



RAILROAD COMMISSION OF TEXAS

HEARINGS DIVISION

OIL AND GAS DOCKET NO. 01-0280430

THE APPLICATION OF TUNDRA ENERGY L.L.C. FOR COMMERCIAL DISPOSAL AUTHORITY PURSUANT TO STATEWIDE RULE 9 FOR THE T. E. PILGRIM SWD LEASE, WELL NO. 2, PILGRIM (AUSTIN CHALK) FIELD, GONZALES COUNTY, TEXAS.

HEARD BY: Richard D. Atkins, P.E. - Technical Examiner
Laura Miles-Valdez - Legal Examiner

PFD PREPARED BY: Paul Dubois - Technical Examiner

APPEARANCES:

REPRESENTING:

APPLICANT:

Stephen Fenoglio
Kerry Pollard
Pyotr Guler
Jason Roberts

Tundra Energy L.L.C.

PROTESTANTS:

Cleo Edmunds
James Baird
John Miller

Cleo Edmunds

OBSERVERS:

Kay English

PROCEDURAL HISTORY

Application Filed:	August 15, 2012
Protest Received:	September 4, 2013
Request for Hearing:	September 7, 2012
Notice of Hearing:	February 7, 2013
Hearing Held:	April 30, 2013
Transcript Received:	May 13, 2013
Proposal for Decision Issued:	July 16, 2013

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

Tundra Energy LLC (Tundra) requests authority pursuant to Statewide Rule 9 to operate Well No. 2 on its T.E. Pilgrim SWD Lease in Gonzales County as a commercial disposal well. The application is protested by a surface owner adjacent to the tract on which the proposed disposal well is located.

Notice of the application was published in the *Gonzales Inquirer*, a newspaper of general circulation in Gonzales County, on August 3, 2012. Notice of the application was sent to the Gonzales County Clerk, offset operators within 1/2 mile and to the surface owners of the disposal tract and each tract that adjoins the disposal tract.

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

The proposed disposal well is located on a 10-acre tract that is part of a larger 500 acre tract located at the southwest corner of the intersection of FM 1116 and CR 206. The tract is located in a rural area of Gonzales County, approximately 8.8 miles northeast of the town of Smiley. The 10-acre tract is currently owned by Ruddock Vaccinating Service, Inc. Tundra has an earnest money contract to buy the tract pending approval of the disposal well permit.

Tundra plans to drill the new injection well vertically to a depth of 12,600 feet. The well will have 9 5/8" surface casing set to a depth of 3,450 feet and cemented back to the surface with an estimated 885 sacks of cement. A 7" production casing will be set to 12,600 feet and cemented back to cover the top of the Austin Chalk, the shallowest hydrocarbon producing formation in the area, per the requirements of Statewide Rule 13. The top of the Austin Chalk is anticipated to be encountered at a depth of about 8,500 feet. A DV tool will be used to ensure adequate cement coverage through the producing formations. Tundra will install 4 1/2" injection tubing set with a packer at a depth of 10,350

feet, 50 feet above the proposed injection interval (See attached Tundra Exhibit No. 5 - Wellbore Diagram).

The proposed disposal interval is in the Georgetown, Edwards and Glen Rose formations from 10,400 feet to 12,600 feet. Tundra indicates that this injection interval is overlain by more than 100 feet of a 'tight' formation, and the base of the injection interval is underlain by the Sligo, or Hosston, formation, which is also tight. Thus Tundra opined that the injection interval is bounded on the top and bottom by significant impermeable horizons that would not accept fluids, thus confining the injected material within the intended zone.

Tundra requests authority to dispose of a maximum of 25,000 barrels of saltwater and RCRA¹ exempt waste per day with a maximum surface injection pressure of 5,200 psig. Average injection volume and surface injection pressure are anticipated to be 20,000 bbl/day and 5,100 psig, respectively.

