

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

**APPLICATION OF AGAVE ENERGY COMPANY
FOR AUTHORIZATION TO INJECT,
LEA COUNTY, NEW MEXICO**

CASE NO. 14720

**TARGA NORTHERN DELAWARE, LLC'S
NOTICE OF SUBMISSION OF INJECTION DATA AND UPDATED PLUME MODEL**

In accordance with Ordering Paragraph 2(c) of Order No. R-13507-D, Targa Northern Delaware, LLC,¹ is submitting to the Commission: (1) injection data for the first four years of operation of the Red Hills AGI #1 Well; and (2) an updated model of the projected scope of the injection plume after 30 years of injection.

Respectfully submitted,

HINKLE SHANOR LLP

/s/ Dana S. Hardy

Dana S. Hardy

Jaclyn M. McLean

Yarithza Peña

P.O. Box 2068

Santa Fe, NM 87504-2068

Phone: (505) 982-4554

dhardy@hinklelawfirm.com

jmclean@hinklelawfirm.com

ypena@hinklelawfirm.com

Counsel for Targa Northern Delaware, LLC

¹ Targa Northern Delaware, LLC, is the successor in interest to Lucid Energy and is the current operator of the Red Hills AGI #1.

Certificate of Service

I hereby certify that a true and correct copy of the foregoing notice was served on the following counsel by electronic mail on this 30th day of November, 2022:

Jesse Tremaine – jessek.tremaine@emnrd.nm.gov

Kaitlyn Luck – kaitlyn.luck@emnrd.nm.gov

Counsel for the New Mexico Oil Conservation Division

/s/ Dana S. Hardy



TARGA



RED HILLS AGI #001: 5-YEAR TAG INJECTION REVALIDATION STUDY

RED HILLS AGI #001

API NO. 30-025-40448

SEC. 13- TWP. 24S-33E

LEA COUNTY, NEW MEXICO

Prepared For:

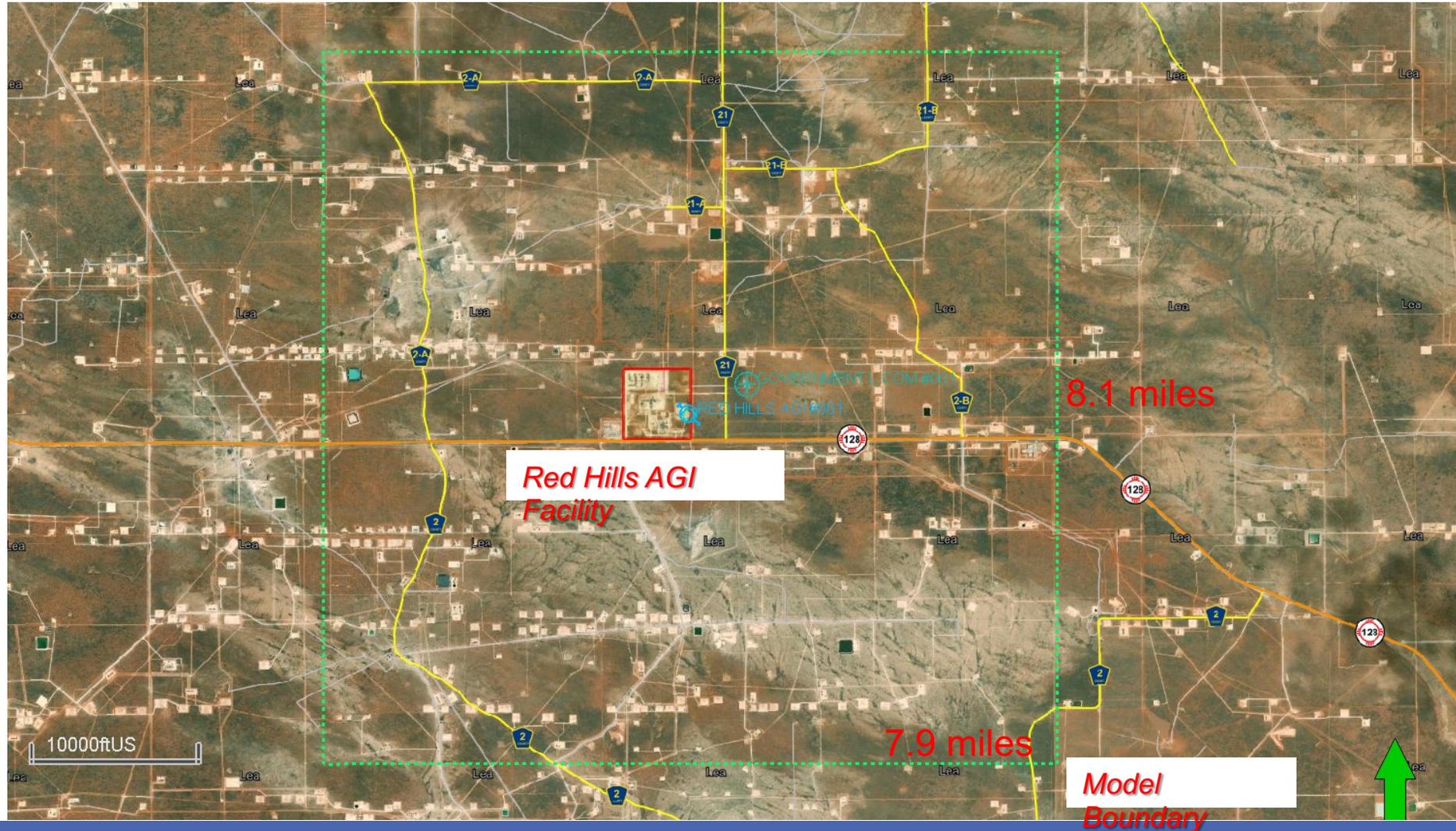
Targa Northern Delaware, LLC

Prepared By:

New Mexico Institute Of Mining And Technology
Petroleum Recovery Research Center
Socorro, NM 87801

