



RAILROAD COMMISSION OF TEXAS

HEARINGS DIVISION

PROPOSAL FOR DECISION

OIL & GAS DOCKET NO. 08-0300221

THE APPLICATION OF BVX OPERATING, INC. PURSUANT TO STATEWIDE RULE 46 TO INJECT FLUID INTO A RESERVOIR PRODUCTIVE OF OIL OR GAS FOR THE PARRAMORE LEASE, WELL NO. 4701V, GARDEN CITY, S. (WOLFCAMP) FIELD, STERLING COUNTY, TEXAS

HEARD BY: Brian Fancher – Technical Examiner
Jennifer Cook – Administrative Law Judge

PFD PREPARED BY: Paul Dubois – Technical Examiner
Jennifer Cook – Administrative Law Judge

APPEARANCES:

REPRESENTING:

APPLICANT:

Jamie Nielson
William J. Burns
Frank Muser
Mark Hoppe

BVX Operating, Inc.

PROTESTANTS:

Clay Nance
Reed Stewart
Kerry Pollard
Eleanor Bryant
Riggin Stewart
Kathryn LeRuth Stewart
Danny Stewart

Reed Stewart, individually;
Reed Stewart as Trustee of the LeRuth
Reed Stewart 1999 Trust; and
Stewart Land Management, Ltd.

PROCEDURAL HISTORY

Application Published:	February 19, 2016
Application Filed:	March 11, 2016
Protest Received:	March 30, 2016

Request for Hearing:	April 7, 2016
Notice of Hearing:	April 22, 2016
Hearing Held:	June 6, 2016
Transcript Received:	July 15, 2016
Protestants' Closing Statement Received:	August 15, 2016
Applicant's Closing Statement Received:	September 15, 2016
Proposal for Decision Issued:	April 5, 2017

STATEMENT OF THE CASE

Pursuant to Statewide Rule 46 (16 Tex. Admin. Code § 3.46), BVX Operating, Inc. ("BVX") seeks Commission authority to dispose of salt water into a formation productive of oil and gas for the Parramore Lease (No. 45561) Well No. 4701V, in the Garden City, S. (Wolfcamp) Field, Sterling County, Texas. The Parramore Lease Well No. 4701V (API No. 42-431-33388) is an existing shut-in well that BVX seeks to convert to non-commercial disposal service. BVX seeks authority to inject up to 5,000 barrels of salt water per day into the subsurface depth interval from 5,000 feet to 9,100 feet. At the hearing, BVX reduced the requested disposal interval to between 5,000 feet and 8,900 feet. Further, BVX requested that the maximum surface injection pressure be limited based on the results of a step-rate test to be conducted before disposal activities commence.

The application is protested by Reed Stewart (individually), Reed Stewart as Trustee of the LeRuth Reed Stewart 1999 Trust, and Stewart Land Management, Limited (collectively, "The Stewarts"). The Stewarts, owners of adjoining surface tracts and mineral interests, contend that the proposed disposal well will harm their mineral and freshwater resources. BVX moved to deny The Stewarts standing as protestants in this matter.

The Technical Examiner and Administrative Law Judge (collectively, "Examiners") conclude The Stewarts are affected persons entitled to protest the application. Further, the Examiners recommend the application be denied. The applicant has not demonstrated that the proposed disposal well will not endanger or injure any oil, gas, or other mineral formation.

APPLICABLE LAW

The Railroad Commission may grant an application for a disposal well permit under Texas Water Code § 27.051(b) 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. *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.*

Statewide Rule 46(c)(5) states:

- (A) *If a protest from an affected person or local government is made to the commission within 15 days of receipt of the application or of publication, whichever is later, or if the commission or its delegate determines that a hearing is in the public interest, then a hearing will be held on the application after the commission provides notice of hearing to all affected persons, local governments, or other persons, who express an interest, in writing, in the application.*
- (B) *For purposes of this section, "affected person" means 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.*

PART I: THE STATUS OF THE STEWARTS AS AFFECTED PARTIES

Statewide Rule 46 disposal well applications may be approved administratively without need of a hearing if no protest is filed by an affected person.¹ Conversely, if an affected person files a protest, a hearing is required.² BVX filed a motion to dismiss The Stewarts as parties to this case claiming The Stewarts are not affected persons as that term is used in Statewide Rule 46. Since The Stewarts are the only protestants, if they are dismissed the application at issue may be approved administratively, without need of a hearing. The Examiners deferred ruling on the issue and conducted a hearing on the merits of the application.

After consideration of the record and arguments of the parties, the Examiners find that The Stewarts have met the burden of establishing that they are affected persons under Rule 46. Rule 46 defines an affected person as follows:

For purposes of this section, "affected person" means 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.³

¹ 16 TEX. ADMIN. CODE § 3.46(c)(6).