The Commission's Groundwater Advisory Unit (GAU) determined the base of usable-quality groundwater to be at a depth of 3,350 feet below the ground surface. The base of underground source of drinking water (USDW) is 4,100 feet. By letter dated July 30, 2012, the GAU indicated that drilling this well and injecting oil and gas waste into the interval from 10,400 feet to 12,600 feet will not endanger the freshwater strata in this area.

A water well survey conducted for the applicant identified three water wells within a one-half mile radius of the proposed well, eight water wells within a one mile radius, and twenty wells within a two mile radius. One well located about a mile southeast of the site was drilled to a depth of about 1,200 feet; all of the other wells are shallower than 500 feet deep.

Tundra identified one well within the 1/4 mile radius of review for the proposed disposal well. The Nucorp Energy, Inc., Whiddow No. 1 well (API 177-30545) was drilled to a depth of 8,704 feet in 1980 and plugged in 1982. Within the 1/2 mile radius of review two active wells were identified. Both of these wells are horizontal wells completed in the Austin Chalk at a total vertical depth of 8,818 feet or less. Additionally, the surface locations for both of these wells were outside of the 1/2 mile radius of review; only the terminus locations were within the radius. The surface locations of two additional wells were located just outside of the 1/2 mile radius of review. These two wells were completed in February 2013 to a total vertical depth of about 9,450 feet in the Eagle Ford formation.

The vehicle entrance to the facility will be from CR 206, and vehicles will exit the facility onto FM 1116. The facility will be equipped to unload four tanker trucks at a time and have adequate driveway space to accommodate more than 20 tanker trucks at a time

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.

without backing up onto CR 206. Driveways will be constructed of compacted caliche, and the unloading facility will be 4,000 psi concrete. The facility separators, storage tanks and associated equipment will be located within a secondary containment structure to contain spilled fluids. The facility will comply with all of the permit conditions required by Commission staff.

A small portion of the disposal well tract is located within a 100-year flood plain. All facilities associated with injection and disposal operations, including the roadways, vehicle unloading area, tanks, secondary recovery structures and the disposal well are located two feet or more above the 100-year flood plain.

The proposed disposal well is located within an area of active development of the Eagle Ford trend, but there are no active saltwater disposal wells within a five mile radius. There are six activated commercial disposal wells within a 10 mile radius of the proposed well, and there is one permitted commercial disposal well within five miles of the proposed well. The injection intervals for all of these wells range from 4,446 feet to 7,430 feet, which likely represents the Wilcox formation or a shallower stratum, all of which are above the Eagle Ford formation. The proposed Tundra disposal well is the only well in the area that will inject fluids into formations below the current Eagle Ford play. Tundra originally sought to permit a disposal well in the Wilcox formation. Following a protest by the Gonzales County Underground Water Conservation District that objected to disposal into the Wilcox formation, Tundra revised its plans, instead injecting into the deeper Georgetown, Edwards and Glen Rose formations.

Tundra provided statements from two liquid hauling companies and one operating company in support of the permit application for the proposed facility. Each horizontal well frac job requires 100,000 to 500,000 barrels of water, 20 to 40% of which will be recovered and require disposal. Within the first year of production one horizontal Eagle Ford well can be expected to produce 25,000 to 50,000 barrels of salt water requiring disposal. The proposed disposal well is in the area of active Eagle Ford development over the last two and a half years, and wells continue to be permitted for future development. The proposed facility is designed and located to meet these disposal needs.

Tundra submits that it has the expertise to build and manage the proposed facility. Currently, the company has two years of experience as a partner in the operation of four saltwater disposal wells in the Eagle Ford and Permian Basin, one of which is in Gonzales County but is currently at capacity and cannot accept more water for disposal. Tundra's partners have in excess of 20 years of experience. Tundra has a current approved Form P-5 (Organization Report). The company has not yet established a \$25,000 bond for financial assurance with the RRC and indicated that it would do so upon approval of this permit. There are no pending Commission enforcement actions against Tundra.

Protestant's Evidence

The protestant is the owner of a tract of land adjoining the larger tract of which the 10 acre proposed disposal facility is a part. The protestant's land is to the northwest of the proposed disposal well and has been in her family for many generations. The protestant was concerned that the disposal well should be relocated to a better location in Gonzales County.

