



RAILROAD COMMISSION OF TEXAS

HEARINGS DIVISION

OIL & GAS DOCKET NO. 08-0289658

THE APPLICATION OF JAMES LAKE MIDSTREAM, LLC PURSUANT TO STATEWIDE RULE 36 AND STATEWIDE RULE 46 FOR A COMMERCIAL PERMIT TO INJECT FLUID CONTAINING HYDROGEN SULFIDE INTO A RESERVOIR PRODUCTIVE OF OIL OR GAS; JAMES LAKE INJECTION LEASE, WELL NO 1; GOLDSMITH (ELLENBURGER) FIELD; ECTOR COUNTY, TEXAS

HEARD BY: Brian Fancher, P.G. – Technical Examiner
Michael Crnich – Legal Examiner

REVIEWED BY: Laura Miles-Valdez - Legal Examiner

APPEARANCES:

APPLICANT:

Mickey Olmstead
Richard Lonquist
Steve Pattee
Nathaniel Byers
Craig Tilley
Dr. Peter Jordan
Dale Harper

REPRESENTING:

James Lake Midstream, LLC

RESPONDENT:

Tim George
William Duncan
Demarco Jones
Tim Nuttall
Ray Raymond

XTO Energy, Inc.

EXAMINERS' REPORT AND RECOMMENDATION

STATEMENT OF THE CASE

This application is unopposed. James Lake Midstream, LLC ("Applicant") requests a commercial permit to dispose of oil and gas waste in the James Lake Injection Lease, Well No. 1 (API No. 42-135-43042) ("the subject well or the well") pursuant to Statewide Rule 36 (*Oil, Gas, or Geothermal Resource Operation in Hydrogen Sulfide Areas*) and Statewide Rule 46 (*Fluid*

Injection into Productive Reservoirs). Applicant requests to dispose of up to four-million (4,000,000) cubic feet of gas per day containing roughly 500,000 parts per million (“ppm”) hydrogen-sulfide gas (“H₂S”), or fifty-percent H₂S.

The well has been drilled and completed, and is reportedly located one and one-half (1.5) miles south of Goldsmith, Texas and eleven (11) miles northwest of Odessa, Texas in the T & P R.R. Survey (A-275), Block 44, Section 11. XTO Energy, Inc. (“XTO”) appeared at the hearing in support of the application.

With respect to the subject well, the Commission’s Statewide Rule 36 does not define “affected persons” in conjunction with the application, a notice of application (“NOA”), or notice of public hearing to be issued. On February 14, 2014, Applicant provided NOA for the subject application in accordance with Statewide Rule 46(c), and the following person/entities were given a copy of the application: (1) surface owner of the well’s tract (*i.e.*, XTO); (2) oil and gas operators within one-half mile of the well’s location (*i.e.*, XTO); (3) the Ector County Clerk; and (4) the surface owners of all adjacent tracts to the well’s subject tract (*i.e.*, XTO). In addition, Applicant published notice of the application on February 19, 2014 in the *Odessa American*, a newspaper of general circulation in Ector County, Texas. Per the Applicant’s request, the examiners take Official Notice of the Commission’s Oil & Gas Final Order Numbers 08-0286879 and 08-0287419, which granted authority to James Lake Midstream LLC to construct sour gas pipelines directly associated to the subject well in Andrews and Ector Counties, Texas.

DISCUSSION OF THE EVIDENCE

The subject application was rendered administratively complete by the Commission’s Oil & Gas Division and no protest in opposition to the subject application was received by the Commission. The subject application would have been granted administratively if not for the volume and concentration of hydrogen-sulfide (“H₂S”) disposal in the well.

A public hearing is required by rule in the instant case because the application includes disposal of H₂S where the 100 part per million radius of exposure of H₂S exceeds 3,000 feet¹. All persons required to be noticed of the subject application were provided notice in accordance with Statewide Rule 46. Statewide Rule 36, which is the governing rule that requires a public hearing, does not contemplate “affected persons” in the instant case nor does it offer any guidance as to what an Applicant must prove to be granted authority pursuant to Statewide Rule 36(c)(10).

