



RAILROAD COMMISSION OF TEXAS

HEARINGS DIVISION

OIL AND GAS DOCKET NO. 08-0295744

THE APPLICATION OF FULCRUM DELAWARE WATER RES, LLC PURSUANT TO STATEWIDE RULE 46 FOR A PERMIT TO INJECT FLUID INTO A RESERVOIR PRODUCTIVE OF OIL OR GAS, CHAPMAN SWD, WELL NO. 2, HUBBARD (CHERRY CANYON) FIELD, LOVING COUNTY, TEXAS

PROPOSAL FOR DECISION

HEARD BY: Richard Eyster, P.G. – Technical Examiner
John Dodson – Legal Examiner

APPEARANCES:

REPRESENTING:

APPLICANT:

Clay Nance
Michael Burress
Matt Spicer
Brian Willey
Krystal Eversdyk
James Armer
Howard Mc Laughlin
Larry Carlisle

Fulcrum Delaware Water Res., LLC

Trent Green

Matador Resources

PROTESTANT:

Mark Bragg

Claude-Maggie Oil Company

PROCEDURAL HISTORY

Application Filed:	February 26, 2015
Protest Received:	February 27, 2015
Date of Hearing:	May 14, 2015
Transcript Received:	May 27, 2015
Proposal For Decision Issued:	October 27, 2015

STATEMENT OF THE CASE

Fulcrum Delaware Water Res., LLC, (Fulcrum) requests authority pursuant to Statewide Rule 46¹ to inject fluid into the lower Bell Canyon Formation and Cherry Canyon Formation in the Chapman SWD Lease, Chapman-2 Well, Hubbard (Cherry Canyon) Field, Loving County, Texas (Chapman-2). The proposed well is a commercial disposal well for the disposal of produced saltwater and RCRA-exempt waste in the Hubbard (Cherry Canyon) Field, Loving County, Texas.² The well site is located about 0.9 miles in a southerly direction of the town of Mentone, in the W.M. Smith Survey, A-466, Loving County, Texas. The proposed Chapman-2 will provide additional capacity for Fulcrums' existing injection well, the Chapman SWD Lease, Chapman-1 Well, Hubbard (Cherry Canyon) Field, Loving County, Texas (Chapman-1 Well), which is located on the same site.

On January 15, 2015, Notice of the subject application was mailed to Loving County Clerk, the surface owner of the subject disposal tract, the surface owners of adjacent tracts, and the operators of offset wells located within a one-half mile radius of the proposed well. Notice of the application was published in the *Pecos Enterprise*, a newspaper of general circulation in Loving County, on January 09, 2015.

The application is protested by Mark Bragg, owner of Claude-Maggie Oil Company, an offset well operator. Claude -Maggie has a water flood operation, the Feldman-3 Well (API No 42-301-10023), which is located 726 feet southeast of the proposed injection well. Mr. Bragg is concerned the proposed injection well will harm his production.

As addressed below, the Examiners recommend that the Commission approve the application.

Applicable Law

The Railroad Commission may grant a permit under Chapter 27 of the Texas Water Code, Subchapter D, in whole or part, and may issue a permit to dispose of fluids by underground injection 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;

¹ 16 Tex. Admin. Code § 3.46 (Fluid Injection Into Productive Reservoirs)

² Resource Conservation and Recovery Act: Examples of RCRA exempt oil and gas waste includes produced water, drilling fluids, hydraulic fracturing flow back fluids, rig wash and workover wastes.

3. 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.

DISCUSSION OF THE EVIDENCE

FULCRUM'S EVIDENCE

The proposed Chapman-2 Well will provide additional capacity for its existing Chapman-1 on the same site. The Chapman -1 Well is permitted for 25,000 barrels per day (BBL/D) at 2,320 psi, and is currently averaging 18,000 BBLs/D and 2,100 psi. The applicant stated that due to pressure constraints this well is near capacity and the Chapman-2 Well is needed to handle the current volume of water brought to the site by their customers. Michael Burress, a Fulcrum partner, stated Fulcrum will be handling up to 68,000 BBL/D from their contracted customers by the end of 2016. Fulcrum expects to need the Chapman-2 Well and a third injection well at the site by the end of 2016.³ The proposed Chapman-2 Well will be drilled approximately 3,920 feet (ft) southeast of the Chapman-1 Well.

