601 JEFFERSON ST NE • SUITE 180 ALBUQUERQUE, NEW MEXICO 87109 505-858-8320 (FAX) 505-858-8321

Released to Imaging: 8/9/2024 3:19:14 PM

<u>occ.hearings@emnrd.nm.gov</u> 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 identification of any procedural matters that are to be resolved prior to the hearing.

If you have any questions concerning this application, you may contact Jimmy Oxford at 940-220-2493.

Sincerely,

<u>/s/ Dana S. Hardy</u> Counsel for Targa Midstream Services LLC

#### STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION COMMISSION

#### APPLICATION OF TARGA MIDSTREAM SERVICES, LLC FOR AUTHORIZATION TO INJECT, LEA COUNTY, NEW MEXICO.

CASE NO. 24594

#### NOTICE LETTER CHART

PARTY	NOTICE LETTER SENT	<b>RETURN RECEIVED</b>
Allar Company	06/13/24	06/24/2024
735 Elm St.		
Graham, TX 76459		
Allar Company	06/13/24	06/24/2024
P.O. Box 1567		
Graham, TX 76459		
COG Operating LLC	06/13/24	06/26/2024
600 W. Illinois Ave.		
Midland, TX 79701		
COG Production, LLC	06/13/24	06/26/2024
One Concho Center		
600 W. Illinois Ave.		
Midland, TX 79701		
Canaan Resources Drilling Co., LLC	06/13/24	06/24/2024
1101 N Broadway, # 300		
Oklahoma City, OK 73103		Returned to Sender
Chevron Midcontinent LP	06/13/24	06/24/2024
6301 Deauville Blvd.		
Midland, TX 79706		
Chevron USA Inc.	06/13/24	06/24/2024
6001 Bollinger Canyon Rd.		
San Ramon, CA 94583		
Cimarex Energy Co.	06/13/24	USPS Tracking last
6001 Deauville Blvd., 300N		checked on 08/02/2024:
Midland, TX 79706		Item delivered
	0.000	06/18/2024
Concho Oil & Gas LLC	06/13/24	06/26/2024
600 W. Illinois Ave.		
Midland, TX 79701	0.001	06/24/2024
ConocoPhillips Company	06/13/24	06/24/2024
315 S Johnstone		
Bartlesville, OK 74005-7500		07/00/0004
ConocoPhillips Company	06/13/24	07/22/2024
P.O. Box 2197		
Houston, TX 77252-2197		

Targa Midstream Services, LLC Case No. 24594 Exhibit C-2

#### STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION COMMISSION

### APPLICATION OF TARGA MIDSTREAM SERVICES, LLC FOR AUTHORIZATION TO INJECT, LEA COUNTY, NEW MEXICO.

CASE NO. 24594

### NOTICE LETTER CHART

Cumberland Properties, Inc.	06/13/24	07/02/2024
3909 W Industrial		
Midland, TX 79703		Returned to Sender
Devon Energy Production Co, LP	06/13/24	06/24/2024
333 W. Sheridan Ave.		
Oklahoma City, OK 73102		
Finaly Resources, LLC	06/13/24	USPS Tracking last
16585 PCH, Suite 324		checked on 08/02/2024:
Sunset Beach, CA 90742		Item picked up at Post
		Office on 06/18/2024
Magnum Hunter Production Inc.	06/13/24	06/24/2024
840 Gessner Rd., Suite 1400		
Houston, TX 77024		
NGL North Ranch LLC	06/13/24	06/24/2024
6120 S Yale Ave., Suite 805		
Tulsa, OK 74136		
NGL Water Solutions Permian, LLC	06/13/24	USPS Tracking last
865 North Albion St., Ste. 400		checked on 08/02/2024:
Denver, CO 80220		Item delivered on
		06/18/2024
NM Department of Transportation	06/13/24	07/11/2024
1120 Cerillos Road		
Santa Fe, NM 87504-1149		
NM Department of Transportation	06/13/24	06/20/2024
P.O. Box 1149		
Santa Fe, NM 87504-1149		
Oxy USA, Inc.	06/13/24	USPS Tracking last
Attn: Land Administration		checked on 08/22/2024:
P.O. Box 27570		Item delivered to P.O.
Houston, TX 77227-7757		Box on 06/17/2024
OVINTIV	06/13/24	06/24/2024
4 Waterway Square Pl, Ste. 100		
The Woodlands, TX 77380-2764		
Pitch Energy Corp	06/13/24	07/08/2024
PO Box 304		
Artesia, NM 88211-0304		Returned to Sender
		Returned to Sender