² 16 TEX. ADMIN. CODE § 3.46(c)(5)(A).

³ 16 TEX. ADMIN. CODE § 3.46(c)(5)(B).

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 are specifically identified as affected persons; The Stewarts do not fall within either category. Thus, to be affected persons they need to show they will suffer actual injury or economic damage other than as a member of the general public or as a competitor. They need not show they will prevail on the merits but do need to provide a showing regarding the potential for an injury to their interest that is distinguishable from any claim of harm that may lie with the general public.⁴

The Stewarts own mineral and surface interests in approximately 33,000 acres of land (the "Stewart Ranch") near the proposed well location, including undivided surface and mineral interests in three tracts of land adjacent to the tract where the well is located. The proposed disposal well is approximately 3,000 feet from The Stewarts' closest property line. The Stewarts have been ranchers in this area since approximately 1889 and for five generations, including Mr. Reed Stewart's children. Over time they have accumulated the acreage comprising the Stewart Ranch.⁵ The Stewart family lives on the Stewart Ranch. They operate a commercial cow-calf operation, including a professional bull raising operation. The main headquarters of their operation and Mr. Stewart's house is approximately two-and-a-half miles south of the proposed disposal well. They have water wells approximately a mile-and-a-half south of the proposed disposal well; the water wells are used to pipe water to the headquarters for human consumption and for the live stock. The Stewart Ranch is downgradient from the proposed injection well. There are hunting leases on the Stewart Ranch and the Stewart Ranch participates in the Texas Parks and Wildlife's Managed Lands Deer Program at Level 3, which is the highest level of participation. The Stewart Ranch also donates youth hunts to the Texas Wildlife Association of the Texas Youth Hunting Program. Per Mr. Stewart, the livelihood of several members of the Stewart family is dependent on the viability of the Stewart Ranch. Additionally, The Stewarts have productive gas and oil wells on the Stewart Ranch for which they get royalty payments and mineral interests that they want to protect for future development.

The Stewarts are concerned about the integrity of the proposed disposal well and potential damage to their mineral interests, groundwater, surface water and land. Because the proposed disposal well is uphill, if there are surface spills from the well, the Stewarts are concerned about a spill migrating downhill and contaminating the ranch. The Stewarts are also concerned about contaminated groundwater migrating to the water wells the

⁴ See, e.g., *The Application of Texas SWD CO., Inc. Pursuant to Statewide Rule 46 for a Commercial Permit to Inject Fluid into a Reservoir Productive of Oil or Gas, Harrison SWD Lease, Well No. 1, Mertzon (Clear Fork, Lower) Field, Irion County, Texas*, Oil & Gas Docket No. 7C-0293476, (June 17, 2015) (Proposal for Decision, Final Order); *The Application of Johnson Sanford Operating Company to Amend its Permit to Dispose of Oil and Gas Waste by Injection into a Porous Formation Productive of Oil or Gas, Whitt Bains Lease, Well No. 3, Brookshire Field, Waller County, Texas*, Oil & Gas Docket No. 03-0231502, (December 12, 2002) (Proposal for Decision, Final Order); see generally *City of Waco v. Tex. Comm'n on Env'tl. Quality*, 346 S.W.3d 781, 798-827 (Tex. App.—Austin 2011), *rev'd on other grounds*, 413 S.W.3d 409 (Tex. 2013); *Tex. Indus. Traffic League et al. v. R.R. Comm'n of Tex.*, 628 S.W.2d 187, 191-205 (Tex. App.—Austin), *rev'd on other grounds*, 633 S.W.2d 821 (Tex. 1982).

⁵ Tr. 208:14 to 244:24; Stewart Ex. 4-14.

ranch relies on for human and livestock consumption. They are also concerned about the well damaging reservoirs in which they have mineral interests.

The Examiners find The Stewarts have sufficiently demonstrated that they are affected persons—in that they could suffer an injury distinct from the public—entitled to a hearing under Statewide Rule 3.46(c)(5)(A).

PART II: HEARING ON THE MERITS

BVX'S EVIDENCE

Testimony in support of BVX's application was made by Mark Hoppe, the surface owner of the injection tract, Frank Muser, P. E., consulting petroleum engineer, and William Burns, P. E., President of BVX.