The protestant, who admitted to not being a geological, petroleum, or legal expert, argued that the applicant has not adequately investigated or described the subsurface geological features (in particular, the potential for the presence of faulting) at the location of the proposed disposal well. The protestant provided general and regional geologic information about faulting, but did not provide any specific information relating to the subject well site or immediate area. The specific concerns had to do with (1) the potential for induced seismic activity due to injection, (2) the integrity of the wellbore cement in the case of seismic activity, and (3) the potential for injected fluid migration along fractures, faults or casing following a seismic event.

The protestant also expressed concern about the potential for contamination of the groundwater and subsequent exposure and uptake of injected materials into the ground, soil, crops and livestock in the area of the proposed well. In the protestant's opinion, such effects would require a very long time horizon to monitor, and that the existing area injection wells have not been in operation for a sufficient time to observe potential impacts.

The protestant also pointed out that the nearest permitted injection well, the Jemez LLC, Tucker No. 1 well, on FM 1116 about 3 miles north of the Tundra site, was already under construction. This was an existing oil well that was permitted for conversion into a Wilcox formation disposal well.

EXAMINERS' OPINION

The examiners recommend that the application for commercial disposal authority be approved. Tundra has established:

1. The water resources (surface and sub-surface) are adequately protected from pollution;
2. The proposed injection well will not endanger or injure any known oil, gas, or mineral formations;
3. The proposed injection well is in the public interest;
4. A satisfactory showing of financial responsibility, as required under Texas Statutes and Commission Rules, or the commitment to provide such upon permit approval.

The proposed disposal well facility, as designed, will be protective of groundwater, surface water, and hydrocarbon resources in the area. Usable-quality groundwater down to a depth of 3,350 feet below the land surface will be protected by the placement of 9 5/8" surface casing set at 3,450 feet and cemented to the surface. A 7" production casing will be run to 12,600 feet and cemented to the top of the Austin Chalk (estimated to be at 8,500 feet below ground surface), isolating the Austin Chalk and Eagle Ford productive intervals from the injection interval. The proposed well will inject fluids into the Georgetown, Edwards and Glen Rose formations from a depth of 10,400 to 12,600 feet. There is over 100 feet of tight formation above (Buda and Del Rio formations) and below (Sligo formation) the proposed disposal interval, which will serve to prevent the migration of injected fluids out of the disposal interval.

The surface facility will be newly constructed and is of sufficient size to accommodate trucks hauling water to the facility. The facility will have a pass-through driveway from CR 206 to FM 1116 and will be able to accommodate more than 20 trucks with four unloading at a time. Surface facilities such as tanks, separators and pumps will be located within a secondary containment structure. Except for a small unimproved portion of the tract, the facility will be located above the 100-year flood plain. Additionally, the facility will comply with all of the permit conditions required by Commission staff.

Approval of the application is in the public interest. The proposed Tundra disposal facility is located in the southern part of Gonzales County in an area that is actively being developed with horizontal wells completed in the Eagle Ford formation. There are several hundred drilled or permitted Eagle Ford wells within a 10-mile radius of the proposed facility. Completion of these wells generates enormous amounts of water requiring treatment, recycling or disposal. The former two options are currently limited or non-existent, resulting in a need for significant disposal capacity to meet the current and projected future exploration and production demands of the Eagle Ford play. There are six disposal wells within a 10-mile radius and one well permitted within a five mile radius. Of all of these wells, only the proposed Tundra well is seeking authority to inject into strata below the currently productive Eagle Ford and Austin Chalk formations. Further, at least one of the commercial disposal wells is operating at capacity. Operators and waste haulers have expressed an interest in increasing disposal capacity both in this particular area and within the Eagle Ford trend in general.