¹ See 16 Tex. Admin. Code §3.36(c)(10)

Governing Statutes and Commission Rules²Statewide Rule 36 [16 Tex. Admin. Code §3.36]

In general, Statewide Rule 36 applies to each operator who conducts operations associated with hydrocarbon fluids that contain H₂S as a gas constituent, where H₂S is encountered through field production, transportation, and handling of said hydrocarbon fluids³. The subject application falls within the applicability of Statewide Rule 36 and must provide safeguards to protect the general public from the harmful effects of H₂S. Although a hearing is required by Statewide Rule 36, it offers no legal or technical requirements or guidance as to what must be shown to obtain authority from the Commission to inject H₂S. Statewide Rule 36(c)(10) states the following:

(A) Injection of fluids containing hydrogen sulfide shall not be allowed under the condition specified in this provision unless first approved by the commission after public hearing:

(i) where injection fluid is a gaseous mixture, or would be a gaseous mixture in the event of a release to the atmosphere, and where the 100 ppm radius of exposure is in excess of 50 feet and includes any part of a public area except a public road; or, if the 500 ppm radius of exposure is in excess of 50 feet and includes any part of a public road, or if the 100 ppm radius of exposure is 3,000 feet or greater;

(ii) where the hydrogen sulfide content of the gas or gaseous mixture to be injected has been increased by a processing plant operation.

(emphasis added)

Statewide Rule 46

Statewide Rule 46 requires that a permit be approved to conduct fluid injection operations in a reservoir productive of oil, gas, or geothermal resources. If no protest from any affected person is received by the Commission, the Commission's delegate may administratively approve the application without the need for a public hearing⁴. Statewide Rule 46(c)(5)(B) defines "affected persons" as the following:

[A] person who has suffered or will suffer actual injury or economic damage other than as a member of the general public or as a competitor, *and* includes surface owners of property on which the well is located and commission-designated operators of wells located within one-half mile of the proposed disposal well. *(emphasis added)*

² The Commission's Statewide Rules 36 and 46 were the only rules considered; however, the subject well is not limited to Rules 36 and 46, and is required to comply with any and all applicable Commission regulations.

³ See 16 Tex. Admin. Code §3.36(a).

⁴ See 16 Tex. Admin. Code §3.46(c)(6)

When an application is made for “commercial” injection or disposal, the notice of application must be extended to the adjacent offset surface owners to the subject well’s tract⁵.

Chapter 27 of the Texas Water Code

2 Texas Water Code §27.051(b) states:

The railroad commission may grant an application for a permit under Chapter 27 of the Texas Water Code, Subchapter C in whole or part and may issue a permit if it finds:

1. The use or installation of the injection well is in the public interest;
2. The use or installation of the injection well will not endanger or injure any oil, gas, or other mineral formation;
3. That, with proper safeguards, both ground and surface fresh water can be adequately protected from pollution; and
4. The Applicant has made a satisfactory showing of financial responsibility as required by Section 27.073.

Application History

Mr. Stephen Pattee testified as a fact witness on behalf of the Applicant. Mr. Patee holds a masters degree in petroleum engineering. Mr. Pattee testified that the initial administrative application was filed on February 14, 2014, which is made-up of completed Commission Forms H-1 and H-1A, Form H-9, a Ground Water Protection determination letter, 1/4-mile and 1/2-mile area-of-review (AOR) maps, a location plat, geophysical and petrophysical data related to the well and the well’s immediate environs, a 50-year plume model of the disposed H₂S, a certification made of affected persons that were provided notice of application, and an affidavit of publication. Subsequently, on March 10, 2014, Applicant submitted several addendums to the initial application due to moving the well’s surface location 25 feet from its originally proposed location (Transcript, Pg. 33, L. 1-4).

On April 17, 2014, the Commission’s Oil and Gas Division (“Staff”) issued a letter to Applicant requesting further clarification of the subject application (*i.e.*, a RAD letter). On April 23, 2014, Applicant submitted its response to Staff’s April 17, 2014 RAD letter. On May 28, 2014, Staff rendered the subject application administratively complete. On June 6, 2014, Mr. David Hill, Manager of the Commission’s Underground Injection and Control group requested a hearing pursuant to Statewide Rule 36.