November 2022

Model Description



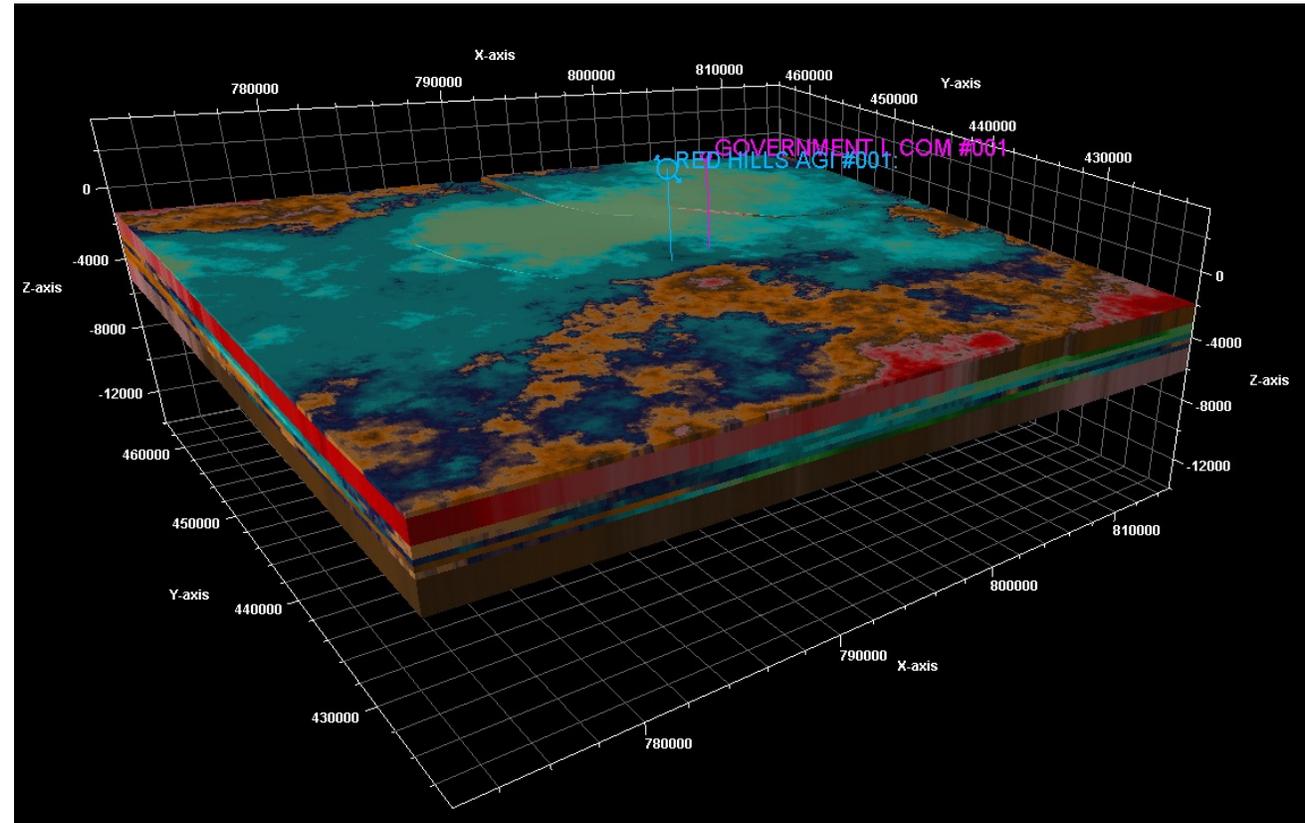
Model Description

Dimension:

- 429 x 418 x 8
- 1,434,576 total grids
- 100 sq.ft average grid size

Zones modeled:

Layer No.	Formation	Rock Type
1	LAMAR	Caprock
2	BELL CANYON	
3	CHERRY CANYON	Storage Reservoir
4		
5		
6		
7	BRUSHY CANYON	Bedrock
8		



Model Initialization

Pressure

- 7500 psi Sample taken at 17500 ft TVD
 - Cherry Canyon ~ 1725.86 psi @ Metropolis location

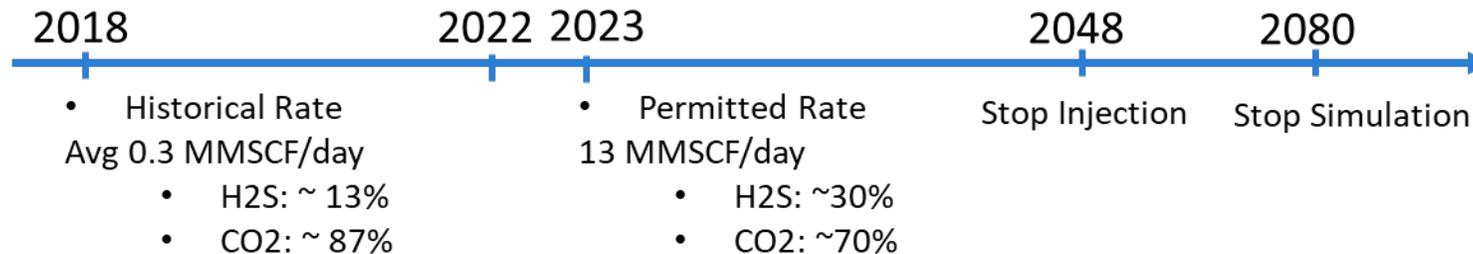
Temperature

- 225F Sample taken at 17500 ft TVD
 - Cherry Canyon ~105.2 F @ Metropolis location