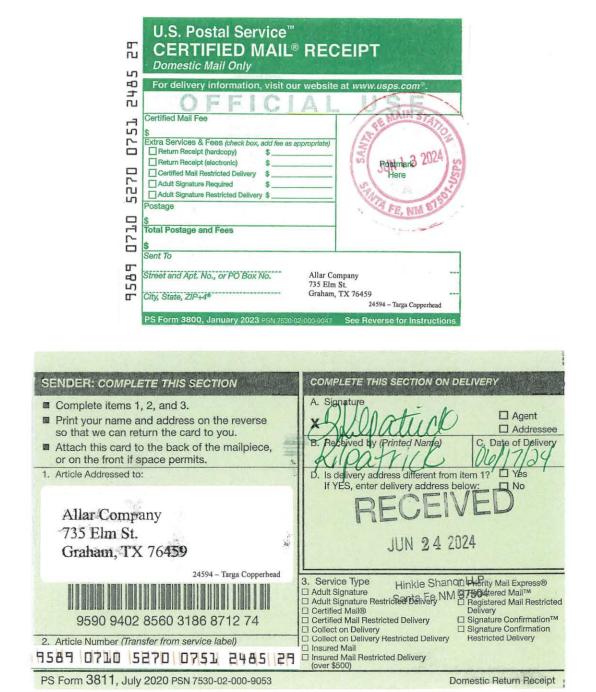
#### STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION COMMISSION

### APPLICATION OF TARGA MIDSTREAM SERVICES, LLC FOR AUTHORIZATION TO INJECT, LEA COUNTY, NEW MEXICO.

CASE NO. 24594

### NOTICE LETTER CHART

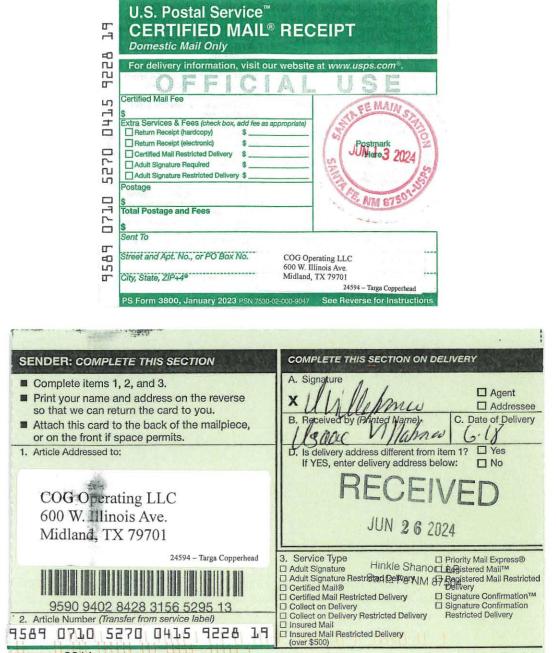
Rover Operating LLC	06/13/24	07/09/2024
17304 Preston Rd., Ste. 740		
Dallas, TX 75252-4645		Returned to Sender
Royalty Holding Co.	06/13/24	06/24/2024
3535 NW 58th St., #720		
Oklahoma City, OK 73112		
SMC Oil & Gas, Inc.	06/13/24	07/02/2024
6800 Gateway East, Ste. 1B		
El Paso, TX 79915		Returned to Sender
Shepherd Royalty	06/13/24	06/24/2024
5949 Sherry Lane, Ste. 1175		
Dallas, TX 75225		
State of New Mexico	06/13/24	06/24/2024
State Land Office		
310 Old Santa Fe Trail		
Santa Fe, NM 87501		
State of New Mexico	06/13/24	06/24/2024
State Land Office		
P.O. Box 1148		
Santa Fe, NM 87504		
US Bureau of Land Management	06/13/24	06/20/2024
NM State Land Office		
301 Dinosaur Trail		
Santa Fe, NM 87508		
Versado Gas Processors, LLC	06/13/24	06/24/2024
KE Andrews & CO		
2424 Ridge Rd		
Rockwall, TX 75087		
XTO Holdings, LLC	06/13/24	06/24/2024
22777 Springwoods Village Pkwy		
Spring, TX 77389		