On July 1, 2014, a Notice of Hearing (“NOH”) was issued for the subject application by the Commission. The NOH was provided to the Applicant, XTO, and Mr. David Hill. On July 25, 2014, the subject application was heard. On July 31, 2014, Applicant’s counsel submitted several late-filed exhibits that were requested by the examiners at the hearing. On September 29, 2014, Applicant’s counsel submitted a proposed Examiners’ Report and Recommendation and Final Order.

⁵ See 16 Tex. Admin. Code §3.46(c)(2)

The Facility

Canyon Midstream Partners (“Canyon”) is the parent company of James Lake Midstream, LLC. The subject well’s facility (“the James Lake Plant”) is situated on a 100-acre tract of land purchased by Canyon from XTO. Canyon designated 51.65-acres of the total 100-acre tract as the James Lake Plant-proper.

The general purpose of the James Lake Plant (“JLP”) is to transport, handle, and process natural gas laced with H₂S and CO₂ that is produced by third party operators, such as XTO and Occidental Petroleum, so that sellable hydrocarbon products can be delivered to market. The JLP consists of the subject well, inbound and outbound pipelines, and numerous pieces of associated surface equipment (*e.g.*, gas compressors, tanks, buildings, flare stack). There are two high-pressure pipelines that bring acid gas to the JLP: the Cottonwood Lateral (“CLHP”) and the James Lake Gathering (“JLHP”)⁶. The JLP’s two outbound pipelines include a Natural Gas Liquids (“NGL”) pipeline and a Residue pipeline.

The JLP is bound by a 1,500' x 1,500' square fenced area. From an aerial view, the subject well is located at the JLP’s northeast corner. The JLP’s western boundary is situated approximately 1,500 feet east of Ranch Road 866. The JLP’s northwest corner is located about 1.3 miles from the intersection of Alma Street and East Gulf Avenue (Texas Highway 158) in Goldsmith, Texas⁷.

The JLP’s operational scheme (“process-flow”) indicates that the process-flow begins with the incoming product entering the JLP through the CLHP and JLHP. The liquid (*i.e.*, condensate) then is removed from the incoming product and stored in the onsite condensate tanks. The remaining parts of the incoming product (*i.e.*, the natural gas) are sent to an amine unit for removal of the H₂S and CO₂. After the H₂S and CO₂ are removed by the amine unit, the H₂S and CO₂ are compressed for disposal in the subject well.

The JLP’s perimeter is surrounded with six H₂S monitors, and the interior is dotted with ten H₂S monitors. In addition to the sixteen H₂S monitors, the JLP is constructed with ten emergency shut-down valves. Each of the JLP’s sixteen H₂S monitors is programmed to shut-in the JLP if a monitor detects H₂S in the air at 30 ppm or more. If the JLP is shut-in due to detection of H₂S by one of the sixteen H₂S monitors, the remaining gas in the JLP will be directed to an emergency flare for incineration.

The JLP is located approximately one mile south of Goldsmith, Texas and 11 miles northwest of Odessa, Texas. Applicant submitted a wind rose diagram⁸ to show the average wind speed and direction at the JLP’s location. The representative wind rose diagram is based on data

⁶ Exh. 22 and 23.

⁷ Exh. 2

⁸ Applicant’s late-filed Exh. 36.

from 2005, and indicates that prevalent wind direction is south-southeast and southeast at over fifteen miles per hour.

Well Construction (Drilling, Casing, Cementing, and Completion)

On April 30, 2014, Applicant received an approved drilling permit for the well from the Commission's Oil & Gas Division⁹. Mr. Patee testified that the well was drilled, cased, and cemented in the following manner¹⁰:

1. **Surface-casing string:** 13-3/8" set from surface to 1,472 feet; 1,275 sacks of cement; circulated cement to surface; drill-hole size of 17-1/2".
2. **Intermediate-casing string:** 8-5/8" set from surface to 4,877 feet; DV tool at 2,470 feet; 2-stage cement; 1,760 total sacks of cement; cement circulated to surface; drill-hole size of 12-1/4".
3. **Production-casing string:** 5-1/2" set from surface to 12,530 feet; DV tool at 4,873 feet; DV tool at 8,861 feet; 3-stage cement; 1,400 total sacks of cement; cement circulated to surface; drill-hole size 7-7/8".

