



RAILROAD COMMISSION OF TEXAS

HEARINGS DIVISION

OIL & GAS DOCKET NO. 7C-0284470

THE APPLICATION OF MICHAEL R. FEELER PURSUANT TO STATEWIDE RULE 9 FOR A COMMERCIAL PERMIT TO DISPOSE OF OIL AND GAS WASTE BY INJECTION INTO A POROUS FORMATION NOT PRODUCTIVE OF OIL OR GAS, GERONIMO SWD LEASE, WELL NO. 2, JOHN SCOTT (GRAYBURG) FIELD, REAGAN COUNTY, TEXAS.

HEARD BY: Richard Atkins, P.E. – Technical Examiner
Marshall Enquist – Hearings Examiner

PFD WRITTEN BY: Paul Dubois – Technical Examiner

APPEARANCES:

APPLICANT:

George Neale
Rick Johnston
Michael Feeler
Tony Smith
Terry Jones
Ken Greer
Alan Garner

REPRESENTING:

Michael Feeler

PROTESTANTS:

Glenn Johnson
Holly Vandrovec
Thomas Richter
Gary Pilsitz
David Triana
Judge Larry Isom
Linda Rees
Kyle Rockwell
Ann Schneeman

Reagan Hospital District

Alicia Ringuet

Jimmy Martin, Inc.

PROCEDURAL HISTORY

Application Filed:	March 8, 2013
Protest Received:	April 22, 2013
Request for Hearing:	May 14, 2013
Notice of Hearing:	October 7, 2013
Date of Hearing:	December 12, 2013, February 5 & 6, 2014
Transcript Received:	February 27, 2014
Proposal For Decision Issued:	May 29, 2014

EXAMINERS' REPORT AND PROPOSAL FOR DECISION**STATEMENT OF THE CASE**

This is the application of Michael R. Feeler (Feeler)(Operator P-5 No. 264547) for a commercial permit to dispose of oil and gas waste by injection into a porous formation not productive of oil or gas for the Geronimo SWD Lease, Well No. 2, in Reagan County, Texas. The proposed disposal well will inject fluids into the San Andres Formation and will be administratively assigned to the John Scott (Grayburg) Field.

Notice of the application was given to adjacent surface owners and all operators within a one-half mile radius of the proposed well, and the Reagan County Clerk in Big Lake. Notice of the application was published in the Big Lake Wildcat, a newspaper of general circulation in Reagan County, Texas, on March 28, 2013. The application is protested by the Reagan County Hospital District, which is an adjoining land owner, and Jimmy Martin, Inc., an oil well operator in the area.

The examiners recommend the application be denied because the Applicant has not proven that the use or installation of the injection well will not endanger or injure any oil, gas, or other mineral formation.

DISCUSSION OF THE EVIDENCE**Applicant's Evidence**

Feeler proposes to drill a new commercial disposal well on its 4.2 acre tract in

Big Lake, Texas. The well would be used to dispose of salt water and RCRA¹ exempt waste generated at oil and gas exploration and production sites and trucked to the proposed facility. Feeler asserts and provided evidence that there is a need for additional disposal capacity in the area and that the construction and operation of the disposal well will meet the requirements of Chapter 27 of the Texas Water Code and the Commission's Statewide Rule 9.

Feeler's initial application was received by the Commission on April 9, 2013. On that date the application Form W-14 was also sent to adjoining surface owners, including the Pembroke Ranch Company, and nearby operators including Jimmy Martin, Inc. Reagan Hospital District was not yet an adjacent surface owner. At the hearing, Feeler's expert engineering witness, Mr. Rick Johnston, P.E., identified several proposed changes to the Form W-14, altering certain technical specifications for the well, including lowering the top of the injection interval, lowering the tubing packer setting, increasing the maximum injection pressure, and decreasing the maximum daily injection volume. The well construction details are as follows:

- The proposed well will be drilled to a depth of 3,700 feet. A drilling permit has been issued for the proposed well and it has been assigned API number 42-383-38439.
- 9 5/8-inch surface casing will be set to a depth of 800 feet and cemented to the surface with 400 bags of cement.
- 7-inch long-string casing will be set to a depth of 2,950 feet, and cemented to a depth of 600 feet below ground surface with 500 bags of cement; the original W-14 set the long string casing at a depth of 2,800 feet.
- 3 1/2-inch tubing will be set with a packer at 2,850 feet.
- The open hole injection interval will be in the San Andres Formation from a depth of 2,950 feet to 3,700 feet; the original application indicated an open hole injection interval from 2,800 feet to 3,700 feet.
- The maximum daily injection volume will be 12,500 barrels per day (bpd), which was reduced from the original application volume of 20,000 bpd.
- The average daily injection volume will be 7,000 bpd.

¹ Resource Conservation and Recovery Act: Examples of RCRA exempt oil and gas waste includes produced water, drilling fluids, frac flowback fluids, rigwash and workover wastes.

- The maximum surface injection pressure will be 1,450 psig; the original application indicated a surface injection pressure of 1,400 psig.
- The average surface injection pressure will be 700 psig.

The Commission's Groundwater Advisory Unit (GAU) has indicated that the interval from the land surface to a depth of 700 feet, representing the base of usable-quality groundwater (BUQW), must be protected. The base of underground sources of drinking water (USDW) is estimated to occur at a depth of 1,075 feet. Further, the GAU has issued a 'no harm' letter stating that the proposed well disposing of oil and gas waste into the (initial application) depth interval from 2,800 feet to 3,700 feet will not endanger fresh water in the area. Feeler notes that its proposed well will have surface casing set to 800 feet, covering the BUQW. Additionally, the cement in the long string will be circulated to 600 feet, providing 200 feet of overlap with the surface casing.