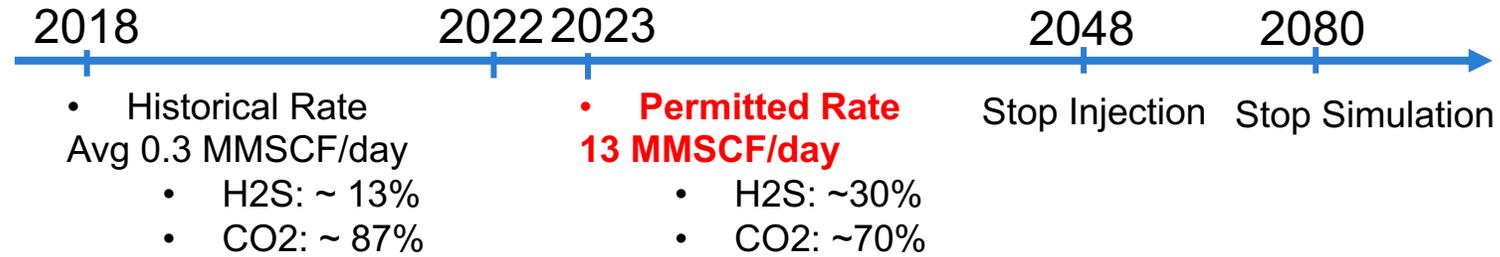
Salinity

- 20,000 ppm for all intervals is assumed

Well Control



Well control



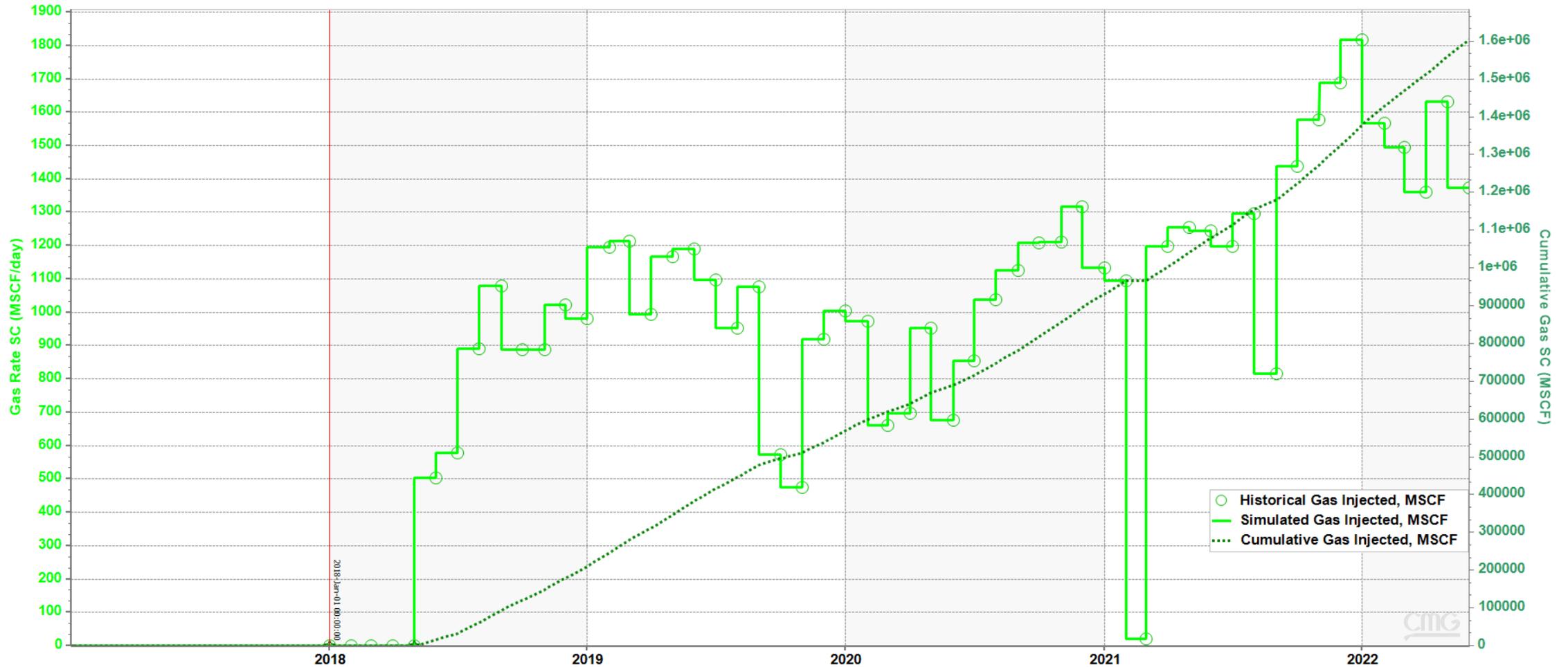
Layer No.	Formation	
1	Chester	90% PF@ 0.68 psi/ft
2		5691.6
3		
4	Meramec-Osage	5814
5		
6		
7	Woodford	6028.2
8	Devonian	6120
9		
10		
11		
12		

Wellbore model

Type of pressure loss calculations:	MODEL (flow correlation) ▼	
Tubing data:		
depth	10447 ft	Calculate
length	10447 ft	
relative roughness	0.0001	
well head temperature	60 F	
bottom hole temperature	154 F	
radius	0.12 ft	