Targa Midstream Services, LLC Case No. 24594 Exhibit C-3



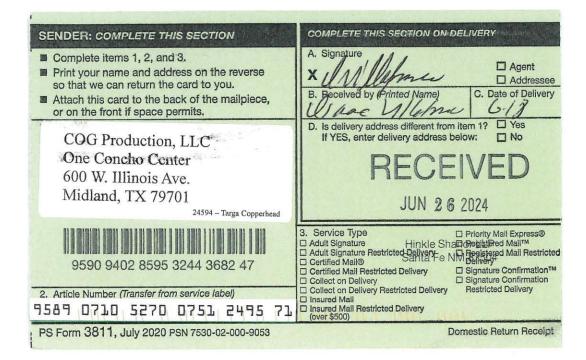




PS Form 3811, July 2020 PSN 7530-02-000-9053

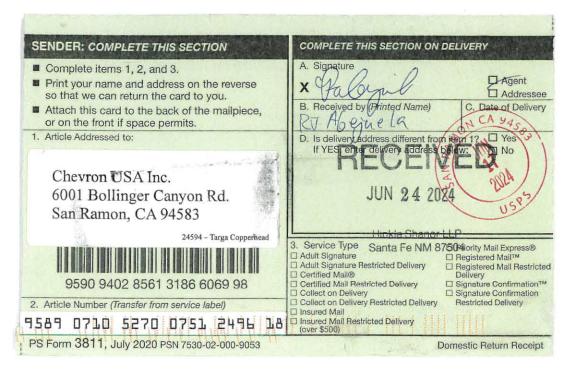
Domestic Return Receipt

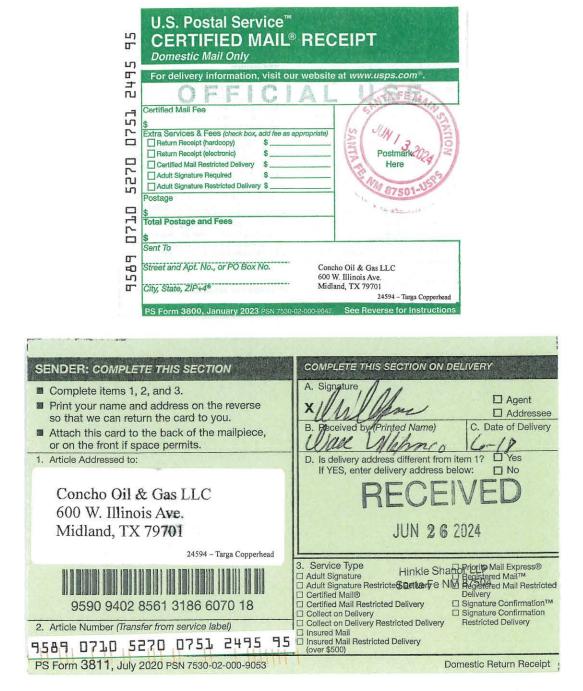






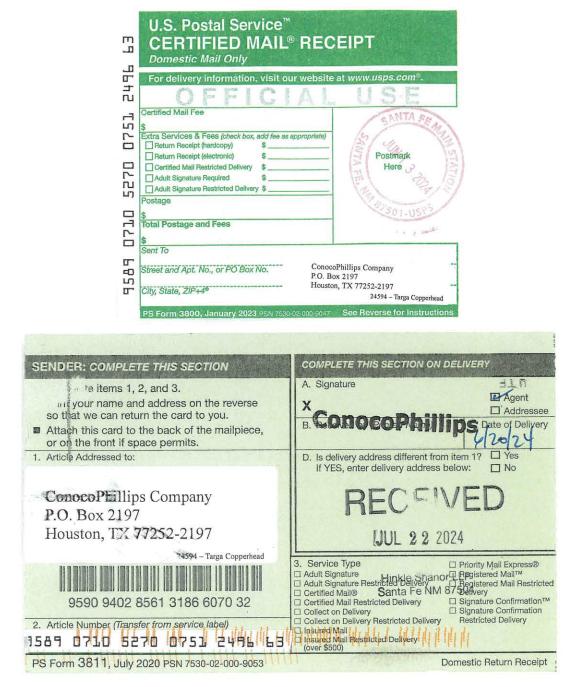


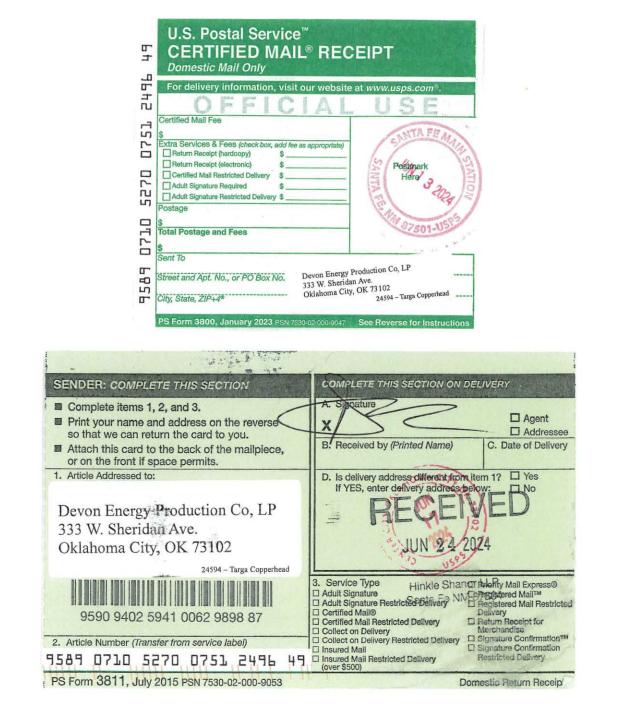


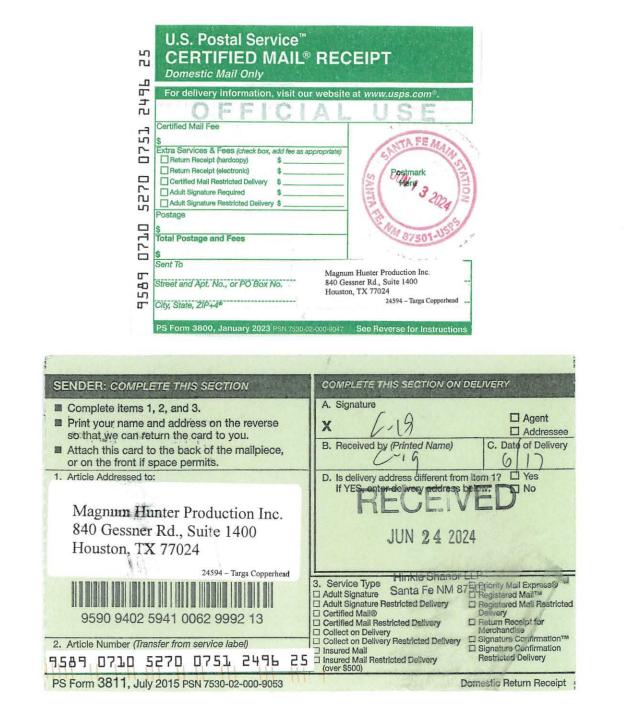


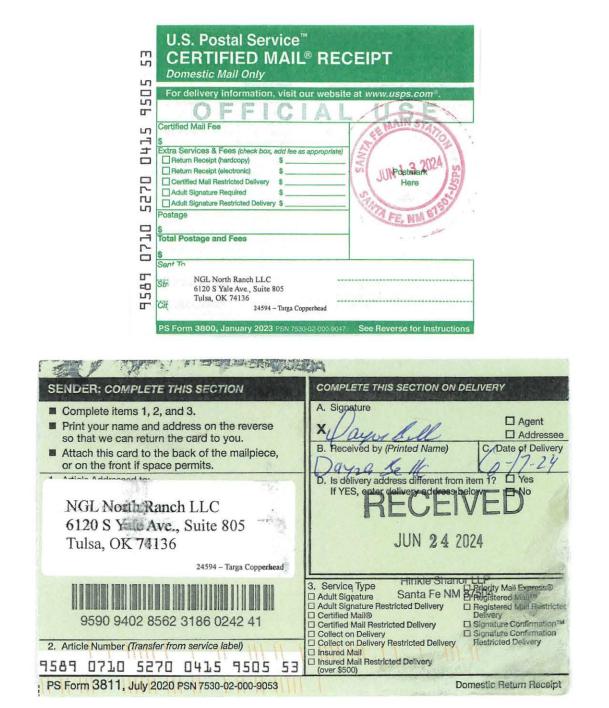








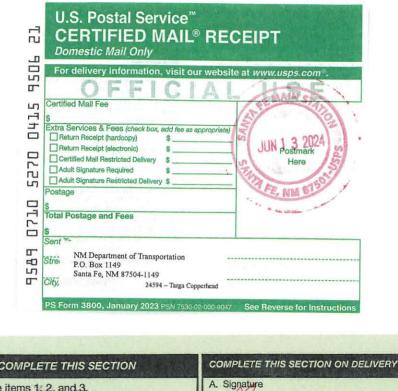




1



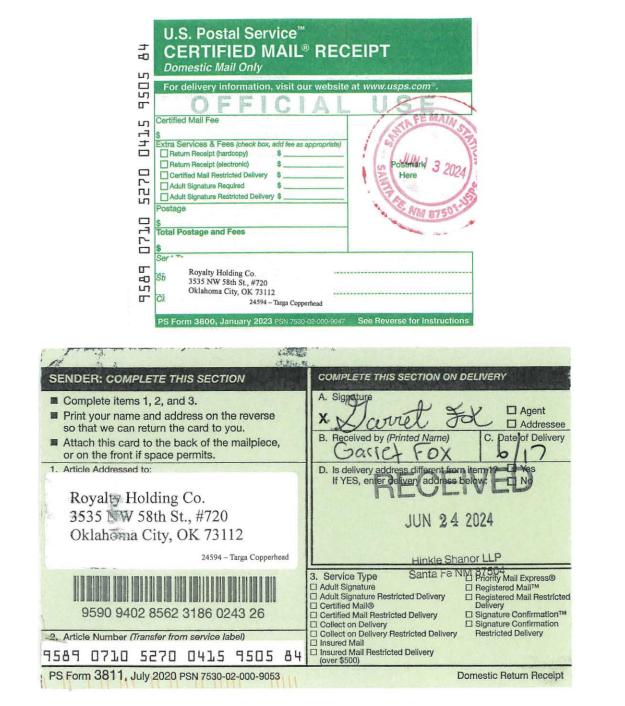
SENDER: COMPLETE THIS SECTION	COMPLETE THIS SECTION ON DELIVERY
<ul> <li>Complete items 1, 2, and 3.</li> <li>Print your name and address on the reverse so that we can return the card to you.</li> <li>Attach this card to the back of the mailpiece, or on the front if space permits.</li> </ul>	A. Signature  X. March State T  Agent Addressee B. Received by (Printed Name) C. Date of Delivery
1. Article Addressed to:	D. Is derivery address diffedent formite of Arry Yes If res, enter delivery address below:
NM Department of Transportation 1120 Cerillos Road Santa Fe, NM 87504-1149	JUL 01 2024 Hinkle Shanor LLP
24594 – Targa Copperhead	3. Service Type
9590 9402 8562 3186 0242 72	□ Adult Signature       □ Registered Mail™         □ Adult Signature Restricted Delivery       □ Registered Mail Restricted Delivery         □ Certified Mail Restricted Delivery       □ Signature Confirmation™         □ Collect on Delivery       □ Signature Confirmation™
2. Article Number (Transfer from service label)	Collect on Delivery Restricted Delivery Restricted Delivery     Insured Mail
9589 0710 5270 0415 9505 22	Insured Mail Restricted Delivery (over \$500)
PS Form 3811, July 2020 PSN 7530-02-000-9053	Domestic Return Receipt