In addition, Mr. Patee testified that the a lower portion of the well's production casing string was cemented with specialized H2S-resistant casing and cement (Tr., Pg 45, L. 1-17).

Disposal Interval and Geologic Evidence

Applicant's proposed injection interval was amended several times throughout the application and hearing process. Ultimately, Applicant proposed injection interval spans from 12,576 feet to 13,129 feet below the ground surface at the well's location (Tr., Pg. 11, L. 19-23; Pg. 70, L. 17-20). The proposed injection interval includes the Joins and Ellenburger formations (Tr., Pg. 80, L. 1-3). The proposed injection interval is capped by impervious shale beds within the Simpson Group (*i.e.*, the Silurian shale, the Woodford shale, the Barnett Shale).

Mr. Craig Tilley testified as to the subsurface geology in conjunction with the subject application. Mr. Tilley holds a masters degree in geology. Mr. Tilley presented a subsurface contour map of the Ellenburger formation, and a well-log cross section that traverses from south to north. Mr. Tilley testified that the top of the Ellenburger formation is situated approximately 9,500 feet below the surface at the well's location, that the Ellenburger's updip direction is due west of the well, and that the Ellenburger formation is approximately 700 feet thick at the well's location. Mr. Tilley testified that a fault of unknown type ("the primary fault") exists approximately one mile south of the well's location (Tr., Pg. 71, L. 3). The trapping beds above the Ellenburger (*i.e.*, the Simpson Group) are all affected by the primary fault and are likely to have smeared against the primary fault. Furthermore, the smearing of the Simpson Group at the primary fault offers a permeability barrier

⁹ Exh. 24.

¹⁰ Exh. 25 - As drilled wellbore schematic.

to any fluid migration up the fault plane (Tr., Pg. 71, L. 17-25). Beyond that, he stated that the injectate's 50 year plume migration will not encounter the primary fault identified in the Ellenburger's contour map¹¹. There are no wellbores within the injectate plume that penetrate the proposed injection interval. In summary, Mr. Tilley contends that the proposed injection interval is a good candidate for the subject application "because it's in an area away from other wells, it has good shale seals above it, and that the Ellenburger and its seals are concurrently continuous in the area" (Tr., Pg. 76, L. 15).

Disposal Fluids

Applicant's proposed disposal stream is made of saltwater, CO₂, H₂S, and RCRA-exempt oil and gas wastes¹². Applicant seeks to dispose of up to four-million (*i.e.*, 4,000,000) cubic feet of gas per day ("CFGPD") in the well, where it will be stored in the well's proposed injection interval. The material that makes-up the 4,000,000 CFGPD ("injectate") is more or less comprised of the following components and percentages, presented in molar fraction¹³:

	<u>Compound</u>	<u>Mole Fraction</u>
1.	Hydrogen-sulfide ("H ₂ S")	45.3%
2.	Carbon-dioxide ("CO ₂ ")	54.5%
3.	Methane ("CH ₄ ")	>1% (less than 1%)
4.	Ethane ("C ₂ H ₆ ")	>1%
5.	Propane ("C ₃ H ₈ ")	>1%
6.	n-Butane ("C ₄ H ₁₀ ")	>1%

In other words, of the total injectate to be disposed into the well approximately 45.3% will be H₂S and 54.5% CO₂, or 453,000 parts per million ("ppm") H₂S and 545,000 parts per million CO₂.

The injectate will be in supercritical phase when transported to the well by pipeline and disposed in the well (Tr., Pg. 142, L. 23). Generally, if the injectate escapes containment while in supercritical phase, the injectate will transform into gas phase.