Notice and Application

On February 19, 2016, notice of the application was published in the *Sterling Courier*, a newspaper of general circulation in Sterling County, Texas. BVX filed its initial application (Commission Forms H-1 and H-1A) for the subject well on March 11, 2016. On that same day, BVX's consultant mailed copies of the application to the surface owner of the injection well tract, two offset operating companies⁶, and the Sterling County Clerk.⁷ In its initial application, BVX sought Commission authority to convert its existing Parramore Lease Well No. 4701V to non-commercial disposal service with the following permit conditions:⁸

- Injection will be into the Wolfcamp, Cisco, Canyon, Strawn, Mississippian, Fusselman and Montoya Formations in the depth interval from 5,000 feet to 9,100 feet.
- Injected fluids will be limited to salt water at a maximum daily injection volume of 5,000 barrels per day ("bpd"), and an average daily volume of 2,500 bpd.
- The maximum surface injection pressure will be 2,500 pounds per square inch gauge ("psig").

During the course of the hearing, BVX proposed two revisions to those permit conditions:

⁶ Steller Energy & Investment Corp., and Foreland Operating, LLC were mailed notice of the application, but neither company operates wells within one-half mile of the proposed disposal well.

⁷ BVX Ex. 7, 13 & 14.

⁸ BVX Ex. 7.

- First, BVX proposes raising the base of the injection interval from 9,100 feet to 7,510 feet, such that the revised injection interval (from 5,000 feet to 7,510 feet) includes only the Wolfcamp and Cisco Formations (or portions thereof).⁹
- Second, BVX requests that the maximum surface injection pressure be established based on the results of a step-rate pressure test after the permit is issued, but before disposal activities commence.¹⁰

In addition, the application indicates that fluids to be disposed of in the Parramore 4701V well will be limited to salt water produced from BVX's Parramore Lease (No. 45561).¹¹

Well Construction and History

Parramore No. 4701V was completed on August 13, 2014, to a total depth of 9,100 feet and plugged back to a depth of 9,035 feet. Surface casing was set to a depth of 2,035 feet and cement was circulated to the surface. Production casing was set at a depth of 9,100 feet. A multi-stage tool at a depth of 5,027 feet was used to cement the production casing.¹² The top of cement was determined to be at a depth of 4,660 feet based on a cement bond log.¹³ Perforations were initially made in the Ellenburger Formation at a depth of about 9,000 feet, but only water was produced. A bridge plug was set in the well at a depth of 8,925 feet and topped with 25 feet of cement.¹⁴

The Parramore 4701V was fracture stimulated in 11 stages in the depth interval from 6,008 feet to 8,888 feet, from the Wolfcamp through the Mississippian Formations. In a 24-hour initial potential test on August 23, 2014, the well produced 132 barrels of oil, 123 thousand cubic feet ("mcf") of gas, and 822 barrels of water, for an 86 percent water cut.¹⁵

In December 2014, BVX isolated the perforated interval to add three uphole perforation and stimulation stages to the well completion. The three added stages were in the Wolfcamp Formation in the depth interval from 5,293 feet to 5,864 feet. The second stage, at a depth of 5,600 feet to 5,606 feet had a surface fracture initiation (break) pressure of 614 psi. In stage one the fracture initiation pressure was 1,727 psi and in stage three it was 3,672 psi.¹⁶ After stimulation, a 24-hour initial potential test of the three

⁹ Tr. 332: 17 to 333: 8.

¹⁰ Tr. 337: 6-23. The Examiners understand this request to mean that the maximum surface injection pressure will not exceed 2,500 psig.

¹¹ BVX Ex. 7. See Form H-1, Item No. 22.

¹² BVX Ex. 9.

¹³ BVX Ex. 10.

¹⁴ Tr. 64: 8-13 and 104: 4-13.

¹⁵ BVX Ex. 9.

¹⁶ Stewart Ex. 3.

upper-most perforations was conducted on December 31, 2014, at which time the well produced no oil, no gas, and 504 barrels of water. BVX attempted cement squeeze operations on the three shallow perforation stages but those operations were unsuccessful. BVX opened the wellbore from 5,293 feet to 8,888 feet for production until July 2015, when the well was shut-in. Prior to shut-in, BVX testified that the well was only able to produce about 3 barrels of oil per day.¹⁷

BVX did not offer evidence for how much oil, gas or water had been produced from Parramore Well No. 4701V while the well was in production from August 2014 until July 2015. There is one other well (No. 7901V) on the Parramore Lease, and a third nearby well (Hoppe Sellers Lease [No. 40346] Well No. 1X). Combined, the Parramore 7901V and Hoppe Sellers 1X wells produced about 11 barrels of oil and 55 barrels of water per day in November 2015.¹⁸

Groundwater and Geologic Considerations

The Commission's Groundwater Advisory Unit ("GAU") indicates the base of usable quality water ("BUQW") occurs at a depth of 325 feet, and the base of underground sources of drinking water ("USDW") occurs at a depth of 375 feet. Both of these horizons are behind the existing surface casing, which was set to a depth of 2,035 feet and cemented to the surface.