Fulcrum proposes the injection well be completed and operated as follows:

- Surface casing (13 3/8-inch) will be set to a depth of 800 feet, 50 feet below the base of the usable-quality groundwater (BUQW) and cement will be circulated to surface.
- Intermediate casing (10 3/4-inch) will be set to a depth of 4,400 feet with cement circulated to surface.
- Long-string casing (7 5/8-inch) will be set to a depth of 5,800 feet with cement circulated to surface.
- Injection tubing (4 -1/2 inch) will be run inside the long string casing and a packer will be set at a depth of 4,350 feet 50 ft above the top of the injection interval.
- The injection interval will be from 4,400 ft to 5,800 ft into the lower portion of the Bell Canyon Formation and the Cherry Canyon Formation.
- The maximum daily injection volume will be 25,000 barrels per day, with an average daily injection volume of 20,000 barrels per day.
- The maximum surface injection pressure will be 2,200 pounds per square inch (psi).

³

Tr. 30:1-24

- The proposed well will receive produced salt water and RCRA-exempt waste for disposal via a pipeline connected to Fulcrum's existing surface facility.
- Surface facilities will comply with standard permit conditions for commercial disposal well facilities, including secondary containment.

GROUNDWATER PROTECTION

The Commissions' Groundwater Advisory Unit (GAU) has determined that usable quality groundwater occurs from the land surface to a depth of 750 feet. The base of the Underground Source of Drinking Water (USDW) was also determined to be 750 feet. Fulcrum asserts the proposed injection well will be cased and cemented to isolate the BUQW and USDW from the injection interval.

1/4 MILE AREA OF REVIEW

Fulcrum identified nine well bores within the one-quarter mile area of review (AOR) of the proposed Chapman-2 Well. Of the nine wells, four are plugged and abandoned. One well, the A.S. Chapman-2 (API No. 301-10033) as only an expired drilling permit, there are no Commission completion or plugging records indicating that this well was actually drilled. Another well within the 1/4-mile AOR, the Wheat-1X Well (API No. 301-10017) is a dry hole completed at a depth 653 ft. The Protestant has three wells, including one water flood injection well (Feldman-3 Well), (API No. 301-301-10023) and two oil wells, the Feldman-4 Well, (API No. 301-10036) and the Claude-Maggie Chapman-1 Well (CM Chapman-1), (API No. 301-00961). All the wells within the one-quarter mile area of review are completed above the proposed Chapman-2 Well's injection zone of 4400-5800 ft. The deepest of the nine wells is a plugged oil well, the Petroleum Company of Texas' Texfel-Wheat No.1 Well (API No. 301-10043), which has a total depth (T.D.) of 4,329 ft in the Lower Bell Canyon Formation.

The Protestant's three wells within the 1/4 mile area of review are, the Feldman-3 which is the Protestant's water flood injection well. The CM Chapman-1 Well and the Feldman-4 Well are the Protestant's producing oil wells. The three Claude-Maggie wells are completed in the Upper Bell Canyon Formation, also called the Wheat Field. The deepest of the three wells, the CM Chapman-1 Well has a T.D. of 4,303 ft. The closest well to the proposed Chapman-2 Well is the Feldman-3 water flood injection well, located 746 feet west of the proposed injection well. The Feldman-3 Well injects water into the Upper Bell Canyon Formation in an injection interval from 4,217 ft to 4,250 ft and has a T.D. of 4,286. The CM Chapman-1 Well and the Feldman-4 Well are completed above the Applicant's injection interval of 4,400 ft to 5800 ft. The Chapman-1 Well is completed at a depth of 4,303 ft and the Feldman-4 Well is completed at 4,299 ft. None of the Protestant's wells penetrate the Applicants proposed injection interval.

The Protestant has no production in the Cherry Canyon Formation and no production in the Bell Canyon Formation below 4,303 ft. The Applicant's expert geologist, Howard McLaughlin,

testified that from 4,270 ft to 4,400 ft there is a combination of shale layers equaling a 50 ft thick shale permeability barrier that separates the productive sand that exists in the Upper Bell Canyon Formation from the top of the injection interval at 4,400 ft. There is also a 100 ft thick shale barrier at the bottom of the proposed injection zone at 5,800 ft that will isolate the injection zone from the underlying Brushy Creek Formation and the deeper hydrocarbon bearing formations.⁴

SEISMIC EVENTS

Fulcrum's Exhibit No 2., contains the required seismic study. There were no seismic events in a radius of 9.08 kilometers around the proposed well from January 01, 1901 to January 15, 2015 when the application was filed with the Commission.