Subsurface Plume Model

As previously mentioned, the well's injectate will consist of roughly 50% H₂S and 50% CO₂. Dr. Peter Jordan testified on behalf of James Lake with regard to a subsurface computer model ("the model") that was constructed in conjunction with the subject application. Dr. Jordan holds a doctorate degree in physical plant ecology and has spent 22 years as a consultant specializing in waste injection wells. The model is based on 25 years of active injection and 25 years of inactivity in the well. The model's purpose is to project the anticipated extent and direction (*i.e.*, migration)

¹¹ Exh. 30

¹² Exh. 33.

¹³ Exh. 14.

that the injectate will travel once it enters the proposed injection interval (*i.e.*, the Joins and Ellenburger formations) in the subsurface. The model supposes that the injectate will expand radially in the subsurface, and subsequently will exhibit lateral drift due to the density contrasts between the injectate and the naturally occurring water in the proposed injection interval (Tr., P. 86, L. 4-14; Pg. 87, L. 24). Dr. Jordan's concluded that the well's injectate will extend 5,030 feet from the well after 50 years, and will travel due west of the well (*i.e.*, updip)¹⁴ (Tr., 92, L. 3-23; Tr., P. 97, L. 5-15). In addition, the model indicates that the injectate plume will extend parallel to the primary fault; however, his testimony indicated the injectate plume will not encroach upon the fault (Tr., Pg. 34, L. 23-25).

While the model was ultimately based on data from the subject well after it was drilled, initially the model was based on parameters which include an injection rate of 2,800 MCFGPD. After discussion with Commission Staff, the model's daily injection rate was increased to Applicant's sought-after daily maximum authority of 4,000 MCFGPD (Tr., Pg. 84, L. 5).

H2S Radius of Exposure (ROE) Calculations

On March 21, 2014, the Oil and Gas Division approved the well's Form H-9, which indicates that the maximum escape volume of gas per day from the well will be 2,800 MCFGPD¹⁵. However, the subject application includes a maximum daily injection volume of 4,000 MCFGPD. Although Applicant seeks a maximum daily disposal rate of 4,000,000 CFGPD, the well's 100 and 500 ppm radii of exposure ("ROE") were calculated using the anticipated daily average disposal rate of 2,800,000 CFGPD, or 2800 thousand cubic feet of gas per day ("MCFGPD"). At 2,800 MCFGPD, the 100 and 500 ppm ROEs extend 9,380 feet and 2,800 feet from the subject well, respectively.

H2S Contingency Plan

The well's approved form H-9 indicates there are two public roads within the 100 ppm and 500 ppm ROEs (FM 866 and FM 158). James Lake submitted a contingency plan that covers both the subject well and the gathering systems associated with the well. The plan provides for measures to be taken to notify the public and emergency responders and to minimize risks to public health and safety in the event of a leak of a potentially hazardous volume of H₂S. The contingency plan has been reviewed and approved by the Commission's Field Operations section.

Public Interest

Mr. Pattee testified that the subject well meets public interest requirements because the amount of flaring that occurs in the area surrounding the subject well will be lowered, it will allow for more natural gas to be sold to market., and it will capture and sequester sulfur and greenhouse gases, such as carbon dioxide, which will protect persons from harm (Tr., Pg. 59, 12-25).

¹⁴ See Exh. 32, pg. 11 and Exh. 30.

¹⁵ Exh. 15 - Form H-9.

Applicant's counsel opined that there is a need for the subject well due to the lack of capacity in the area surrounding the subject well. Furthermore, Applicant's counsel believes that approval of the subject application will reduce flaring in the area of the well, which is a significant problem (Tr., Pg. 130, L.15-18).

Counsel on behalf of XTO concluded that there is a public interest in approval of the subject application because there is a need for a dependable system of transporting natural gas that's sour to market. XTO's counsel further believes that the subject application is in the public's interest because of the geographic area's capacity limitations, and because the subject well's proposed disposal is the "best place to place the acid gas from the JLP".

Organization Report and Financial Security

Applicant has an active Form P-5 (Organization Report) and has financial security posted with the Commission in the form of a \$25,000 bond¹⁶.