Five oil or gas wellbores were identified within a one-quarter mile radius of review around the proposed well location:

- Timber Floyd, Inc., State-Wolters No. 2 was drilled in 1962 to a depth of 2,762 feet in the John Scott (Grayburg) Field. This well was plugged in 1987.
- Jimmy Martin, Inc., Wolters -B- TG No. 4 was drilled in 1964 to a depth of 2,800 feet in the John Scott (Grayburg) Field. This well has been converted to a salt water injection well for secondary recovery; it is currently shut-in.
- Chambers & Kennedy State-Wolters No. 1, a dry hole, was drilled to a depth of 1,270 feet and plugged in 1958.
- Timber Floyd, Inc., State-Wolters no. 1A was drilled in 1958 to a depth of 2,768 feet. It is a producing well completed in the John Scott (Grayburg) Field.
- Jimmy Martin, Inc., Wolters -B- TG No. 3 was drilled in 1964 to a depth of 2,806 feet. It is a producing well completed in the John Scott (Grayburg) Field.

Feeler's expert engineering witness testified that none of these wells penetrated the proposed disposal interval, and the four wellbores completed in the Grayburg Formation were completed in such a manner to protect shallow groundwater. The dry hole was drilled to a depth of 1,270 feet, above the proposed disposal interval. Feeler

also identified two more Grayburg Formation saltwater injection wells for secondary recovery within a one-half mile radius of the proposed well.

Feeler provided testimony and evidence to show that the San Andres Formation was not productive of hydrocarbons in the area. Within a two-mile radius of the proposed disposal well there are several dozen wellbores. Of these, only one well was completed in a San Andres Field. This well, the Basic Energy Services 1 D well was a salt water disposal well located about 1.5 miles southwest of the proposed well location. This well was completed in the Big Lake (San Andres) Field and has been plugged. Feeler identified no other San Andres completions within a two mile radius of the proposed well location. There is, however, a significant San Andres development from about five to 10 miles to the southeast in the Farmer (San Andres) Field and several other San Andres fields.

Most of the oil and gas production in the area of the proposed well is from the John Scott (Grayburg) and other Grayburg Formation fields. The Grayburg Formation directly overlies the San Andres. Reviewing the Grayburg completions within a two-mile radius, Feeler identified about 10 wells with total depths greater than 2,800 feet. Nine of these were no deeper than 2,836 feet. One well was drilled in 1996, to a total depth of 4,312 feet and perforated from 2,474 feet to 4,206 feet², but produced only 3,144 barrels of oil before being plugged in 2002. There is also some production from fields stratigraphically deeper than the San Andres, including the Spraberry, Wolfcamp, Fusselman and Ellenburger Formations. The current development activity in the area is being driven by horizontal wells in the Wolfcamp Formation. Feeler concludes that there is no San Andres production within five miles of the proposed disposal well.

Feeler provided a cross section analysis of five select Grayburg and San Andres well logs in the area³. Feeler's expert engineering witness identified and noted the following:

- Grayburg production in three of the wells occurs in a thin interval of porosity development at a depth of about 2,700 feet.
- Apart from the thin porosity development, the logs indicate the formation

² This well was assigned to the John Scott (Grayburg) Field; it appears to have been completed in both the Grayburg and San Andres Formations.

³ Distances and direction from the proposed Feeler well: University S # 1 is 6,000 feet southwest and penetrates San Andres; State Wolters # 1 is 2,500 feet north and terminates in Grayburg; Wolters B # 6 is 1,200 feet northeast and terminates in Grayburg; Wolters #8-16 is 2,700 feet east and terminates in Grayburg; and TXL # 1 is 11,000 feet southeast and penetrates San Andres.

appears to be a fairly clean limestone and the low neutron porosity curves in two of the five logs indicates the formation is tight and will act as an aquatard inhibiting the vertical flow of fluids.

- A 10- to 20-foot thick shale break at the contact of the Grayburg and San Andres will also limit vertical migration of injected fluids.
- There is a shale lower confining layer at about 3,600 feet.

Feeler does not currently operate disposal wells. Feeler did obtain a permit for its Geronimo No. 1 well in Rankin, Upton County. After obtaining the permit, Mr. Feeler began work on the facility and then sold it to another entity, Angler Energy, which now operates it with Superior Disposal and Range Energy. Feeler still owns the land where the well is located and he receives a royalty on fluids disposed there. Feeler has placed on file a \$12,500 letter of credit to meet the Commission's financial assurance requirements.

Michael Feeler entered into an earnest money contract to purchase four contiguous 1.05 acre tracts (total of 4.2 acres) from Pembroke Ranch Company LLP on December 5, 2012. The Warranty Deed was dated February 13, 2013, and became effective on February 26, 2013. The Warranty Deed conditioned the conveyance on its use for non-residential industrial or commercial purposes only. Feeler also provided a copy of the Gift Deed from Pembroke Ranch Company LLP to the Reagan Hospital District for the adjoining 13.88 acres. The Gift Deed was dated July 18, 2013. The Gift Deed restricted use of the proposed hospital site by (1) prohibiting on-site salt-water disposal, and (2) requiring a healthcare center be built and operated on the property within five years.

Feeler's 4.2 acre tract adjoins several other commercial and non-residential industrial sites, many, if not all, of which are oil field-related enterprises, including several trucking companies, an industrial fresh water supply facility (Oasis Fresh Water, formerly owned by Feeler), Big Lake Electric, T. Hill Construction, and Basic Energy Services, among others. There is also at least one pumping well and an oil tank battery a few hundred feet to the south of the proposed well. The tank battery is a similar distance from the proposed hospital site as the proposed injection well. Mr. Feeler stated that his original intention was to use the 4.2 acres for additional water supply wells and storage, which would include truck access. After acquiring the property his plans changed and he decided to pursue a commercial injection well permit for the site.