Historical Injection – Gas Rate

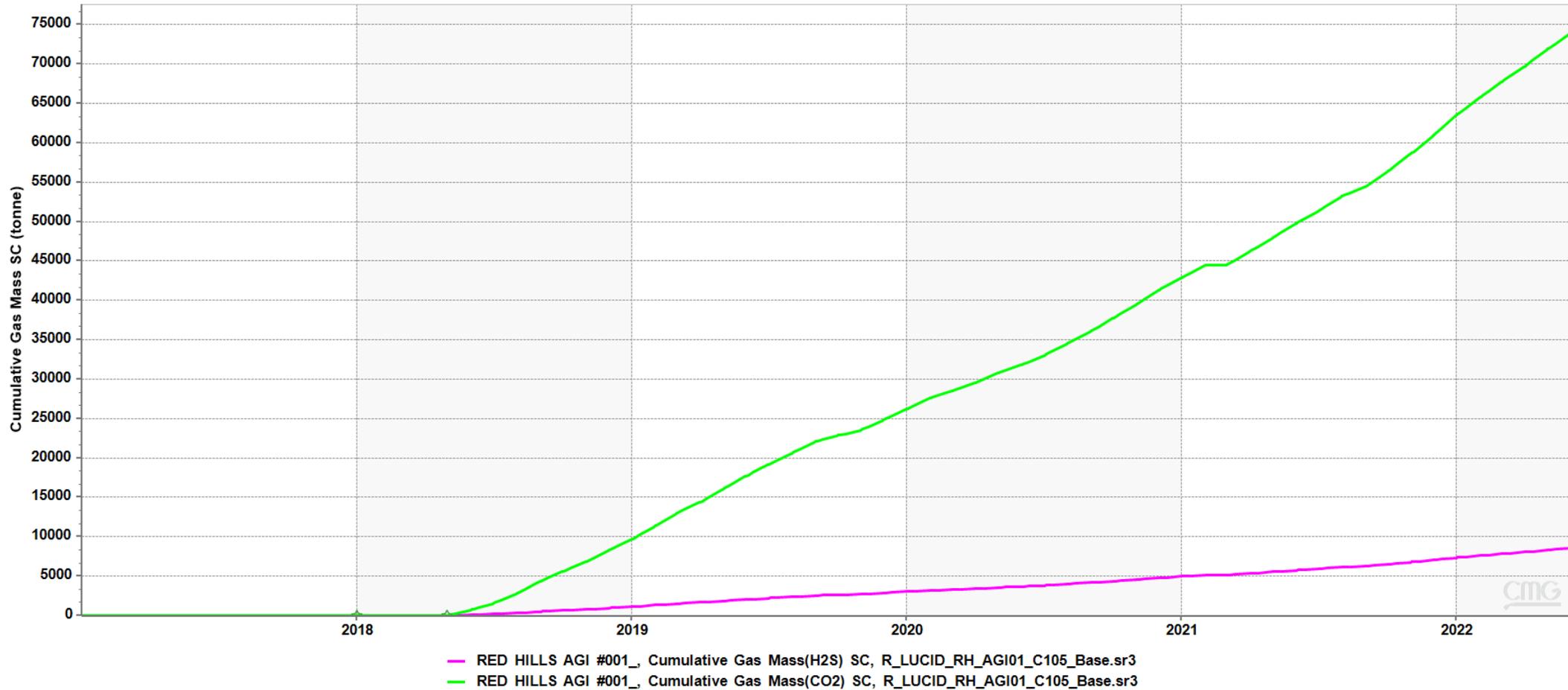
Gas Rate SC - RED HILLS AGI #001_



* The permitted rate of AGI#1 is 13 MMSCF/day

Historical Injection – Injected of CO₂ and H₂S

Cumulative Gas Mass SC - GOVERNMENT L COM #001,RED HILLS AGI #001_



*CO₂ Injected:
73,855 tonnes*

*H₂S Injected:
8,545 tonnes*