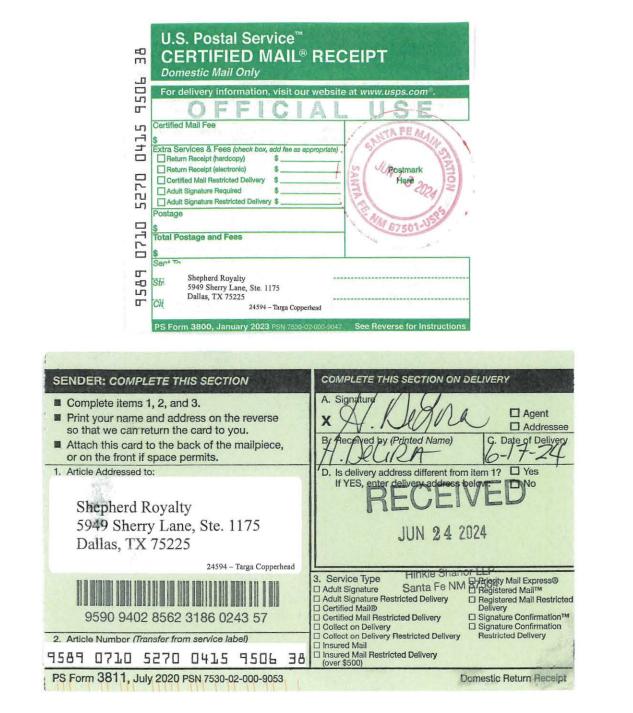


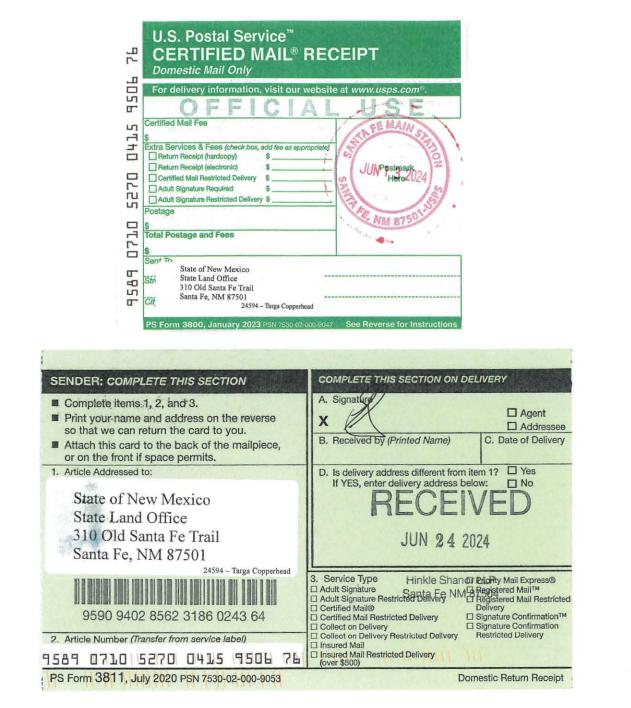






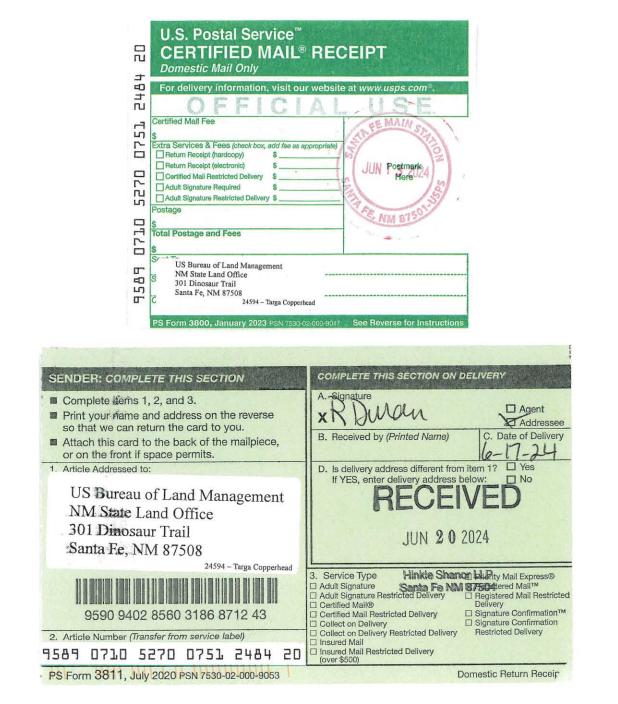




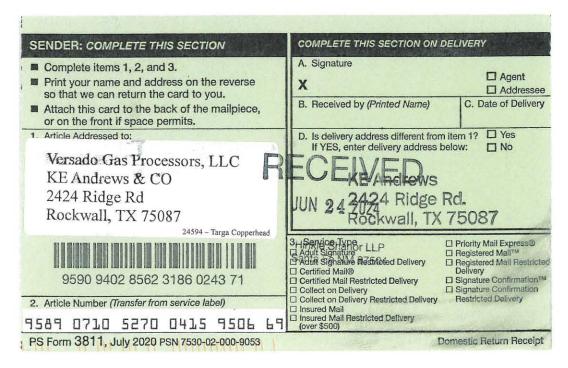


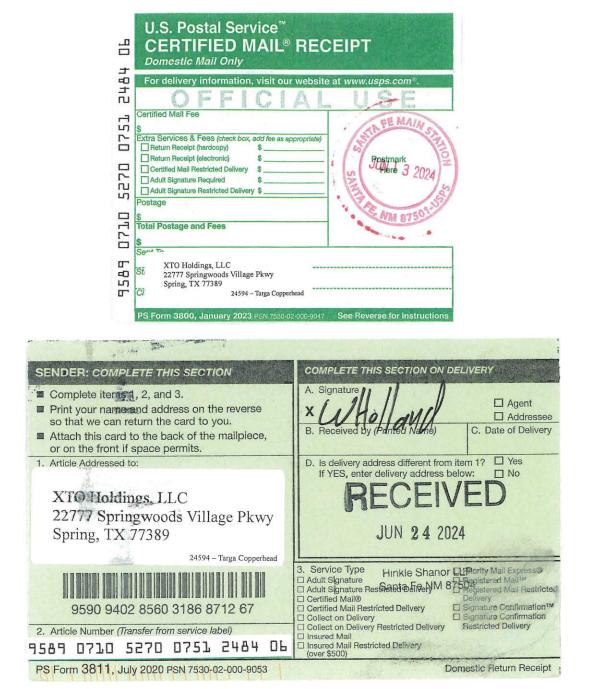


















### CERTIFIED MAIL®



NMR



HINKLE SHANOR LLP

POST OFFICE BOX 2068 SANTA FE, NEW MEXICO 87504



#### CERTIFIED MAIL®

HINKLE SHANOR LLP

POST OFFICE BOX 2068 SANTA FE, NEW MEXICO 87504





RECEIVED

JUL 0 8 2024

Hinkle Shanor LLP Santa Fe NM 87504 Pitch Energy Corp PO Box 304 Artesia, NM 88211-0304

6164

24594 - Targa Copperhead

NIXIE 750 FE 1 0006/22/24
RETURN TO SENDER ATTEMPTED - NOT KNOWN UNABLE TO FORWARD
8C: 87504206868 *0668-64441-23-42

Released to Imaging: 8/9/2024 3:19:14 PM



Released to Imaging: 8/9/2024 3:19:14 PM

1F 2	U.S. Postal Service <sup>™</sup> CERTIFIED MAIL <sup>®</sup> RECEIPT Domestic Mail Only
950	For delivery information, visit our website at www.usps.com®.
0710 5270 0415	Certified Mail Fee
9589	Se · · · · · · · · · · · · · · · · · · ·

#### CERTIFIED MAIL



POST OFFICE BOX 2068 SANTA FE, NEW MEXICO 87504





SMC Oil & Gas, Inc. 6800 Gateway East, Ste. 1B El Paso, TX 79915

\*\*\*\*

24594 - Targa Copperhead

Hinkle Shanor LLP Santa Fe NM 87504

NIXIE 799 FE 1 0006/19/24 SENDER NOT KNOWN RETURN TO ATTEMPTED - NOT KNO SC: 87594206868 ANK \*0668-03968-13-42 998;2 

#### Received by OCD: 8/8/2024 3:59:15 PM



# **USPS Tracking**<sup>®</sup>

FAQs >

Remove X

# Feedback

Tracking Number: 9589071052700751249601

Copy Add to Informed Delivery (https://informeddelivery.usps.com/)

#### **Latest Update**

Your item was delivered to an individual at the address at 1:43 pm on June 18, 2024 in MIDLAND, TX 79706.