The proposed disposal facility is located in an industrial/commercial area several hundred feet west of State Highway 137, about one mile north of the center of Big Lake. The ground surface slopes gently down to the north. The facility will included a paved access road off of North California Street on the west side of the site. There will be a

concrete unloading station with a sump and associated piping to receive the waste fluids. Trucks will exit the facility to the north, along Doris Way, and head west back to Highway 137. The site plan should prevent traffic on Doris Way between the Feeler and Reagan Hospital District tracts.

The disposal well tank battery facilities will be located within a secondary containment structure consisting of a prepared foundation with a geotextile and a 30-inch steel retaining wall. A spray-application polymer barrier will be applied to seal the structure. The tankage will be placed on poly disks to eliminate ground contact and reduce corrosion potential.

There are 18 active commercial disposal wells within a 10-mile radius of the proposed well. In addition, there are about 1,475 producing wells within this same area with an aggregate monthly production of about 350,000 barrels of oil per month. In 2010 the average aggregate monthly production in this area was about 75,000 barrels per month. The increase is attributable primarily to recent horizontal well completions. Much of the horizontal activity is to the north and west of the proposed location. At the time of the hearing there were about 19 active drilling rigs in Reagan County, mostly north and west of Big Lake. Feeler has not conducted a study to evaluate the amount of produced water and available disposal capacity. Feeler's expert engineering witness asserted such a study would be meaningless, especially because the State of Texas does not require water production from an oil or gas well to be reported and because permitted disposal capacities often vary significantly from a well's mechanical ability to inject fluid into the receiving formation.

Mr. Terry Jones, Mayor of Big Lake and a contract pumper in the area expressed support for the application in his capacity as an oilfield service provider. Mr. Jones stated that a commercial disposal well at Feeler's proposed location on the north side of town would be a benefit by reducing wait times and by relieving heavy truck traffic through town. As Mayor, he stated that he was not concerned about the close proximity of the hospital to the proposed disposal well.

Mr. Tony Smith, an employee-owner of Superior Disposal and related firms testified there was a continued need for increased disposal capacity in the area. Mr. Smith will likely be a technical advisory resource for Mr. Feeler in running the disposal facility, and possibly responsible for its operation. Mr. Smith stated that in this position he would determine what fluids were accepted for disposal, but that measurement (or analysis) of the fluid would not be a part of that acceptance. Mr. Smith also stated that additional disposal capacity would result in shortened wait times and better overall economics for the operators and haulers.

Mr. Allen Garner, Fire Chief for Big Lake, testified on behalf of Feeler. Mr. Garner testified that he did not believe the proposed disposal well facility or the nearby

oil tank battery poses a danger to the proposed hospital. He stated that in 1992 or 1993 the nearby oil tank battery was struck by lightning and caught fire. The fire department quickly responded and extinguished the fire, and evacuation of nearby homes was not necessary or undertaken. Mr. Garner stated that these facilities are close enough to town that there would be a very quick response to any emergency situation; he did not believe evacuating the hospital facilities would be necessary. He also testified that the fire department, EMS and hospital staff would likely not be able to evacuate the hospital; sheltering-in-place would be a more prudent and viable alternative.

Protestants' Evidence

The application was protested at the hearing by the Reagan Hospital District, which is now an adjacent surface owner, and Jimmy Martin, Inc., an operator of oil wells in the area.

Reagan Hospital District

The Reagan Hospital District asserts the Feeler well is not in the public interest because it conflicts with the public interests presented by the proposed hospital facility and because there is no need for additional disposal capacity in the Big Lake area. The District also claims the proposed well will harm oil and gas production in the John Scott (Grayburg) Field.

The Reagan Hospital District was established in 1977 by an act of the Texas Legislature. Ms. Linda Rees, Board Chair for the Hospital District and County Librarian, testified that in late 2011 to early 2012 the District conducted an engineering study to address its hospital needs. This study concluded that it was not feasible to renovate the existing hospital, which was built in 1949, due to significant mechanical and structural limitations. A second alternative was the redevelopment on the current hospital site, which was not acceptable to the people of Big Lake as it would require closing part of N. Main Street. The District explored acquiring other sites, but determined the available land was too expensive. On cross examination, Ms. Rees confirmed that the Legislature granted the Hospital District the power of eminent domain, but the District has thus far chosen not to exercise it.

In November 2012, the Pembroke Ranch Company publicly offered to donate 13.88 acres⁴ of land to the District for the express purpose of building and maintaining a healthcare facility. The 13.88 acre tract was formally transferred by gift deed on July 18, 2013, and is a part of the same commercial/industrial development in which Feeler's property is located; the Feeler and hospital tracts are adjacent to one another.

⁴ The tract gifted to the Hospital District abuts the Feeler tract.

Current design plans for the healthcare facility place the Feeler tract about 401 feet from the nearest corner of the proposed hospital building care facility; the disposal well will be about 713 feet from the hospital building.

The District was informed by its financial advisor that a permitted disposal well would be considered a 'nuisance' that will need to be disclosed in various bond financing application documentation, and such disclosure may have a negative impact on hospital financing outcomes. Specifically, the injection well may introduce an element of risk causing potential investors to avoid purchasing bonds to be sold to finance the hospital, or that potential investors will desire a higher interest rate on those bonds. Either situation will negatively impact the District's ability to fulfill its legislative mandate to care for the needy inhabitants of Reagan County; the District could respond by cutting healthcare services or generating offsetting income through taxes or fees. The District did not attempt to quantify or estimate these potential impacts.