PUBLIC INTEREST

Michael Burress, a partner and operator with Fulcrum stated that Fulcrum currently operates the Chapman-1 Well on the site of the proposed Chapman-2 Well. The Chapman-1 Well is permitted for 25,000 BBL/D at 2,320 psi, and is currently averaging 2,100 psi and 18,000 BBL/D. The applicant stated that due to pressure constraints this well is near capacity and the Chapman-2 Well is needed to handle the current volume of water brought to the site by their customers. Fulcrum expects to be handling up to 68,000 BBL/D from their contracted customers by the end of 2016. Fulcrum expects to need the Chapman-2 Well and a third injection well at the site by the end of 2016. According to the Applicant, water haulers often have to wait several hours, or travel more than twenty miles. The waiting time and excessive travel times result in higher waste hauling and disposal costs.

Trent Green, Vice President of Production with Matador Resources testified in support of the Chapman-2 Well. Matador Resources expects to serve as the "anchor customer" for the proposed Chapman-2 Well. In addition, Fulcrum has negotiated to provide disposal services to two additional large, exploration and production (E&P) company operating in the immediate vicinity, and is currently in negotiations to provide disposal services to a fourth large E&P company operating in the immediate vicinity. Fulcrum calculated that for 68,000 BBLs, with the number of truck trips at \$1.25/BBL, the savings for their customers will be \$31,000,000 by the end of 2016. This savings will allow their customers to put the savings back into their exploration and production operations.⁵ Mr. Green stated that they will have one drilling rig in Loving County and stated that there is the potential for 302 wells to be drilled in the area, and based on a five-year development program of one rig running for five years Matador is looking at an additional 57-64 wells. Without the proposed well Matador projects water disposal costs will increase from \$1.00 to \$2.50 per barrel. The

⁴ Tr. 65: 6-24, 66: 1-25, 67: 1., 68:17-25; Fulcrum Exhibit 18, P. 2, 4, 10.

⁵ Tr. 29: 6-25., 30:1-25, 31:1-25

additional disposal costs may result in a net loss in reserves of between 450,000 to 700,000 barrels of oil due to increased economic limits, premature abandonment, or delayed development.⁶

PROTESTANTS EVIDENCE:

Claude-Maggie is concerned that the proposed injection activities will harm its nearby production from the Bell Canyon Formation. Claude-Maggie's Feldman-3 Well is located 726 ft southeast of the proposed Chapman-2 Well. Claude-Maggie operates a waterflood project with the Feldman-3 waterflood injection well, injecting into the upper Bell Canyon Formation from 4,217 ft to 4,250 ft.

Mr. Bragg, owner of Claude-Maggie, stated "I am in protest of it due to the fact that I have some production close to it, and water flood production. If they go in there and (inject) 25,000 barrels per day, it's going to flood me out".⁷ Claude-Maggie's injection interval is from 4,217 ft to 4,250 ft which is above the Applicant's proposed injection zone of 4,400 ft to 5800 ft. The Protestant did not call any witnesses, provide any evidence or exhibits to support his claim that the proposed Chapman-2 Well would adversely affect his waterflood operation.

EXAMINERS' OPINION

The Railroad Commission may grant a permit for a disposal well if the application meets the requirements of the Texas Water Code § 27.051(b), (1-4).

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. 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 required by Section 27.073.

The Examiners' conclude the Applicant has adequately demonstrated that the proposed disposal well meets these requirements. A discussion of the required elements in the Texas Water Code § 27.051(b) (1- 4) follows.

⁶. Tr.- 53:5-23

⁷. Tr.-11:,10-15

PUBLIC INTEREST

Operators are continuing to drill wells in the area and the disposal of saltwater and other waste fluids is a necessary aspect of hydrocarbon production. According to the applicant, currently water haulers sometimes have to wait several hours, or travel more than twenty miles. The waiting time and excessive travel times will result in higher water hauling and disposal costs. Permitting the Chapman-2 Well, and piping in the wastewater to the facility will reduce water hauling and disposal costs. It will also decrease traffic on local roads. Matador Resources estimates that if the proposed well is not approved, approximately 450,000 to 700,000 barrels of oil may be in jeopardy of potentially not being produced over the next five years due to higher lease operating expenses associated with the disposal of fluids by trucking to alternative locations. Fulcrums customers will be piping the water to the proposed well which will greatly reduce truck traffic and save money for their customers. Fulcrum calculated that for 68,000 BBLs, the number of truck trips at \$1.25/BBL the savings for their customers will be \$31,000,000 by the end of 2016. This savings will allow their customers to put the savings back into their exploration and production operations. The Examiners conclude the evidence demonstrates that additional disposal capacity is needed in this area.