The Wolfcamp Formation was encountered in the Parramore 4701V well in the depth interval from 4,324 feet to 7,369 feet, and the Cisco Formation was encountered from 7,369 feet to 8,104 feet. Frank Muser, P.E., BVX's expert engineering witness, stated his opinion that the various fracture stimulation treatments would typically have a height of about 100 to 120 feet, which would tend to propagate upward, and half-lengths (perpendicular to the wellbore) of 200 to 300 feet, which was also confirmed by a post-stimulation analysis.¹⁹ The Wolfcamp itself is low permeability and cannot be produced without hydraulic fracture stimulation.²⁰ Mr. Muser also stated that the seven formations (Wolfcamp, Cisco, Canyon, Strawn, Mississippian, Fusselman and Montoya) identified on the Parramore Lease are probably still productive.²¹ Mr. Muser also asserts that the Wolfcamp Formation will provide a competent upper confinement zone to prevent the upward migration of injected fluids.²² Further, Mr. Muser stated that the revised base of injection interval at 7,510 feet also provides adequate shale confinement to prevent the downward migration of injected fluids.²³

¹⁷ Tr. 107: 18 to 108: 20.

¹⁸ BVX Ex. 20. On Exhibit No. 20 BVX represented that the Hoppe Sellers Well No. 1X was actually on the Parramore Lease. The reason for this representation was not clear.

¹⁹ Tr. 67: 2-24. BVX Ex. 23.

²⁰ Tr. 151: 20-25; Tr. 148: 25 to 149:4.

²¹ Tr. 156: 16 to 157: 20.

²² Tr. 68: 20-24.

²³ Tr. 332: 17-23.

BVX did not identify a particular geologic stratum within the proposed injection interval that would be the primary receiver for injected fluids. Instead, BVX requests that the existing perforations and fracture network throughout the proposed injected interval (5,000 feet to 7,510 feet) be accessible for disposal. In addition, BVX does not know which strata within the existing perforated interval are the source intervals for the water or hydrocarbons that the well has produced.

Well Conversion to Injection Service

BVX proposes to convert the Parramore 4701V well to injection service, limiting the injection interval to the existing perforations between 5,000 feet and 7,510 feet. BVX did not indicate a method of closing or isolating the existing perforations in the wellbore below 7,510 feet (i.e., by setting a bridge plug and cement, performing cement squeezes on the perforations, etc.). Injection tubing (2 7/8-inch) will be set with a packer at a depth of 4,950 feet. William Burns, P.E., President of BVX, stated that the Parramore 4701V well currently takes water on a vacuum.²⁴ That is, additional surface injection pressure is not needed to push fluids into the open formations.

Relatively low fracture initiation pressures (as low as 614 psi) were observed when the shallow Wolfcamp zones were fracture stimulated. Therefore, BVX requested that the maximum surface injection pressure be limited based on the results of a step-rate test to be conducted before disposal activities commence.

Area of Review

There are no wellbores that penetrate the disposal interval within the one-quarter mile area of review around the Parramore 4701V well. There are two permitted locations within a one-half mile radius (API Nos. 42-431-33467 and 42-431-33469). Both of those permits were obtained by BVX in 2014, but have since expired without being drilled.²⁵

The online earthquake archives of the U.S. Geologic Survey do not identify any seismic events with a magnitude greater than 1 within a 9.08 kilometer radius (100 square miles) of the proposed disposal well from January 1, 1973, to March 10, 2016.²⁶

Public Interest

BVX asserts the proposed disposal well is in the public interest because the production of hydrocarbons in Texas is in the public interest. BVX asserts that the proposed disposal well will enable it to continue to economically produce oil and gas from two other wells—the Parramore 7901V and Hoppe Sellers 1X. Without the subject disposal well, which will provide an economical on-lease disposal option, BVX stated that

²⁴ Tr. 93: 22.

²⁵ BVX Ex. 12.

²⁶ BVX Ex. 11.

it would be forced to plug both Parramore wells, the 4701V and the 7901V.²⁷ Currently BVX hauls its produced salt water—about 100 barrels per day from two wells—18 to 20 miles for disposal. BVX estimates that using the Parramore 4701V to dispose of salt water produced from the 7901V and Hoppe Sellers 1X wells will provide costs savings that will allow BVX to produce an additional 30,000 barrels of oil from the two producing wells.²⁸

BVX seeks authority to dispose of up to 5,000 barrels of salt water per day into the Parramore 4701V well, and this maximum injection volume need is based on the potential future development of the lease.²⁹

Financial Assurance

BVX has an active Organization Report (Form P-5, Operator No. 117237), and has filed a \$50,000 letter of credit for financial assurance.³⁰

THE STEWARTS' EVIDENCE

Testimony on behalf of the Stewarts' protest of the application was given by Reed Stewart and Kerry Pollard, P. E., a consulting petroleum engineer.