Revalidation Results – Gas Plume

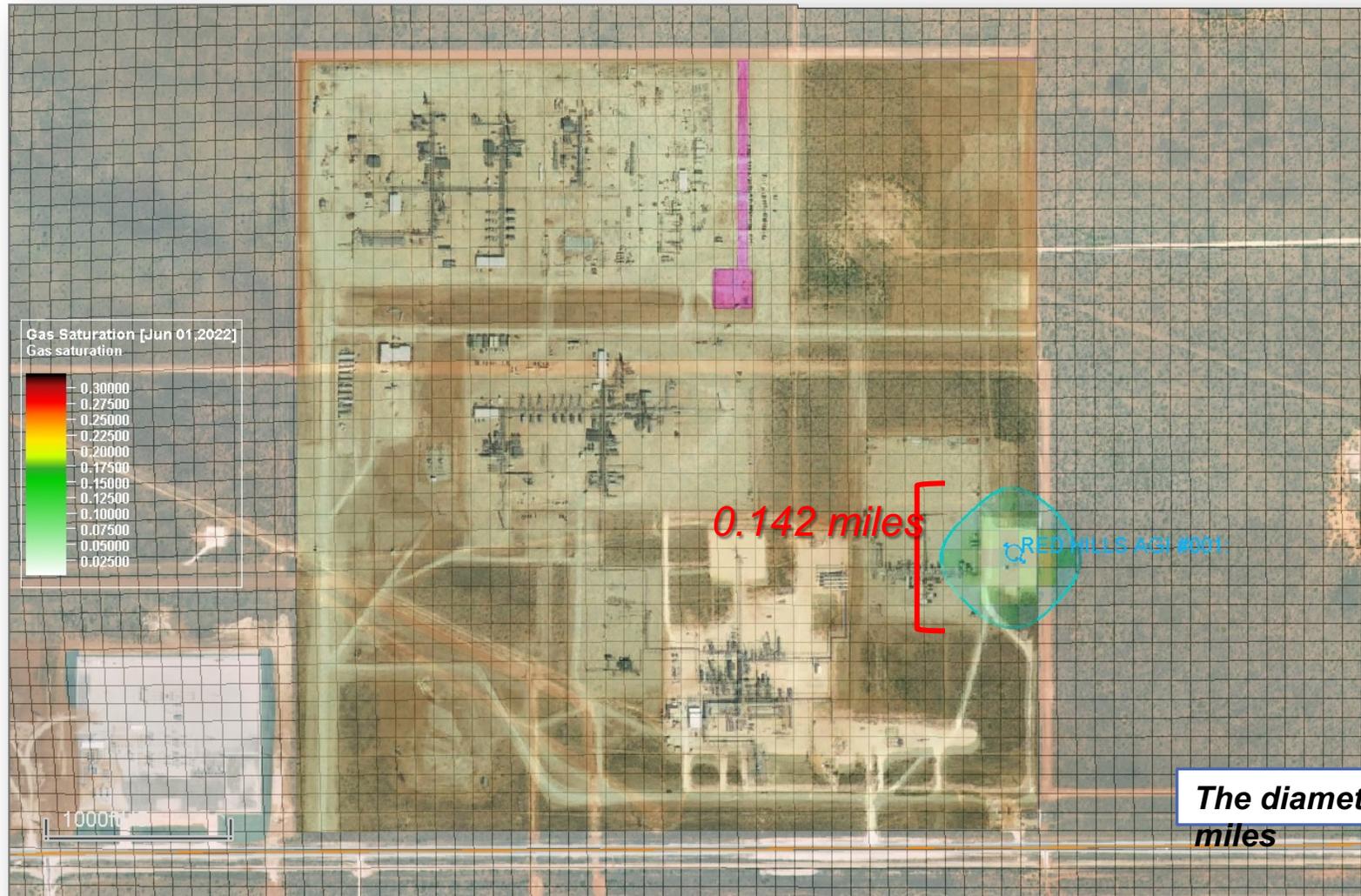


**As of
2022/06**

The distance between the
RH_AGI_#001 and **Gov._L
COM_#001** is 0.735 miles

Revalidation Results – Gas Plume

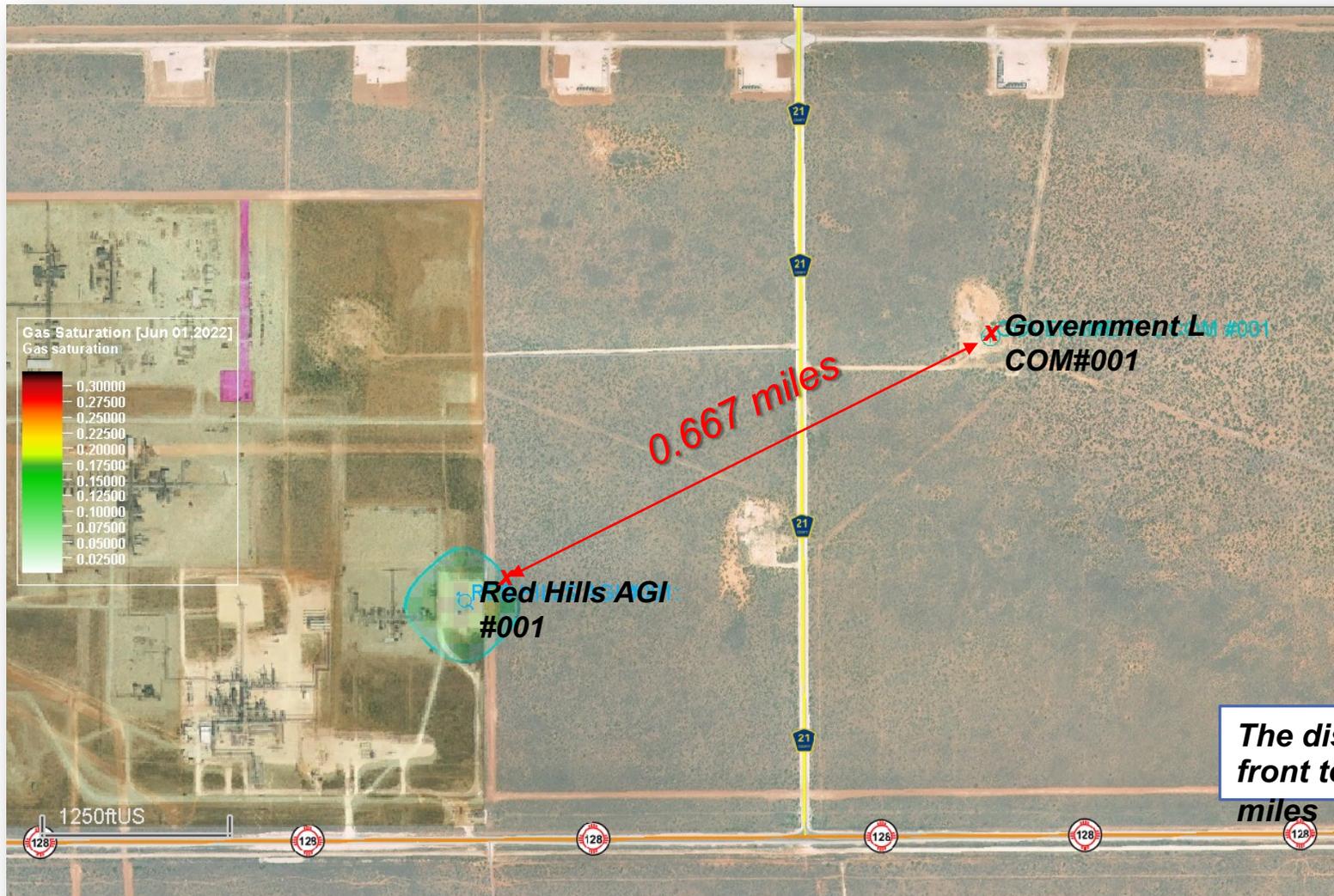
**As of
2022/06**



The diameter of the TAG plume is 0.735 miles

Revalidation Results – Gas Plume