ENDANGER OR INJURE ANY OIL, GAS, OR OTHER MINERAL FORMATION

Hydrocarbon production in the area of the proposed injection well is within the Upper Bell Canyon Formation, which runs from a depth of 4,200 ft to approximately 4,275 ft, while the proposed injection interval will be in the Lower Bell Canyon Formation, which runs from 4,300 ft to 5,208 ft, and the top of the Cherry Canyon Formation, which runs from 5,208 ft to 5,800 ft. The Protestant has no production in the Lower Bell Canyon Formation and no production from the Cherry Canyon Formation.

The Applicant's expert geologist, Howard McLaughlin, testified that there is a minimum of 50 ft of impermeable shale isolating the top of the proposed injection interval. Page 4 of 4 Swift's Exhibit No. 18 is a log of the type well, the Walsh & Watts 83-1, (API No. 42-301-31326) which clearly shows the shale layers. Page 18 of Fulcrums Exhibit No. 18, is a four well cross section clearly delineating the confining shale barriers. 4 Swift's professional engineer, Larry Carlisle, P. E. testified that "at approximately 4,270 ft there is permeability layer that separates the sand in the uppermost Bell Canyon Formation from the top of the 4,400 ft proposed injection interval. Towards the lower part of the section (4,360 to 4,400) we have a 40 ft permeability layer of shale. We have shale; very little if any permeability or porosity.⁸ Below the base of the injection interval at 5,800 ft there is over 100 ft of shale which will prevent the injection fluids from escaping below the injection zone.

⁸ T. 81:4-25

There are no wells within the quarter-mile or one half-mile area of review of the proposed well completed in the injection interval. All gas production within one mile of the proposed well is below 18,000 ft, in the Ellenburger Formation, approximately 12,000 ft below the proposed injection zone. The Examiners conclude the Applicant's evidence is sufficient to show that the injected fluids will not endanger or injure any oil, gas, or mineral formation.

PROTECT WATER RESOURCES

The Commission's rules require a one-quarter mile area of review for penetrations into the disposal zone, and one-half mile area of review for serving notice to well operators. Examiners note that there are no completions into the Lower Bell Canyon or the Cherry Canyon Formations within a quarter mile of the proposed injection well. The Applicant has met the requirements regarding the one-quarter mile and one-half mile areas of review.

Fulcrum has demonstrated that, with adequate safeguards, the proposed injection well will not result in pollution of fresh surface or ground water. Surface casing (13- 3/8-inch) will be set to a depth of 800 feet, 50 feet below the BUQW/USDW and cement will be circulated to surface. Intermediate casing (10-3/4-inch) will be set to a depth of 4,400 feet with cement circulated to surface. Long-string casing (7-5/8-inch) will be set to a depth of 5,800 feet with cement circulated to surface. Injection tubing (4.5-inch) will be run inside the long string casing and a packer will be set at a depth of 4,350 feet.

The proposed disposal permit includes standard provisions for commercial surface facilities to protect ground and surface fresh water from pollution. The facility will feature a closed liquid collection system, waste fluids will not be exposed to the atmosphere or ground surface. Tanks and mechanical equipment will be located within a secondary containment structure with sufficient capacity to contain all received fluids on the site at any one time.

The Examiners conclude the evidence of record demonstrates the Applicant's evidence was adequate to show that the freshwater resources are adequately protected from pollution.

FINANCIAL RESPONSIBILITY

Fulcrum Delaware Water Res, LLC, Operator No. 288546, is an active organization. Fulcrum has filed a \$25,000 cash deposit for financial assurance with the Commission. The Examiners conclude that Fulcrum has made a satisfactory showing of financial responsibility as required by Section 27.073 of the Texas Water Code.

FINDINGS OF FACT

1. Pursuant to Statewide Rule 46, Fulcrum Delaware Water Res, LLC (Fulcrum) requests authority to inject commercial fluid into a reservoir productive of oil or gas by utilizing the Chapman SWD Lease, Chapman-2 Well, Hubbard (Cherry Canyon) Field, Loving County, Texas.