Testimony of Reed Stewart

The Stewart Ranch consists of about 33,000 acres of contiguous land that is mostly south of the proposed disposal tract.³¹ The Stewarts have operated the ranch for several generations, running livestock and hunting activities. Mr. Stewart identified three concerns with the proposed disposal well. First, Mr. Stewart stated that the disposal tract is up-hill from the Stewart Ranch, and he is concerned that surface spills could flow overland onto the northern edge of the ranch causing harm. The proposed disposal well will have the capacity to contain 3,500 barrels of saltwater, but the permit will allow the daily disposal of up to 5,000 barrels per day. Mr. Stewart stated that potential surface spills would flow down-gradient to the south, toward the Stewart Ranch; the nearby drainage is generally along and parallel to the north boundary of the Stewart Ranch.³²

Second, Mr. Stewart is concerned about the potential for groundwater contamination. The Stewarts have groundwater wells in Section 48, which is adjacent to and south of the disposal well tract, and in Section 230, which is nearby to the southwest

²⁷ Tr. 96: 20-24.

²⁸ Tr. 82: 2-5.

²⁹ Tr. 104: 24-25.

³⁰ BVX Ex. 16.

³¹ Stewart Ex. 4.

³² Tr. 232: 4-13; Stewart Exs. 4 & 12.

(but not adjoining.) Those water wells are used to supply water for livestock and human consumption.³³

Third, Mr. Stewart is concerned that the proposed disposal activities will harm the Stewarts' mineral interests. BVX proposes to inject salt water into productive reservoirs that are continuous onto the Stewart Ranch. The Stewarts' mineral interests in Sections 6 and 230 are leased to Stellar Energy, and their interests in Section 48 are not leased. In Section 230, the Stewarts are the mineral owners on the Cousins Lease. The operator of wells on the Cousins Lease is Stellar Energy, who has recently completed two wells (Cousins Nos. 3 and 4) on the lease. The Stewarts anticipate further development in Section 230.³⁴ Most of the wells on the Stewart Ranch are completed in the Spraberry (Trend Area) Field, which includes the Wolfcamp Formation. In addition, there is production on the Stewart Ranch wells from the Cisco and Fusselman Formations.³⁵

Testimony of Kerry Pollard, P.E.

The Stewarts' expert engineering witness, Kerry Pollard, P.E., provided additional testimony with regard to the potential harm that he asserts the proposed disposal well poses to the Stewarts' mineral interests.

Mr. Pollard stated it is common for operators to drill deep vertical wells that would produce—or downhole commingle production—from multiple formations.³⁶ Further, Mr. Pollard stated that, generally, the oil and gas development near the location of the 4701V well includes gas wells producing from the Cisco Formation to the south, and oil wells producing from the Spraberry (Trend Area) Field to the north and west.³⁷

Mr. Pollard asserts that the Parramore 4701V well is not suitable for disposal for several reasons. The well was completed with at least 14 perforation and stimulation stages through the original disposal interval (5,000 feet to 9,100 feet) which transected about 8 named geologic formations. The revised disposal interval (5,000 feet to 7,510 feet) in the Parramore 4701V well includes 9 perforation/stimulation stages through the Wolfcamp and Cisco Formations. Further, the Wolfcamp is an oil bearing zone, and the Cisco is a gas producing zone. Mr. Pollard stated that these different mineral bearing zones should have been completed and produced differently, and, he noted, that some strata within the proposed disposal interval likely contain only water and no hydrocarbons.³⁸

³³ Tr. 231: 14-25.

³⁴ Tr. 238 to 242.

³⁵ Stewart Ex. 13.

³⁶ Tr. 267: 3-10.

³⁷ Stewart Ex. 22.

³⁸ Tr. 283-284. Stewart Ex. No. 26.