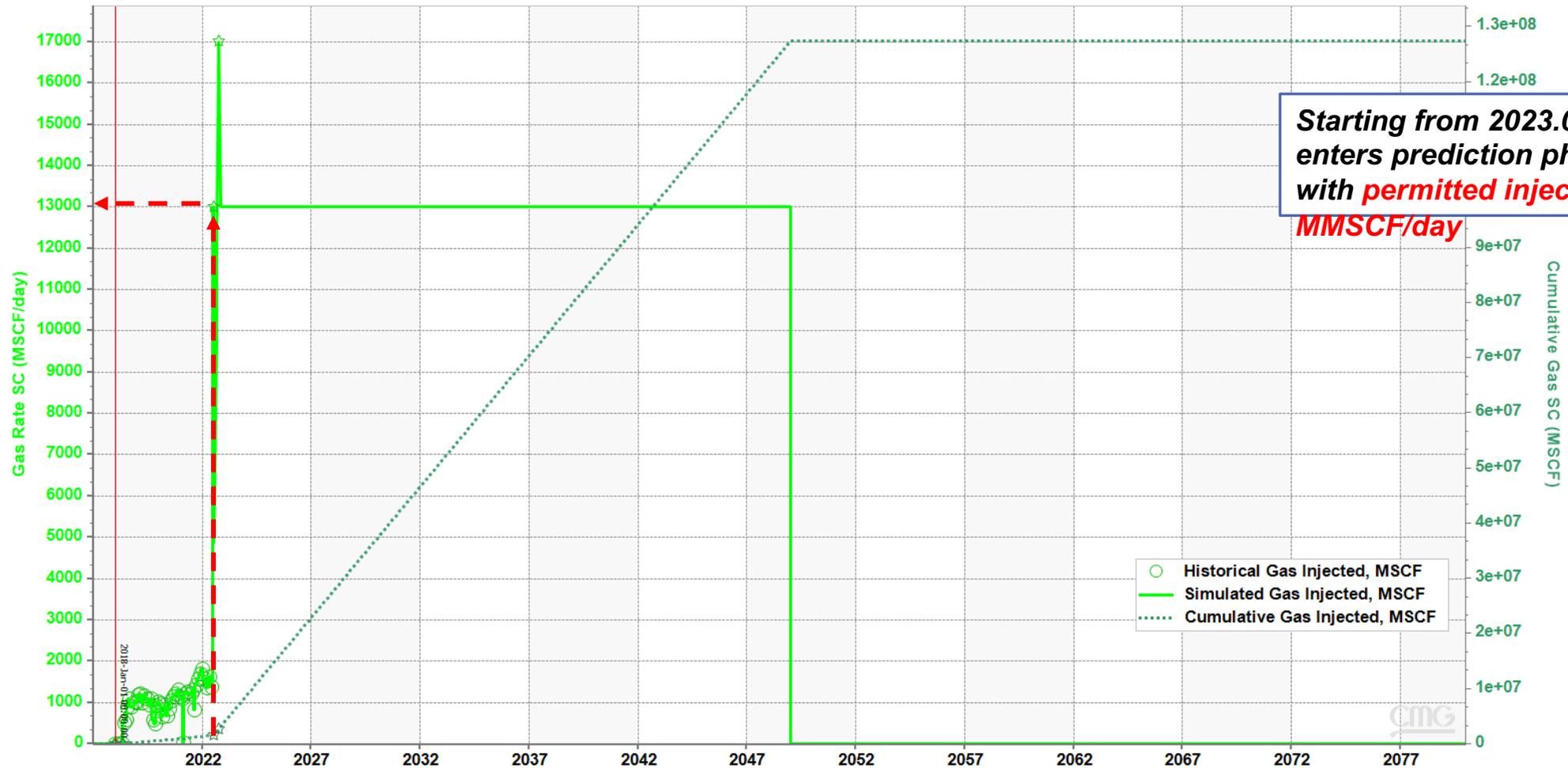
**As of
2022/06**



The distance between the TAG plume front to the Gov. _L COM_#001 is 0.667 miles

Prediction – Gas Rate

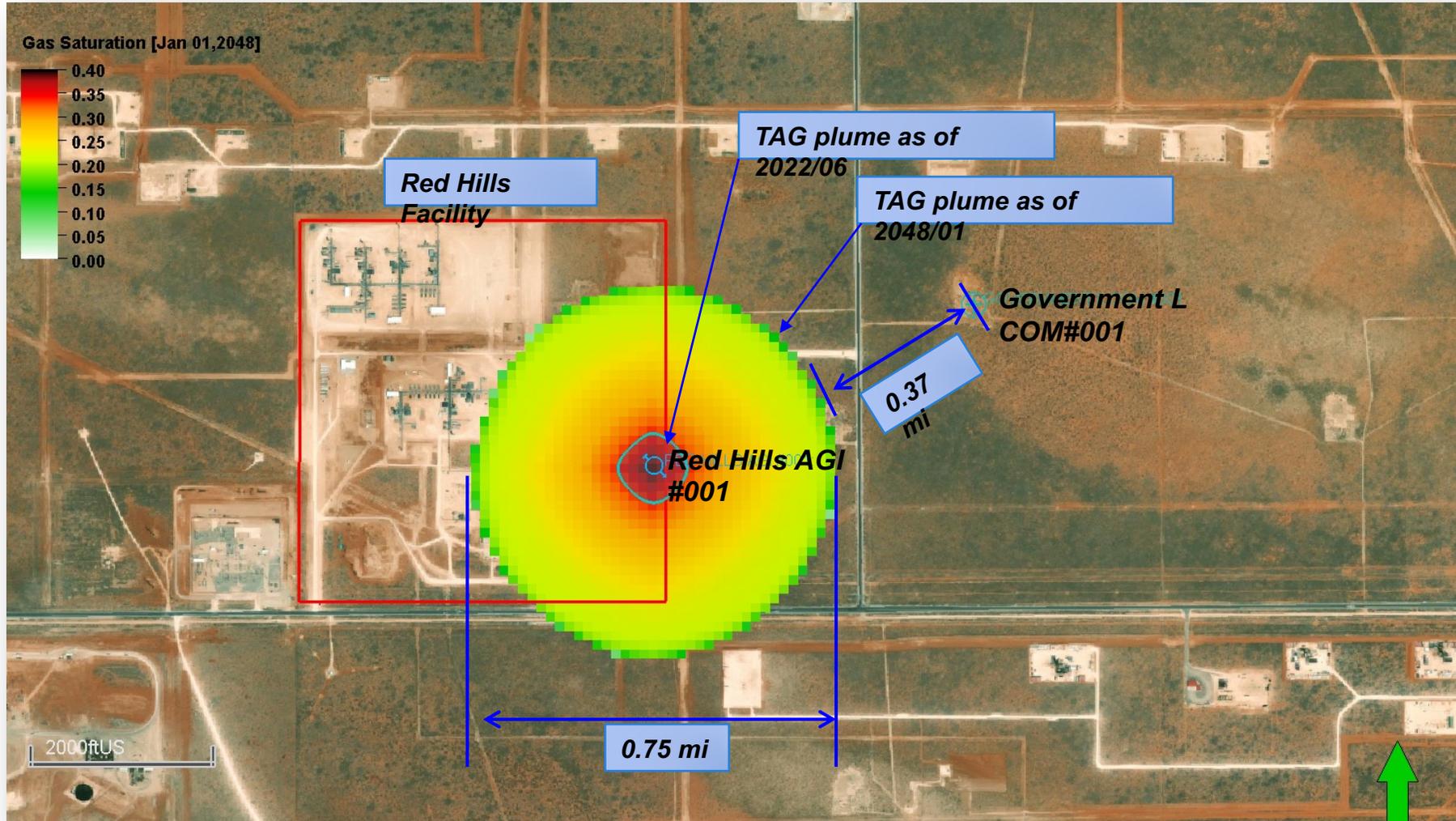
Gas Rate SC - RED HILLS AGI #001_



Starting from 2023.01.01, the simulation enters prediction phase to inject TAG with **permitted injection rate 13 MMSCF/day**