FINDINGS OF FACT

1. Pursuant to 16 Texas Administrative Code §§3.36 ("Statewide Rule 36") and 3.46 ("Statewide Rule 46"), James Lake Midstream, LLC ("Applicant") seeks a commercial disposal permit for its James Lake Injection Lease, Well No. 1 (API No. 42-135-43042) ("the subject well or the well") to commercially dispose of oil and gas waste.
2. Applicant seeks a commercial disposal permit for the subject well to dispose of up to 4,000,000 cubic feet of natural gas per day, which contains 45.3% Hydrogen-sulfide ("H₂S") and 54.5% Carbon-dioxide ("CO₂").
3. Notice of the application was published in the *Odessa American*, a newspaper of general circulation in Ector County, Texas on February 19, 2014.
4. Applicant's subject application was noticed pursuant to Statewide Rule 46.
5. The subject application requires a public hearing pursuant to Statewide Rule 36(c)(10).
6. Statewide Rule 36 does not require notice to persons for an application pursuant to Statewide Rule 36(c)(10).
7. Statewide Rule 36 does not stipulate any technical requirements for an Applicant to fulfill in order to be granted authority pursuant to Statewide Rule 36(c)(10).

¹⁶ Exh. 8.

8. Applicant's subject application was rendered administratively complete by the Railroad Commission's Oil and Gas Division's Staff on May 28, 2014.
9. Applicant seeks a commercial disposal permit for the subject well to dispose of H₂S and CO₂ in the subject well from 12,576 feet to 13,129 feet ("the proposed injection interval") at the subject well's location.
10. Applicant's proposed injection interval is limited to the Joins and Ellenburger geologic formations.
11. The Ellenburger formation is approximately 700 feet thick at the subject well's surface location.
12. The Simpson Group lies stratigraphically above the well's proposed injection interval.
13. The subject well is cased and cemented in a manner that will confine injected fluids to the subject well's proposed injection interval at the subject well's location.
14. Usable quality water will be protected from harm at the subject well's location.
15. The gas to be disposed of in the subject well originates as sour casinghead gas.
16. The sour casinghead gas will be piped to the subject well, where sour casinghead gas will be processed for removal of H₂S and CO₂.
17. Operation of the subject well will provide for a means of commercial disposal of H₂S and CO₂.
18. The subject well and the James Lake Plant ("JLP") are designed to contain sour gas installed monitoring devices will shut-in the subject well and the JLP if thirty parts per million or more of H₂S is detected in the air at the JLP.
19. The subject well's 100 and 500 part per million radii of exposures were calculated to extend 9,380 feet and 4,285 feet, respectively, at a maximum escape volume of 2,800,000 cubic feet of gas per day.
20. Applicant has a current approved Form P-5 (Organization Report) and has posted a \$25,000 bond as financial assurance.

CONCLUSIONS OF LAW

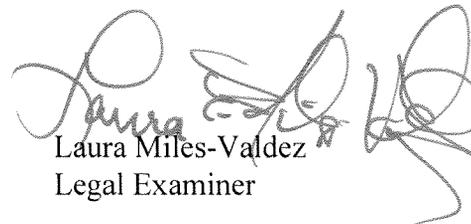
1. On February 14, 2014, James Lake Midstream, LLC provided Notice of Application in accordance with 16 Texas Administrative Code §3.46 for its proposed commercial disposal permit for its James Lake Injection Lease, Well No. 1 (API No. 42-135-43042).
2. All things have occurred to give the Railroad Commission jurisdiction to consider this matter.
3. Use of the subject well for commercial disposal of saltwater, hydrogen sulfide, carbon dioxide, and RCRA-Exempt oil and gas wastes into the Joins and Ellenburger geologic formations is in the public interest.
4. Applicant has made a satisfactory showing of financial responsibility to the extent required by Section 27.073 of the Texas Water Code.

EXAMINERS' RECOMMENDATION

The Examiners recommend that James Lake Midstream, LLC's application for its proposed James Lake Injection Lease, Well No. 1 be APPROVED for commercial disposal.



Brian Fancher, P.G.
Technical Examiner



Laura Miles-Valdez
Legal Examiner