In December 2014 BVX perforated and stimulated the upper three stages in the Wolfcamp Formation, from 5,273 feet to 5,864 feet, but a subsequent test resulted in water production only. BVX attempted several cement squeeze operations to close off those perforated intervals, but these attempts were unsuccessful. Mr. Pollard testified that the addition of three perforation/stimulation stages in December 2014—and subsequent failed attempts to cement squeeze those intervals—harmed the productive capacity of the Parramore 4701V well. The difficulties BVX experienced in the well's cementing operations indicates that the subsurface wellbore environment is more complicated than currently understood, and therefore poses more risk to freshwater strata and hydrocarbon resources.³⁹ Prior to the uphole recompletion, the daily production from the Parramore 4701V was about 17 barrels of oil, 55 barrels of water, and 104 mcf gas. Since the recompletion, however, the well has rarely been able to produce up to 6 barrels of oil per day and frequently produces only water. In July 2015, for 12 days before the well was shut in, the 4701V well produced 3 barrels of oil per day, about 30 barrels of water per day, and no gas.⁴⁰ According to Mr. Pollard, this indicates that hydrocarbons remain in the reservoirs accessed by the Parramore 4701V well, but that the recompletion activities have damaged the well's ability to recover those resources. Use of this wellbore for disposal into multiple intervals would cause further harm to existing hydrocarbon resources on and adjacent to the disposal tract.⁴¹

Mr. Pollard also cited several inaccurate statements in BVX's completion records filed with the Commission. Specifically, the Commission records do not reflect, the lower-most perforations in the wellbore below the bridge plug at 8,900 feet, or that the correct top of cement behind the production casing is at 4,660 as confirmed by cement bond log, and not 2,702 feet as reported on the two Form W-2s submitted by BVX.⁴²

EXAMINERS' ANALYSIS

The Examiners conclude BVX has not met its burden of proof pursuant to Statewide Rule 46 and Chapter 27 of the Texas Water Code. The Examiners reach this conclusion primarily from evidence that injection into the productive reservoirs accessed by the Parramore 4701V well will harm oil- or gas-bearing formations on the Parramore Lease and, possibly, on adjacent leases including those owned by the Stewarts. Further, while BVX's testimony and evidence indicates that the proposed disposal well may be in its own individual and private business interest, it fails to demonstrate the well is in the public interest. Thus, the Examiners conclude that BVX has not demonstrated the well meets the requirements of Texas Water Code §27.051(b)(i) and (ii); the Examiners recommend BVX's application be denied. A discussion of the evidence and the four required elements of Texas Water Code §27.051(b) follows.

³⁹ Tr. 304. Stewart Exs. 28 & 30.

⁴⁰ Stewart Ex. No. 29.

⁴¹ Tr. 307-308.

⁴² Stewart Ex. No. 28.

The use or installation of the injection well may endanger or injure any oil, gas, or other mineral formation;

In Texas Water Code §27.051(b)(ii), the Commission is charged by the Legislature to protect “*any oil, gas, or other mineral formation*” (emphasis added). That is, the object of protection is the hydrocarbon-bearing reservoir itself, and that injection activities cannot be permitted when the hydrocarbon-bearing reservoir may be endangered or injured. The evidence in the record of this case indicates that the BVX’s completion and recompletion activities on the Parramore 4701V well have likely already injured the productivity of the reservoir, and that injection into the reservoir will further that harm.

The Parramore 4701V well had a short producing life of less than one year. The 11-stage stimulation from 6,008 feet to 8,888 feet demonstrated an initial potential of 132 barrels of oil, 123 mcf gas, and 822 barrels of water per day on August 23, 2014.⁴³ In August 2014 the well averaged 85 barrels of oil, and 912 barrels of water per day for 18 days of production. The completion, recompletion, and productive history of the Parramore 4701V well is summarized in the Table 1.

Before the December 2014 recompletion, the Parramore 4701V well produced 16 or more barrels of oil per day. After the recompletion, the well struggled to produce 3 barrels of oil per day, and on most days the well produced no oil. The recompletion was also followed by significantly increased water production and significantly decreased gas production. In a January 2015 attempt to stem the increased flow of water into the well, BVX attempted cement squeeze operations on the three uppermost perforation stages. These attempts were not successful. In addition, fracture stimulation pressure measurements indicate relatively low fracture pressures (as low as 614 psi at the surface) were experienced in the December 2014 recompletion. Cement-induced fracturing may have contributed to the failure to get a positive outcome in the cement squeeze operations.

BVX testified that downhole commingling of multiple zones in vertical wells is a common practice in the Permian Basin. Nonetheless, such practices do run the risk of one zone interfering with the productive potential of another. Further, BVX testified that it was not certain which of the stimulated zones were productive of water, gas or oil. The Stewarts, who own mineral interests on adjoining properties, contend that saltwater flowing into the wellbore could flood out oil-producing oil zones—and authorizing injection activities worsens that concern. The Examiners agree that such a scenario is readily compatible with the completion, recompletion and production history of the Parramore 4701V well and the reservoirs accessed by the well.

⁴³ BVX Ex. 9.