#### Get More Out of USPS Tracking:

USPS Tracking Plus®

Delivered Delivered, Left with Individual MIDLAND, TX 79706 June 18, 2024, 1:43 pm

See All Tracking History

Track Another Package

What Do USPS Tracking Statuses Mean? (https://faq.usps.com/s/article/Where-is-my-package)

~
$\checkmark$

Enter tracking or barcode numbers

## **Need More Help?**

Contact USPS Tracking support for further assistance.

FAQs

.



# **USPS Tracking**<sup>®</sup>

FAQs >

Remove X

# Feedback

#### Tracking Number: 9589071052700751249632

Copy Add to Informed Delivery (https://informeddelivery.usps.com/)

#### **Latest Update**

Your item was picked up at a postal facility at 1:29 pm on June 18, 2024 in SUNSET BEACH, CA 90742.

#### Get More Out of USPS Tracking:

USPS Tracking Plus<sup>®</sup>

Delivered Delivered, Individual Picked Up at Postal Facility SUNSET BEACH, CA 90742 June 18, 2024, 1:29 pm

See All Tracking History

What Do USPS Tracking Statuses Mean? (https://faq.usps.com/s/article/Where-is-my-package)

Text & Email Updates	$\checkmark$
USPS Tracking Plus®	$\checkmark$
Product Information	$\checkmark$
See Less 🔨	
Track Another Package	

Enter tracking or barcode numbers

### **Need More Help?**

Contact USPS Tracking support for further assistance.



#### *Received by OCD: 8/8/2024 3:59:15 PM*

ר "	Domestic Mail Only	IPT		
	For delivery information, visit our website at	t www.usps.com®.		
	OFFICIAL	USE		
3	Certified Mail Fee	AR MAIN STAN		
	Extra Services & Fees (check box, add fee as appropriate)	ST NO		
	Return Receipt (hardcopy)     S     Return Receipt (electronic)     S	Postmark - 0004		
	Certified Mail Restricted Delivery \$	Hand 3 2024		
	Adult Signature Required \$	JON		
	Adult Signature Restricted Delivery \$	121		
F	Postage	12 000		
3	B	FE, NIM SI		
1	Total Postage and Fees	all all		
Total Postage and Fees				
S	Sent To			
-	Sire NGL Water Solutions Permian, LLC			
5	805 North Albion St., Ste. 400			
	Denver, CO 80220 24594 - Targa Copperhead			

# **USPS Tracking**<sup>®</sup>

FAQs >

Remove X

# Feedback

#### Tracking Number: 9589071052700415950539

Copy Add to Informed Delivery (https://informeddelivery.usps.com/)

#### **Latest Update**

Your item was delivered to an individual at the address at 10:32 am on June 18, 2024 in DENVER, CO 80220.

#### Get More Out of USPS Tracking:

USPS Tracking Plus®

Delivered Delivered, Left with Individual DENVER, CO 80220 June 18, 2024, 10:32 am

See All Tracking History

What Do USPS Tracking Statuses Mean? (https://faq.usps.com/s/article/Where-is-my-package)

Text & Email Updates	$\sim$
USPS Tracking Plus®	$\checkmark$
Product Information	$\checkmark$
See Less 🔨	
Track Another Package	

Enter tracking or barcode numbers

## **Need More Help?**

Contact USPS Tracking support for further assistance.

FAQs

.

Received by OCD: 8/8/2024 3:59:15 PM



# **USPS Tracking**<sup>®</sup>

FAQs >

Remove X

# Feedback

#### Tracking Number: 9589071052700415950614

Copy Add to Informed Delivery (https://informeddelivery.usps.com/)

#### **Latest Update**

Your item has been delivered and is available at a PO Box at 11:01 am on June 17, 2024 in HOUSTON, TX 77027.

#### Get More Out of USPS Tracking:

USPS Tracking Plus®

#### Delivered Delivered, PO Box HOUSTON, TX 77027 June 17, 2024, 11:01 am

See All Tracking History

What Do USPS Tracking Statuses Mean? (https://faq.usps.com/s/article/Where-is-my-package)

Text & Email Updates	$\checkmark$
USPS Tracking Plus®	$\checkmark$
Product Information	$\checkmark$
See Less 🔨	
Track Another Package	

Enter tracking or barcode numbers

## **Need More Help?**

Contact USPS Tracking support for further assistance.

FAQs

.