The District is also concerned that the proximity of the disposal well facility to the proposed hospital could present a safety threat; contingency plans would have to be crafted for potential emergencies, such as a lightning strike, fire or explosion at the disposal well tank battery. There is also an existing oil tank battery, about the same distance from the hospital as the proposed Feeler well, for which the District would also have to form contingency and response plans.

Reagan Hospital District's expert engineering witness was Mr. Thomas H. Richter, P.E.. Mr. Richter testified to his analysis of the disposal capacity needs for the subject area, as well as his interpretation of site-specific geology and fluid confinement concerns. Mr. Richter concludes there is no need for another commercial saltwater disposal well, particularly at the Feeler site. Mr. Richter conducted a study assessing the need and availability of disposal capacity in the area.

There are 46 permitted commercial disposal wells in Reagan County and immediately adjacent Crockett County⁵. These 46 wells give a county-wide density of 25.6 sq. mi. per permitted commercial disposal well. These wells are distributed across the county, with a greater density in the Big Lake area and along Highway 67 east of Big Lake. Most of these wells inject into the San Andres; other injection intervals include the Grayburg, Clear Fork, Spraberry and Ellenburger Formations.

Within a 10-mile radius of the Feeler site there are 22 permitted commercial disposal wells (a density of 14.2 sq. mi.). Within a 5 mile radius of the Feeler site there are 12 permitted commercial disposal wells (a density of 6.5 sq. mi.). Mr. Richter

⁵ This is the number of permitted wells, not actively operational wells. This number also includes one well just inside of Crockett County, less than 10 miles south of Big Lake.

testified that this is the highest density of injection wells he has seen. According to a review of the active injection records, any of these individual wells may be injecting from one to about 90 percent of the permitted daily maximum volume, which may range from 820 to 35,000 bpd. In aggregate, the actual disposal volumes into all of these wells range between 18 and 25 percent of their permitted capacity. Actual disposal volumes into these wells that are active (that is, have reported injection on Forms H-10 or P-18) range from about 31 to 38 percent of their permitted capacity.

In addition to commercial disposal wells in Reagan County, Mr. Richter identified a number of the non-commercial injection wells, many of which are used by individual operators for disposal of waste fluids generated at their own wells. Six operators hold 575 drilling permits issued in Reagan County from October 2011 through October 2013 (61.5 percent of all original permits issue during this time.) About 80% of these permits are for the Spraberry (Trend Area) Field. These six operators also maintain a total of 108 saltwater injection wells in Reagan County (most for disposal, some for secondary recovery). Other operators also use their own injection wells. Mr. Richter concludes that a portion of the disposal capacity is met by individual operators through their own infrastructure. Summarizing all of the injection for disposal permits and reported actual volumes injected in the County, Mr. Richter finds that the actual-to-permitted ratio of disposal volumes is 11.1 percent, and thus there is more than sufficient available and permitted capacity to meet the needs of the Reagan County area.

The District is also concerned that the proposed injection well will endanger or injure oil and gas production in the overlying Grayburg Formation. Within a two-mile radius of the proposed Feeler well there are 133 wells, 124 of which are completed in the John Scott (Grayburg) Field. The District's Exhibit No. 38 is a compensated neutron / compensated photo density gamma ray log of the Lone Star Anchor Weatherby No. 1 SWD well⁶ that Feeler submitted as a part of its original W-14 application for the proposed Geronimo No. 2 well. Mr. Richter testified that he does not see a shale confining layer separating the San Andres and Grayburg Formations in the log. The permitted injection interval for this well appears to span across the Grayburg and San Andres Formations, which are lithologically similar. Mr. Richter acknowledge that some of the formation material may act as an aquatard, but he notes that the Grayburg pressure has been depleted, injection into the San Andres will increase pressure in that formation, and a positive pressure gradient will be upwards into the Grayburg.

Jimmy Martin, Inc.

Mr. Michael Fisher, President of Jimmy Martin, Inc. (Martin), an adjacent

⁶ The well is assigned to the John Scott (Grayburg) Field, and the well is permitted under Statewide Rule 46. RRC online GIS system indicates the Weatherby No. 1 well is about 2.9 miles from the proposed Feeler Geronimo No. 2 well.

operator, protests Feeler's application out of concern that the commercial injection facility may endanger or injure its adjacent oil production. Mr. Fisher gave an oral deposition by telephone from Big Lake on December 10, 2013. Counsel for Feeler and Reagan Hospital District participated in the deposition. The written transcript of the deposition (with four attached exhibits) was admitted into evidence at the hearing as Martin Exhibit No. 1.

Martin currently operates 15 wells within a 2-mile radius of the proposed injection well. All of the wells are completed in the John Scott (Grayburg) Field. Eight of these wells are currently producing a total of about 350 BOPM. The remaining seven are waterflood injection wells. The current monthly injection volume is about 3,000 barrels of produced Grayburg Formation and fresh water. Martin's 15 wells are perforated in various intervals within 2,576 feet to 2,766 feet. Individual perforated intervals range in thickness from 4 to 41 feet. Most wells are completed with one perforated interval; two wells have two perforated intervals and one well has three.

Mr. Fisher stated that there is no confining layer or shale between Feeler's proposed injection zone and the Grayburg producing zone. He referred to the Grayburg and the underlying San Andres injection zone as being "the same formation," (Fisher Deposition, Tr p14, 13-18). Mr. Fisher also expressed concern that the proposed commercial injection well will introduce fluids to the formation that may be harmful to current production. Of particular concern were the introduction of scale-forming constituents and barium. While Martin's own waterflood system uses produced Grayburg salt water and fresh water, the proposed commercial injection well would be permitted to dispose of a wider range of fluid constituents, some possibly harmful to Martin's Grayburg production.