2. On January 15, 2015, notice of application was mailed to the Loving County Clerk, the surface owner of the subject disposal tract, the surface owners of adjacent tracts, and the operators of offset wellbores located within a one-half mile radius of the proposed well.
3. Notice of application was published on January 9, 2015 in The Pecos Enterprise, a newspaper of general circulation in Loving County.
4. The proposed well will be located approximately 0.9 miles south of the City of Mentone, in the W.M. Smith Survey, A-466, Loving County, Texas.
5. The application was protested by Mark Bragg owner of Claude-Maggie Co., an offset well operator, whom appeared at the evidentiary hearing.
6. The application is supported by Matador Resources Company ("Matador Resources"), a publicly-traded company with hydrocarbon drilling and production activity in the immediate vicinity. If approved, Matador seeks to utilize disposal services at the proposed well.
7. The applicant has pending disposal contracts with three additional companies.
8. The BUQW and the USDW are from the surface to a depth of 750 feet. The proposed well will be cased and cemented to isolate the BUQW and the USDW from the injection interval.
9. The well will be completed in the following manner:
 - a. The well will be drilled to a depth of 5,800 feet and inject into the Bell Canyon and Cherry Canyon Formations, in an interval from 4,400 feet to 5,800 feet.
 - b. Surface casing (13 3/8-inch) will be set to a depth of 800 feet with cement circulated to surface.
 - c. Intermediate casing (10 3/4-inch) will be set to a depth of 4,400 feet with cement circulated to surface.
 - d. Long-string casing (7 5/8-inch) will be set to a depth of 5,800 feet with cement circulated to surface.
 - e. Injection tubing (4 1/2-inch) will be set with a packer at a depth of 4,350 feet.

- f. The maximum daily injection volume will be 25,000 barrels per day, with an average daily injection volume of 20,000 barrels per day.
 - g. The maximum surface injection pressure will be 2,200 pounds per square inch.
 - h. The proposed well will receive salt water and RCRA-exempt waste for disposal via a pipeline connected to Fulcrum's existing surface facility.
 - i. Surface facilities will comply with standard permit conditions for commercial disposal well facilities, including secondary containment.
10. Oil production within two miles of the proposed injection well is within the Upper Bell Canyon Formation from a depth of 4,200 ft to approximately 4,275 ft
 11. The proposed injection interval will be in the Lower Bell Canyon Formation, which runs from 4,300 ft to 5,208 ft, and the Cherry Canyon Formation, which starts at a depth of 5,208 ft to the bottom of the injection interval at 5,800 ft.
 12. Protestant conducts water flooding operations in a permitted interval from 4,213 ft to 4,275 ft, which is within the Upper Bell Canyon Formation.
 13. Within the one-quarter mile area of review of the proposed well, there are no wells completed in the injection interval.
 14. All gas production within one mile of the proposed well is below 18,000 ft, in the Ellenburger Formation.
 15. Impermeable shale confining units are present immediately above and below the injection interval, effectively isolating the Protestant's water flooding interval from the injection interval of the proposed well and the formations below the injection zone.
 16. There were no seismic events in a radius of 9.08 kilometers around the proposed well.
 17. Fulcrum has an active Form P-5 and a cash deposit of \$25,000 for financial assurance.

CONCLUSIONS OF LAW

1. Resolution of the subject application is a matter committed to the jurisdiction of the Railroad Commission of Texas. Tex. Nat. Res. Code § 81.051
2. All notice requirements have been satisfied. 16 Tex. Admin. Code § 3.46
3. The installation and use of the proposed disposal well is in the public interest.
4. The installation and use of the proposed disposal well will not endanger or injure any oil, gas or other mineral formation. 16 Tex. Admin. Code § 3.46(a)
5. With proper safeguards, both ground and surface fresh water will be adequately protected from pollution. Texas Water Code § 27.051(b)
6. Fulcrum Delaware Water Resources, LLC has made a satisfactory showing of financial responsibility. Texas Water Code § 27.073.
7. Fulcrum Delaware Water Resources, LLC has met its burden of proof and satisfied the requirements of Chapter 27 of the Texas Water Code and the Railroad Commission's Statewide Rule 46.

RECOMMENDATION

Based on the Based on the above findings of fact and conclusions of law, the Examiners recommend that the Commission approve the application, as set out in the attached Final Order.

Respectfully submitted,



Richard Eyster, P.G.
Technical Examiner



John Dodson
Legal Examiner