TABLE 1

Average Daily Production

Month	Days of production	Oil (bbl)	Water (bbl)	Gas (mcf)
<i>11 stimulation stages from 6,008 feet to 8,888 feet</i>				
August 2014	18	85	912	100
September 2014	20	31	206	57
October 2014	30	27	132	114
November 2014	28	17	73	85
December 1-8, 2014	8	16	58	110
<i>3 stimulation stages added in the Wolfcamp from 5,293 feet to 5,864 feet</i>				
December 19-31, 2014	13	0	546	0
January 2015	6	0	522	0
<i>Unsuccessful attempts to squeeze 3 stimulation stages in the Wolfcamp from 5,293 feet to 5,864 feet.</i>				
February 2015	14	0	273	0
March 2015	23	0	220	0
April 2015	25	2	105	0
May 2015	19	3	28	0
June 2015	24	1	147	0
July 2015	12	3	31	0

Therefore, the Examiners cannot conclude that the use or installation of the injection well will not endanger or injure any oil, gas, or other mineral formation, as required by to Texas Water Code § 27.051(b)(ii).

The use or installation of the injection well is not in the public interest;

The term “public interest” is not defined in either the Texas Water Code nor Statewide Rule 46, although the Texas Water Code repeatedly refers to the policies of the State that protect “the public interest.” The Railroad Commission is the agency charged by the Legislature to regulate the production of oil and gas in the State of Texas, and the Texas Supreme Court has held that the Commission’s application of the term “public interest,” as used in §27.051(b)(1) of the Texas Water Code, was appropriately limited to matters related to oil and gas production, and did not include subsidiary issues like traffic safety or air pollution.

The Parramore 4701V well is an existing wellbore that is available to meet BVX’s current saltwater disposal needs of about 100 barrels per day, and BVX has general but unspecified plans for future development. BVX argues that the proposed disposal authority is in the public interest because the permit will provide BVX with cost savings that will allow

it to produce an additional 30,000 barrels of oil from two other nearby producing wells, the Parramore 7901V and the Hoppe-Sellers 1X. But BVX did not consider the cost in lost resources—to itself or adjoining operators and mineral interest owners—of flooding out existing hydrocarbons that are present in the reservoirs accessed by the 4701V well.

In this case, the Examiners are not persuaded by BVX's argument. Specifically, the evidence shows that injection will harm hydrocarbon resources. Therefore the Examiners cannot conclude that the disposal application is in the public interest as required by Texas Water Code § 27.073 as required by Texas Water Code § 27.051(b)(i).

With proper safeguards, both ground and surface fresh water can be adequately protected from pollution; and

The BUQW occurs at a depth of 325 feet, and the base of USDW occurs at a depth of 375 feet. Both of these horizons are behind the existing surface casing, which was set to a depth of 2,035 feet and cemented to the surface. The evidence in the record indicates that there is adequate geologic confinement between the injection interval and the BUQW. Further, there are no wellbore penetrations into the disposal interval within one-half mile of the proposed disposal well.

The Stewarts are concerned about the potential for pollution of its groundwater resources and the potential for damage from surface saltwater spills. In light of BVX's evidence regarding the casing and cementing details of the wellbore, the Stewarts did not identify a pathway for the harm to groundwater resources.

The evidence in the record demonstrates that, if the Commission were to recommend a permit be issued, the permit can be written with with proper safeguards such that both ground and surface fresh water can be adequately protected from pollution as required by Texas Water Code § 27.051(b)(iii).

The applicant has made a satisfactory showing of financial responsibility as required by Section 27.073.

BVX has an active Organization Report (Form P-5, Operator No. 117237), and has filed a \$50,000 letter of credit for financial assurance. The Stewarts presented no testimony or evidence with regard to BVX's ability to meet its financial assurance obligations. The evidence in the record demonstrates the applicant has made a satisfactory showing of financial responsibility as required by Texas Water Code § 27.073 pursuant to Texas Water Code § 27.051(b)(iv).

FINDINGS OF FACT

1. Notice of the application was published in the *Sterling Courier*, a newspaper of general circulation in Sterling County, Texas, on February 19, 2016. On February 19, 2016, BVX Operating, Inc. notified the owner of the surface tract, the Sterling County Clerk, and two nearby operators of wells of the proposed disposal well of

the application. There are no operators of wells within one-half mile of the proposed disposal well.