Commission Staff

At the hearing on December 12, 2013 and February 5, 2014, Mr. Doug Johnson, the Commission's Assistant Director for Technical Permitting, provided statements about recent events, the current situation, and Commission responses to concerns about excessive injection into the San Andres Formation in Reagan and Upton Counties. The San Angelo District Office raised concerns about possible over-pressurization in the San Andres as a result of the industry's dependence upon it for disposal in the area. Salt water flows were encountered in a number of wells being plugged. In December 2012, Commission Staff suspended processing of San Andres Formation disposal wells in Reagan and Upton Counties, and considered administrative approval for only those facilities that agreed to a permit condition prescribing a regular bottom hole pressure testing regimen.

However, on February 5, 2014, Mr. Johnson provided an update in which he stated Commission staff would not be going forward with additional permit conditions,

testing, or imposing any sort of moratorium on permitting new San Andres injection wells in Reagan County. He did not state that the potential over-pressure situation was resolved; the concern still exists. However, Mr. Johnson did state that the Commission would continue to monitor the situation and any change in policy or regulatory posture on the issue would be made formally at an open meeting of the Commission.

EXAMINERS' OPINION

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. 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 if required by Section 27.073.

It is the examiners' opinion that the application be denied because the Applicant has not proven that the use or installation of the injection well will not endanger or injure any oil, gas, or other mineral formation. The examiners will consider this requirement of Chapter 27 of the Water Code first.

Endanger or Injure Any Oil, Gas, or Other Mineral Formation

The examiners are of the opinion that the Applicant has not proven that the use or installation of the injection well will not endanger or injure any oil, gas, or other mineral formation. Injection well permits require that the injected fluids be confined to the permitted injection interval. The proposed well location is surrounded by active production from the Grayburg Formation, John Scott (Grayburg) Field, which directly overlies the San Andres injection interval. The top of the proposed permitted injection interval is 2,950 feet. The Applicant presented a geologic cross section of five wells (Feeler Exhibit No. 21). The cross section has an inverted U-shape, so that the middle three wells are reasonably close to the proposed well (within about one-half mile to the north and east), but the first and last wells form more distant legs to the southwest and the southeast (Feeler Exhibit No. 18).

The three wells in the center of the cross section were within about a half mile of the proposed injection well. These wells did not penetrate the San Andres Formation, but all three were productive from a thin and apparently continuous porosity development in the middle of the Grayburg formation at a depth of about 2,700 feet. The first and last wells on the cross section were about one mile to the southwest and two miles to the southeast, respectively. These two wells did penetrate the San Andres, but they did not indicate correlative production in the Grayburg. The Applicant identified a 10-foot to 20-foot thick shale layer separating the San Andres from the Grayburg on the outer two (and most distant) well logs. Considering the Applicant's and Protestants' testimony, the examiners interpret the following:

- The possible shale development is not definitive. There is a somewhat shaley gamma ray signature on the TXL # 1 well log (2 miles southeast of the proposed well), but it is much less prominent on the University S # 1 well log, one mile to the southwest. The three logs in the center of the profile were unfortunately not deep enough.
- The log of the Lone Star Anchor Weatherby # 1 SWD (District Exhibit No. 38), 2.9 miles northeast of the proposed location, does not indicate a shale confining layer between the formations at all. Although there are several high gamma ray spikes, it is not clear where these fall within the stratigraphic section. However, a continuous shale separation between the Grayburg and San Andres is not supported.
- The low neutron porosity in the lower Grayburg—that the Applicant suggested functions as an aquatard—is apparent in the State Wolters # 1 well log, but it is less clear, consistent and definite in the other four logs on the cross section.

To know with reasonable certainty whether a confining interval is present at the proposed location, one must drill and log a borehole. Doing so, however, would be at the applicant's risk as the exploration may confirm the presence or absence of sufficient competent geologic strata to confine fluids to the injected interval.

Current field rules for the John Scott (Grayburg) Field were last amended on March 1, 1966 (Special Order No. 7-56,010). These rules describe productive dolomite and sand strata in the formation, and state, in part,

"...the Grayburg Sand immediately underlying the Grayburg Dolomite is also completed for production through several of the wells in this field; that the sand is indicated, by the available core information, to be in communication with the dolomite pay."

Thus the current, albeit older, John Scott (Grayburg) Field rules recognize some degree of vertical communication within the Grayburg formation itself. The original operating rules for the field (Special Order No. 7-47,239, effective October 11, 1961) described the dolomite zone with an average gross thickness of 170 feet and a net thickness of 64 feet, as compared to 40 gross feet and 21 net feet in the sand. As indicated on the Applicant's cross section, the Grayburg is typically about 400 feet thick in the subject area.

There are five active or plugged wellbores within a one-quarter mile radius of the proposed injection well. None of these wellbores penetrates the proposed disposal interval. All five were cased, cemented, and, if applicable, plugged in such a way to prevent the vertical migration of injection fluids into overlying zones.

This application was appropriately filed on a Form W-14 as injection into a zone not productive of oil or gas. The examiners acknowledge that there is some discretion when defining the Grayburg and San Andres Formations in the area and subsequently assigning wells to fields in either formation. However, there is a vertical separation between the top of the San Andres and the identified productive intervals in the Grayburg that could result in the Commission identifying them as separate fields and reservoirs, if both were productive. The Applicant has demonstrated that there is no production from the San Andres within a five mile radius of the proposed well. This does not preclude, however, that the two formations may be hydraulically connected.

The examiners conclude that the applicant has not demonstrated that the proposed injection well will not endanger or injure any oil, gas, or other mineral formation. Specifically, the examiners believe that insufficient evidence was presented at the hearing to establish that the injection interval was isolated from the overlying Grayburg production. There may be confinement, but the Applicant has not demonstrated it convincingly. The cross section wellbore data points are distant, the shaley interval is thin, and confinement has not been demonstrated to be present or consistent at the proposed location. Fluids injected into the San Andres may migrate into the Grayburg and harm the producing interval.