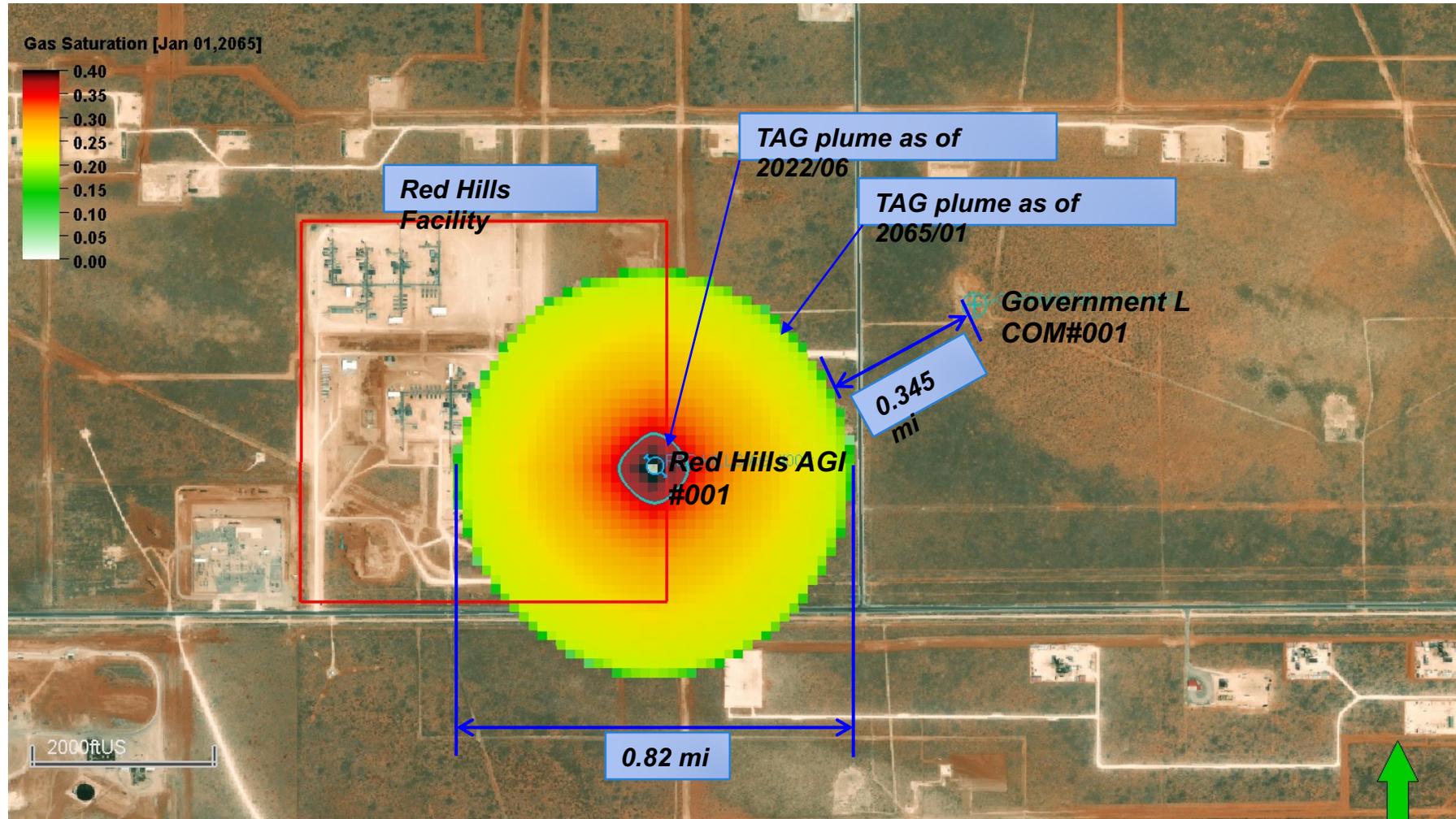
Prediction Results – Gas Plume

*As of 2048
End of injection*

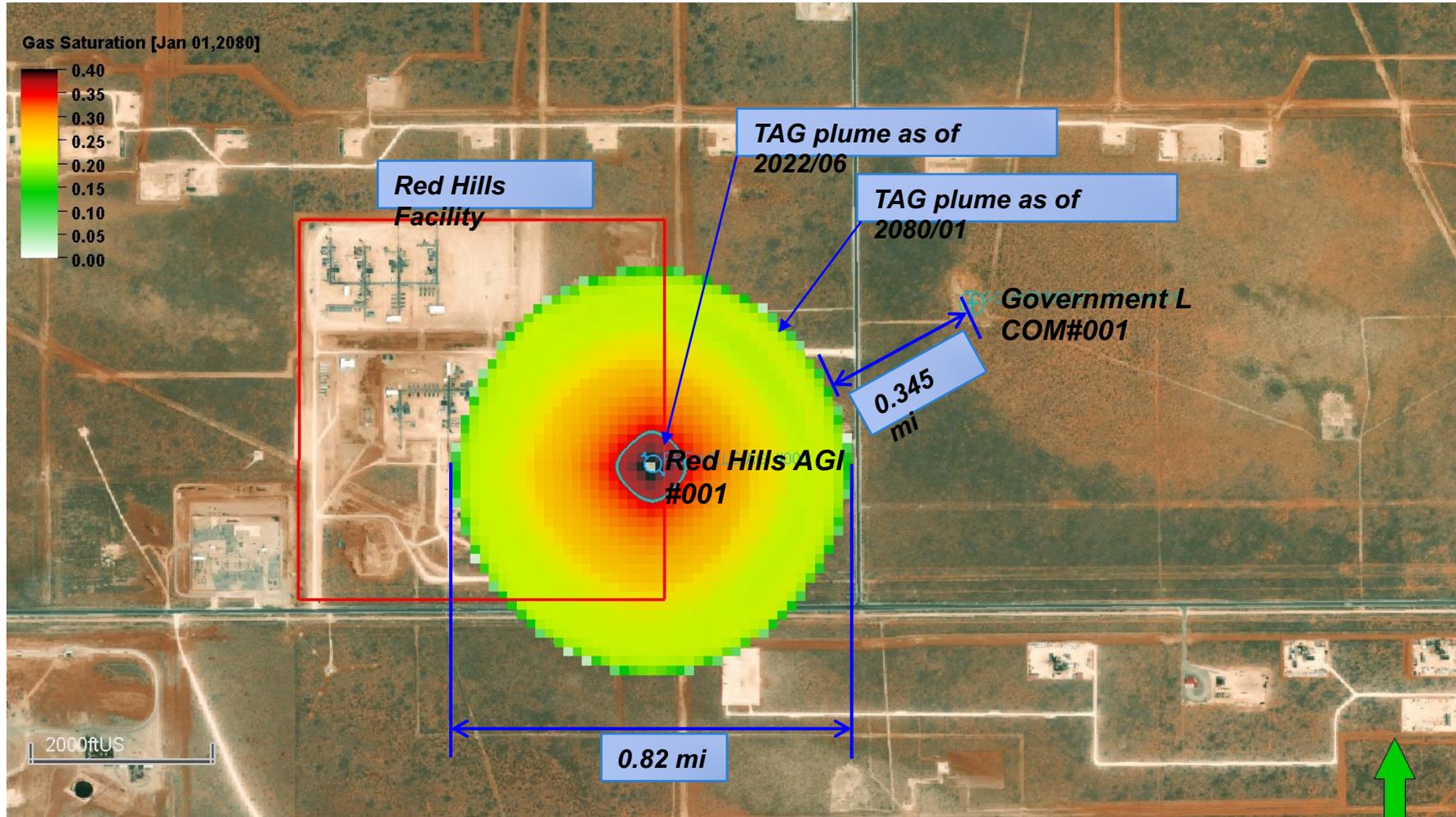


Prediction Results – Gas Plume

*As of 2065
32 years post
injection*

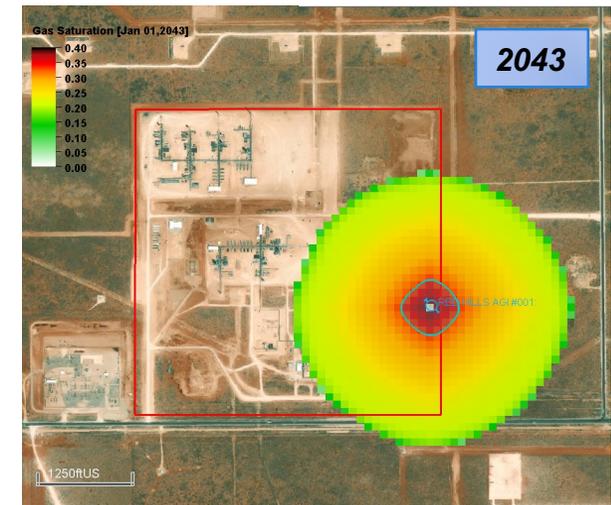
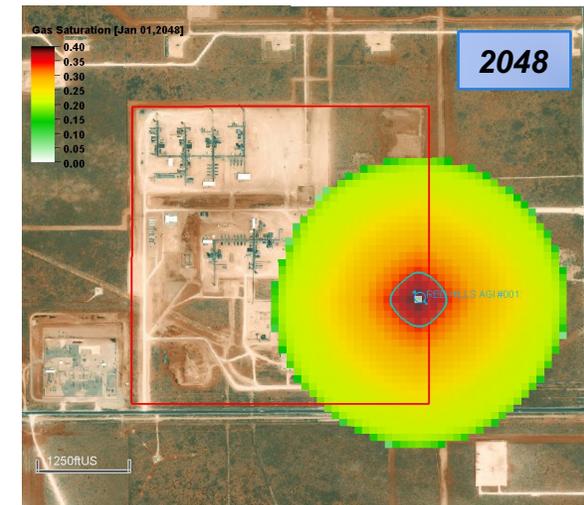
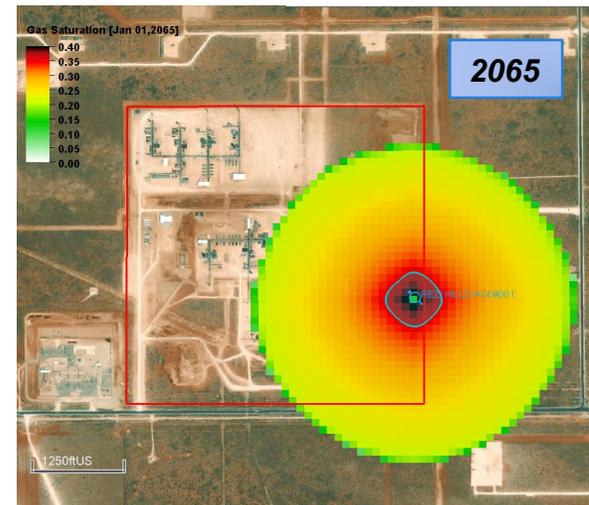
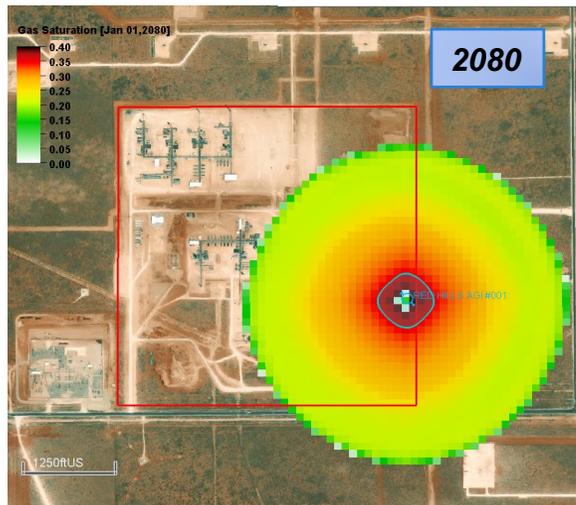
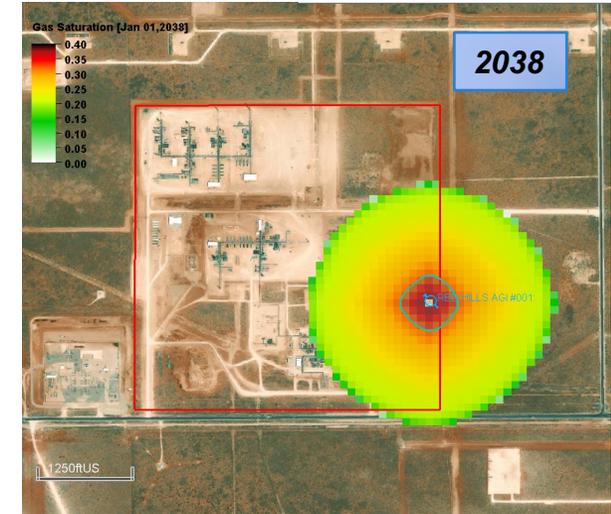
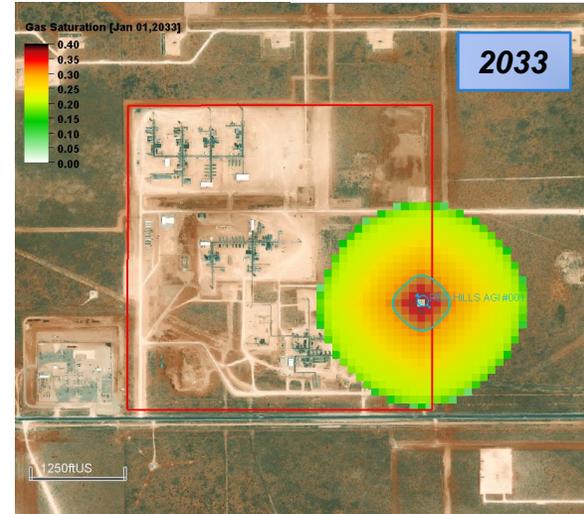
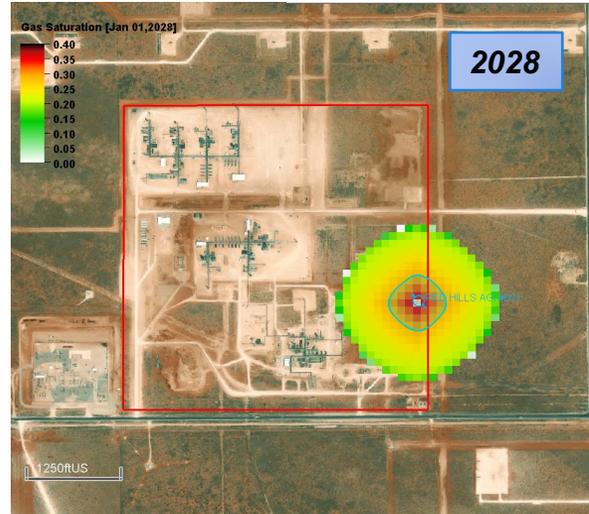
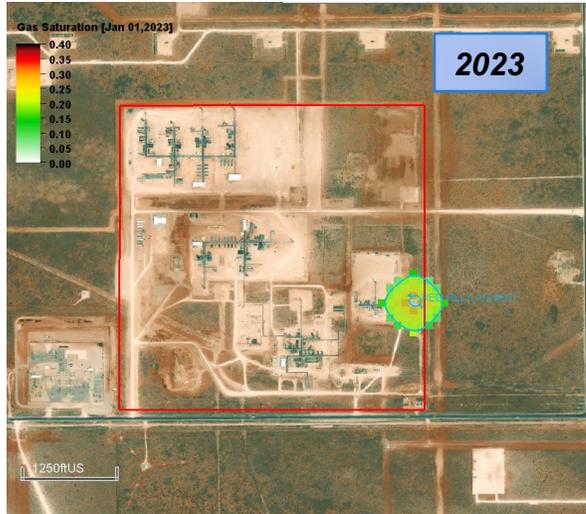


Prediction Results – Gas Plume



*As of 2080
Plume Stopped
migration*

Prediction Results –Plume Development



Conclusions

Based upon careful geologic characterization and reservoir numerical simulation with updated data,

engineers and geologists at the NMT-PRRC performed that:

1. A new geologic model was constructed with newly delineated formations from updated well tops and structural features.
2. High-fidelity reservoir numerical simulation of the projected scope of 30 years of TAG injection given historical TAG injection rate and composition in RH AGI#1 well, and adjacent legacy well activities.

It is found that:

1. The average TAG injection rate through RH AGI#1 well in the past 4 years (since 05/2018) is 1.2 MMSCF/day, which is less than 10% of the permitted max rate of 13MMSCF/day.