2. The Commission received protests to the application from Reed Stewart, individually; Reed Stewart as Trustee of the LeRuth Reed Stewart 1999 Trust; and Stewart Land Management, Ltd., who are all affected persons. They have mineral interests and surface interests in land near the proposed well and provided evidence that they could suffer an injury distinct from the general public if the proposed well were permitted.
3. The Notice of Hearing was sent by mail to to all affected persons, local governments, or other persons, who expressed an interest, in writing, in the application.
4. BVX Operating, Inc. and the protestants appeared at the hearing.
5. The Parramore 4701V well was completed in August 2014 at a depth of 9,100 feet.
 - a. Surface casing was set to a depth of 2,035 feet and cemented to the surface, isolating the BUQW and USDW at 325 feet and 375 feet, respectively.
 - b. Production casing was set to a depth of 9,100 feet and cemented with a multi-stage tool to a depth of 4,660 feet as confirmed by a cement bond log.
 - c. The well was initially completed in 11 perforation and hydraulic fracture stimulation stages from 6,008 feet to 8,888 feet.
 - d. In August 2014, a 24-hour initial potential test produced 132 barrels of oil, 123 mcf of gas, and 822 barrels of water,
 - e. By November to early December 2014 the well's production had declined to 16 barrels of oil, 110 mcf of gas, and 58 barrels of water per day.
6. After an attempted recompletion in December 2014, the well exhibited a significantly reduced capability to produce oil and gas.
 - a. In December 2014 three completion stages were added from 5,293 feet to 5,864 feet.
 - b. During recompletion, the surface fracture initiation (break) pressures for the three stages were 1,727 psi, 614 psi, and 3,672 psi in stages 1, 2 and 3, respectively.
 - c. A 24-hour intitial potential test produced no oil, no gas, and 504 barrels of water, and the well produced no additional oil until April 2015.

7. In January 2015 BVX Operating, Inc. unsuccessfully attempted cement squeeze operations to close the three stages that it added in December 2014.
8. For the first 12 days of July 2015 the well's daily production averaged 3 barrels of oil, 30 barrels of water and no gas, and the well was shut-in.
9. Recoverable hydrocarbon resources remain in the reservoirs accessed by the Parramore 4701V well.
10. BVX Operating, Inc. does not know which of the 14 completed reservoir intervals are productive of the oil or water produced thus far from the well.
11. The recompletion and subsequent remedial activities have harmed the reservoir intervals resulting in decreased hydrocarbon production.
12. BVX Operating, Inc. proposes to recomplete the existing Parramore Lease Well No. 4701V, to non-commercial disposal service.
13. Use of the wellbore for injection service will continue to harm the productive capability of the reservoir.
14. The use or installation of the injection well is not in the public interest.
15. The use or installation of the injection well may endanger or injure any oil, gas, or other mineral formation.
16. With proper safeguards, both ground and surface fresh water can be adequately protected from pollution.
17. The applicant has made a satisfactory showing of financial responsibility as required by Section 27.073. BVX Operating, Inc. has an active Organization Report (Form P-5, Operator No. 117237) and has filed a \$50,000 letter of credit for financial assurance.

CONCLUSIONS OF LAW

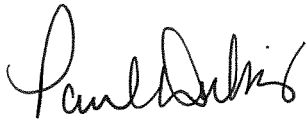
1. Resolution of the subject application is a matter committed to the jurisdiction of the Railroad Commission of Texas. Tex. Nat. Res. Code § 81.051.
2. All notice requirements have been satisfied. 16 Tex. Admin. Code § 3.46.
3. Reed Stewart, individually; Reed Stewart as Trustee of the LeRuth Reed Stewart 1999 Trust; and Stewart Land Management, Ltd. are affected persons under Statewide Rule 46. 16 Tex. Admin. Code § 3.46(c)(5)(A) and (B).

4. The use or installation of the proposed disposal well is not in the public interest. Texas Water Code § 27.051(b)(1).
5. The use or installation of the proposed disposal wells may endanger or injure any oil, gas, or other mineral formation. Texas Water Code § 27.051(b)(2).
6. With proper safeguards, both ground and surface fresh water can be adequately protected from pollution. Texas Water Code § 27.051(b)(3).
7. BVX Operating, Inc. has made a satisfactory showing of financial responsibility. Texas Water Code § 27.051(b)(4).
8. BVX Operating, Inc. has not met its burden of proof and its application does not satisfy the requirements of Chapter 27 of the Texas Water Code and the Railroad Commission's Statewide Rule 46.

EXAMINERS' RECOMMENDATION

Based on the above findings of fact and conclusions of law, the Examiners recommend the Commission enter an order **DENYING** the application of BVX Operating, Inc. for a non-commercial permit to dispose of salt water by injection into the Wolfcamp and Cisco Formations, some of which are reservoirs productive of oil or gas, for the Parramore Lease, Well No. 4701V, in the Garden City, S. (Wolfcamp) Field, Sterling County, Texas.

Respectfully,



Paul Dubois
Technical Examiner



Jennifer Cook
Administrative Law Judge