Public Interest

Under the provisions of the Texas Water Code, the Commission cannot approve an injection well unless it finds, "that the use or installation of the injection well is in the public interest." Texas Water Code § 27.051(b)(1). This is a separate, and independent, prerequisite from the required findings that the injection well will not endanger or injure oil or gas formations, that both ground and surface fresh water will be adequately protected, and that the applicant has shown financial responsibility.

It is the examiners' opinion that the proposed injection well is in the public

interest—separate and apart from the potential for injury to mineral formations describe above—as there is a continuing need for fluid disposal options and because the adjacent public interests offered by a proposed hospital and a proposed disposal well do not conflict.

A number of public interest claims have been made in this case, but the question of what, exactly, constitutes public interests for which the Railroad Commission has jurisdiction is not always clear. The Commission, as upheld by the Texas Supreme Court⁷, asserts that its jurisdiction is limited to those public interests that pertain to the exploration and production of oil and gas resources. For example, the Commission does not claim jurisdiction over highway traffic safety issues and the Legislature has not expressly directed the Commission to consider such questions, even though the industry makes use of the State's transportation infrastructure; the Legislature has instead provided for the Texas Department of Transportation.

All parties to this case acknowledge that salt water and other oil and gas waste disposal is in the public interest as it pertains to the oil and gas industry; such disposal is necessary. The parties dispute, specifically, whether or not Feeler's proposed disposal well is in the public interest; whether or not one more permitted commercial disposal well is necessary in the Big Lake area. Feeler and the District have each highlighted a number of contested cases in which the Commission has ruled consistent with the outcomes they seek in this matter. On various occasions the Commission has decided that there is or is not a need for additional disposal capacity in a particular area. Quantifying disposal need and available capacity is fraught with difficulty for reasons elucidated at the hearing. First, operators are not required to report the volume of produced flow-back or connate formation water. Therefore, there is no readily available public source of information on the volume of waste requiring disposal (or re-injection in the case of secondary recovery). That is, there is no reasonably accurate means of quantifying the demand for fluid disposal, except to say that oil and gas wells will require fluid disposal; hydraulic stimulation of horizontal wells requires even more.

Second, a disposal permit issued by the Commission is no guarantee that the permitted capacity will become operational, either because the facility may not be built or the formation may not be able to accept the permitted volume of fluid. Thus, there is no reasonably accurate means of quantifying the supply (available capacity) of fluid disposal. The District identified 45 permitted commercial disposal wells in Reagan County. Feeler identified 18 active commercial disposal wells within a 10-mile radius of its proposed well. Feeler's witnesses testified to a continued need for additional disposal capacity in the area. The District provided an analysis indicating underutilization of existing permitted and active capacity. All of these statements are

⁷ Railroad Commission of Texas v. Texas Citizens for a Safe Future and Clean Water, 336 S.W.3d (Tex. 2011)

true.

The injection well permitting process does not require an analysis of whether or not a formation will be physically able to accept the permitted volume of fluid. Requested permit volumes may be used in the calculation of potential impacts (i.e., pressure front or water front calculations), but these are based on an assumption that the formation will actually take that volume of fluid. In reality, the ability of a well to take a volume of fluid cannot be ascertained until the well is constructed, tested and disposal is attempted. Therefore, because any means of quantitative assessment is structurally limited, the examiners are of the opinion that the best determination of the need of a particular disposal well, within the Commission's established jurisdiction, to provide a specified disposal capacity is the willingness of an entity to risk the investment but with no guarantee that the well will be able to accommodate the intended volume or generate a positive economic outcome.

In its closing statement, the District asks the Commission to consider other competing public interest claims of legislative action, the District, and Feeler.

Mr. Feeler acquired a deed to his 4.2 acre tract before the District was gifted with its 13.88 acre tract. With land ownership comes certain rights and privileges of use, the exercise of which may or may not be of concern to neighbors. The subject tract was restricted for use as non-residential commercial and other tracts in the development are occupied by various trucking and oil field service companies. Feeler's proposed use is consistent with the existing development. While such land use questions are not within Commission jurisdiction, there is a significant degree to which the exploration and production of oil and gas is dependent upon one's willingness to risk investment for various business concerns directly or indirectly related to the production of oil and gas. And, for that matter, it can similarly be argued that it is necessary that the State have cities and towns and schools and hospitals and fire departments and highways... as all of these, and more, are necessary to the long term thriving of an economy and a robust energy sector.

In 1977 the Texas Legislature signaled its intent for the citizens of Reagan County to have an opportunity to provide healthcare infrastructure for their benefit. To accomplish this objective, the Legislature granted the District eminent domain authority and the ability to levy taxes on Reagan County residents to fund such infrastructure. The Legislature has not, however, specifically signaled its intent for the District to build a new hospital on the gifted 13.88 acre tract at this time; doing so would not necessarily preclude permitting a neighboring commercial disposal well, either. Nor has the Legislature provided direction to the Commission regarding categories of other public facilities and interests which should or should not be considered in Commission decision-making.

The District asserts that the proposed injection well may jeopardize hospital financing, causing service reductions or increased taxes. The District did not quantify these potential impacts. The 13.88 acre tract on which the District proposes to develop as a healthcare complex was a gift without cost to the District. The Legislature empowered the District with eminent domain authority, which the District has chosen not to use, as well as the ability to levy taxes. And so, presumably, the District retains other options to fulfil its mandate.