2. The distance between RH AGI#1 well and Gov. L C.#2 well is 0.735 miles; **and** as of 06/2022, the diameter of the TAG plume resultant by RH AGI#1 well is estimated to be 0.142 miles; **and** the TAG plume front is estimated to be 0.667 miles away from the Gov. L C.#2 well (**91%** of the distance between RH AGI#1 well and Gov. L C.#2 well).
3. Continue with the permitted maximum TAG injection rate of 13 MMSCF/day from the end of the fifth(5th) year of the injection period, the diameter of the TAG plume resultant by RH AGI#1 well at the end of the 30-year injection is newly predicted to be 0.75 miles; **and** the TAG plume front is predicted to be 0.37 miles away from the Gov. L C.#2 well (**50%** of the distance between RH AGI#1 well and Gov. L C.#2 well).
4. Continue with post-30-year active TAG injection monitoring, the maximum diameter of the TAG plume resultant by RH AGI#1 well is predicted to be 0.82 miles; **and** the TAG plume front is predicted to be 0.345 miles away from the Gov. L C.#2 well (**47%** of the distance between RH AGI#1 well and Gov. L C.#2 well).

It is concluded that:

1. The historical TAG injection rate (1.2 MMSCF/day on average) of RH AGI#1 well has been drastically under the permitted rate of 13MMSCF/day.
2. The TAG plume resultant by RH AGI#1 well poses a diminutive impact on the Gov. L C.#2 well even after 40 years post 30-year active TAG injection activity.