The District asserts that the proposed disposal well poses a physical threat to the future hospital and those being cared for within it. There are certainly risks associated with injection wells, oil tank batteries, and even hospitals. The proposed hospital and disposal well facilities are intended to be built on land set apart for non-residential commercial and industrial purposes. Fires at oil field facilities in and around Reagan County happen, have been documented, and the Big Lake fire chief testified to the fire department's ability to respond to such events. The fire chief repeatedly asserted that he does not believe the proposed disposal well poses a threat to the proposed healthcare facility.

On balance, then, the examiners conclude that the public interests of the District are not harmed and that the general public interest is served Feeler's right and desire to develop his property.

Adequate Protection of Ground and Surface Fresh Water

The examiners are of the opinion that, with proper safeguards, both ground and surface fresh water can be adequately protected from pollution. The Commission's GAU has issued a 'no harm' letter stating that the well in its original application will not endanger fresh water in the area. The Applicant's changes to the injection interval, tubing and pressure do not affect this determination; the interval was deepened and pressure adjusted accordingly. The Applicant's changes to the Form W-14 do not require additional notice or publication.

The well will have 9 5/8-inch surface casing set to a depth of 800 feet and cemented to the surface with 400 bags of cement. The 7-inch long-string casing will be set to a depth of 2,950 feet, and cemented to a depth of 600 feet below ground surface with 500 bags of cement, providing 200 feet of cement overlap between the two casing strings. The 3 1/2-inch tubing will be set with a packer at 2,850 feet.

There are five active or plugged wellbores within a one-quarter mile radius of the proposed injection well. None of these wellbores penetrates the proposed disposal interval. All five were cased, cemented, and, in two cases, plugged in such a way to prevent the vertical migration of injection fluids into overlying zones.

Financial Responsibility

The examiners conclude that Feeler has made a satisfactory showing of financial responsibility as required by Section 27.073 of the Texas Water Code. Feeler has a current approved Form P-5 (Organization Report) and has posted a \$12,500 financial assurance letter of credit.

FINDINGS OF FACT

1. Notice of the subject application was published in the *Big Lake Wildcat*, a newspaper of general circulation in Reagan County, on March 28, 2013.
2. Notice of the application was sent to the Reagan County Clerk, offset operators within ½ mile and to the surface owners of each tract which adjoins the disposal tract on April 9 and 13, 2013.
3. The application was properly filed on Form W-14 under 16 TAC § 3.9. Changes made to the W-14 at the start of the hearing do not require additional notice or publication.
4. Michael R. Feeler purchased a 4.2 acre tract from the Pembroke Ranch Company on February 26, 2013. Pembroke Ranch Company conveyed the property to Feeler with the restriction that it be used for non-residential commercial or industrial uses.
5. Michael R. Feeler proposes to permit a newly-drilled commercial disposal well in the San Andres Formation and assigned to the John Scott (Grayburg) Field. Feeler proposes to construct and operate the well as follows:
 - a. The proposed well will be drilled to a depth of 3,700 feet. A drilling permit has been issued for the proposed well and it has been assigned API number 42-383-38439.
 - b. 9 5/8-inch surface casing will be set to a depth of 800 feet and cemented to the surface with 400 bags of cement.
 - c. 7-inch long-string casing will be set to a depth of 2,950 feet, and cemented to a depth of 600 feet below ground surface with 500 bags of cement;

- d. 3 1/2-inch tubing will be set with a packer at 2,850 feet.
 - e. The open hole injection interval will be in the San Andres Formation from a depth of 2,950 feet to 3,700 feet;
 - f. The maximum daily injection volume will be 12,500 bpd, and the average daily injection volume will be 7,000 bpd.
 - g. The maximum surface injection pressure will be 1,450 psig, and the average surface injection pressure will be 700 psig.
6. There is a market demand for the disposal of produced salt water and liquid oil and gas waste generated in Reagan County.
- a. Ongoing development of various resource plays in Reagan and surrounding counties are generating waste fluids requiring disposal.
 - b. Within a 10-mile radius of the proposed disposal well there are about 1,475 producing wells with an aggregate monthly production of about 350,000 barrels of oil per month. In 2010 the average aggregate monthly production in this area was about 75,000 barrels per month. The increase is primarily attributable to recent horizontal well completions.
 - c. There are 45 permitted commercial disposal wells in Reagan County and there are 18 active commercial disposal wells within a 10-mile radius of the proposed injection well.
7. The Applicant has not proven that injected fluids will be confined to the injection interval, and thus will not endanger or injure oil or gas formations.
- a. The proposed well location is surrounded by active production from the Grayburg Formation, John Scott (Grayburg) Field, which immediately overlies the San Andres injection interval
 - b. A 10 to 20-foot thick shaley zone south of the proposed well is not evident on well logs north of the proposed well.
 - c. The existence of a shale or other confining layer between the two formations has not been established.
 - d. Current field rules for the John Scott (Grayburg) Field indicate vertical communication within the Grayburg Formation.

- e. Pressure injecting fluids into the San Andres will cause a positive pressure gradient upward towards the overlying Grayburg Formation, which has been depleted by production.
 - f. Commission staff has identified concerns with the over-reliance on the San Andres Formation for disposal in Reagan County, resulting in some over-pressure situations. This general concern has not been specifically tied to the location of the proposed Feeler well.
 - g. There is a shale lower confining layer at about 3,600 feet.
8. The Texas Legislature established the Reagan Hospital District in 1977 to provide for the healthcare needs of the citizens of Reagan County.
- a. The Legislature empowered the District with eminent domain and taxation authority to fund and provide healthcare infrastructure.
 - b. The existing Reagan County Hospital, built in 1949, is at the end of its useful life and needs to be replaced.
 - c. On July 18, 2013 the Pembroke Ranch Company gifted a 13.88 acre tract to the District as a location for a healthcare facility.
 - d. The District alleges but has not quantified the potential financial harm that the proposed injection well may cause as a nuisance in regard to bond financing concerns.
 - e. The Big Lake fire chief does not believe the proposed disposal well poses a threat to the proposed hospital.
9. With proper safeguards, both ground and surface fresh water can be adequately protected from pollution.
- a. The well will be cased and cemented through the BUQW to the surface, and the surface and long-string casing will include 200 feet of cement overlap.
 - b. There are five active or plugged wellbores within a one-quarter mile radius of the proposed injection well. None of these wellbores penetrates the proposed disposal interval. All five were cased, cemented, and, if applicable, plugged in such a way to prevent the vertical migration of injection fluids into overlying zones.

10. Michael R. Feeler has a current approved Form P-5 (Organization Report) and has posted a \$12,500 financial assurance letter of credit.

CONCLUSIONS OF LAW

1. Proper notice was issued in accordance with the applicable statutory and regulatory requirements.
2. All things have occurred to give the Railroad Commission jurisdiction to consider this matter.
3. Michael R. Feeler has not proven that the use or installation of the proposed injection well will not endanger or injure any oil, gas, or other mineral formation.
4. Michael R. Feeler 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 9.

EXAMINERS' RECOMMENDATION

The examiners recommend that Michael R. Feeler's application for its proposed Geronimo SWD No. 2 commercial disposal well be denied because the applicant has not demonstrated that the proposed well will not endanger or injure any oil gas or other mineral formation.

Respectfully Submitted,



Paul Dubois
Technical Examiner



Marshall Enquist
Hearing Examiner

Geronimo # 2
(API # 42-383-38439)
Feeler, Michael R.
Reagan County, Texas

Proposed Disposal Configuration

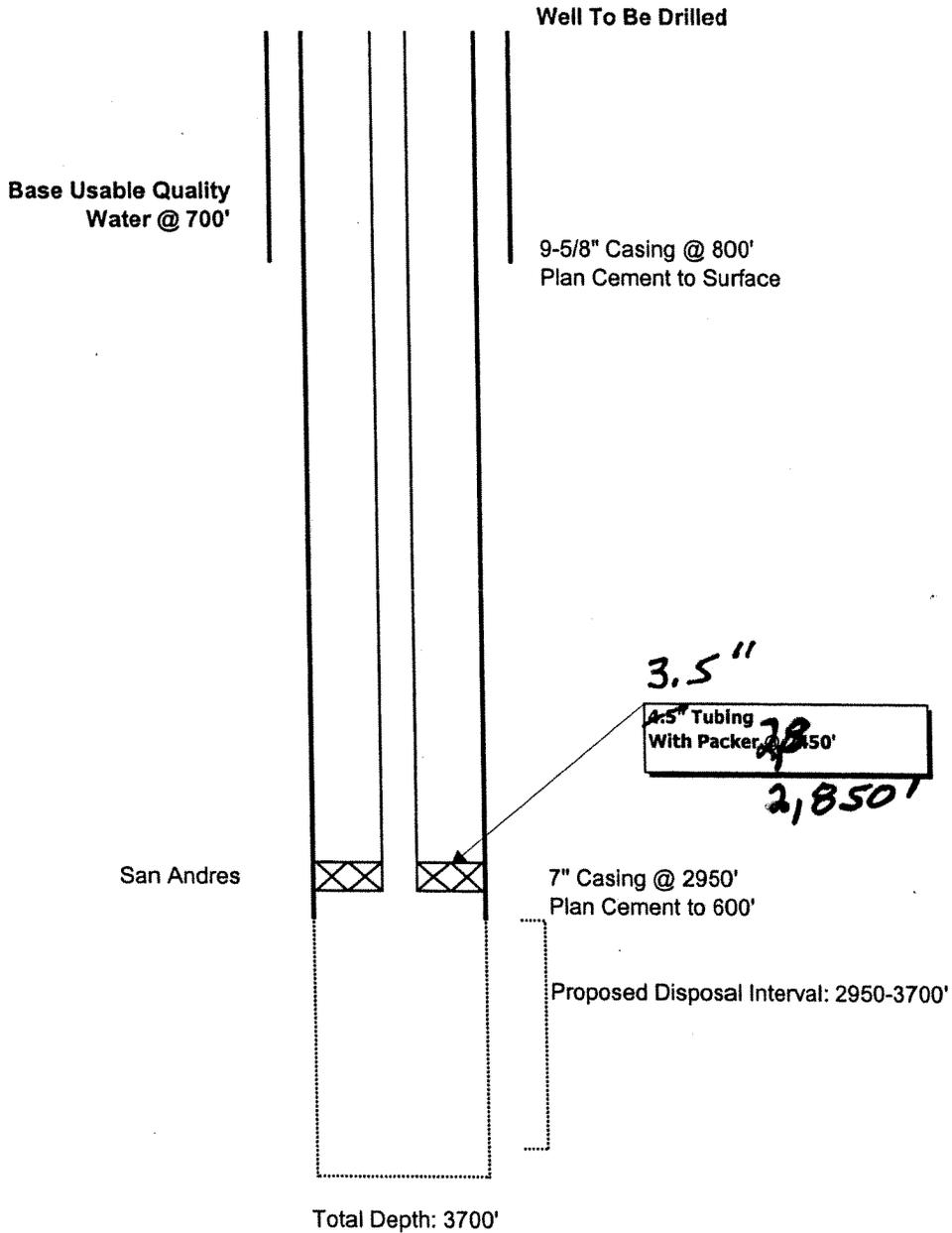


Exhibit No. 6
O&G Docket No. 7C-0284470
Date: Dec. 12, 2013
Feeler, Michael R.