FINDINGS OF FACT

1. Notice of this hearing was given to all persons entitled to notice at least ten (10) days prior to the hearing. Notice of the application was published in the *Gonzales Inquirer*, a newspaper of general circulation in Gonzales County, on August 3, 2012.
2. Notice of the application was sent to the Gonzales County Clerk, offset operators within 1/2 mile and to the surface owners of the disposal tract and each tract that adjoins the disposal tract.

3. The proposed injection into the T.E. Pilgrim SWD Lease, Well No. 2, will not endanger useable quality water.
 - a. The Commission Groundwater Advisory Unit ("GAU") recommends that usable-quality groundwater be protected down to a depth of 3,350 feet below the land surface.
 - b. The well will have 9 5/8" surface casing set at 3,450 feet that will be cemented to the surface with 885 sacks of cement.
 - c. There is over 100 feet of tight formation above and below the proposed disposal interval, which will serve to prevent the migration of injected fluids out of the disposal interval.
 - d. Surface facilities will be constructed above the 100-year flood plain.
 - e. The separators, storage tanks and pumps will be located within a secondary containment structure.
4. The proposed injection into the T.E. Pilgrim SWD Lease, Well No. 2, will not endanger production from other oil, gas or mineral bearing formations.
 - a. The Georgetown, Edwards and Glen Rose formations are deeper than the Austin Chalk and Eagle Ford formations, which are the recent and current targets of hydrocarbon development in the area.
 - b. Tundra proposes to run 7" production casing to 12,600 feet that will be cemented up to the top of the Austin Chalk (estimated to be at 8,500 feet below ground surface).
 - c. The well will be equipped with 3 1/2" tubing and packer set at 10,350 feet.
 - d. One plugged oil well was identified with the 1/4 mile radius of review.
 - e. Two producing horizontal wellbores are located within the 1/2 mile radius of review. The vertical wellbores for these wells are outside of the 1/2 mile radius. These wells produce from the Pilgrim (Austin Chalk) field, which is above the proposed disposal interval.
5. Use of the T.E. Pilgrim SWD Lease, Well No. 2, as a commercial disposal well is in the public interest because it will reduce hauling distances and will provide needed commercial disposal capacity for wells to be drilled, completed and produced in the area of the proposed facility.

- a. The proposed facility is within the area of active Eagle Ford formation development, which includes Gonzales, DeWitt and other counties.
 - b. A ten mile radius map around the proposed disposal facility depicts several hundred permitted or drilled Eagle Ford wells.
 - c. The Eagle Ford formation trend wells will produce significant volumes of frac flowback and produced water and additional disposal facilities are necessary to accommodate the Eagle Ford formation development that is ongoing in Gonzales and surrounding counties.
 - d. There are six active disposal facilities located within a ten mile radius of the proposed facility, in addition to one permitted disposal well under construction three miles north of the proposed facility.
 - e. Additional disposal facilities are necessary to accommodate the Eagle Ford formation development that is ongoing in Gonzales and surrounding counties.
 - f. The use of the proposed disposal well will help to meet the demand for saltwater disposal produced by nearby wells.
7. Tundra has a current approved Form P-5 (Organization Report).
- a. Tundra has not yet placed a \$25,000 bond or other financial assurance with the Commission, but will have the bond in place prior to drilling the proposed well.
 - b. There are no pending Commission enforcement actions against Tundra.

CONCLUSIONS OF LAW

1. All things necessary to give the Railroad Commission jurisdiction to consider this matter have now occurred.
2. Approval of the application will not harm useable-quality water resources, will not endanger oil, gas, or geothermal resources, will promote further development in this area of Gonzales County and is in the public interest pursuant to Sec. 27.051 of the Texas Water Code.
3. Tundra has met its burden of proof and its application satisfies the requirements of Chapter 27 of the Texas Water Code and the Railroad Commission's Statewide Rule 9, with the exception of the financial assurance bond that it will establish upon permit approval.

EXAMINERS' RECOMMENDATION

Based on the above findings of fact and conclusions of law, the examiners recommend that the Commission approve the application of Tundra Energy LLC for commercial disposal authority pursuant to Statewide Rule 9 for the T.E. Pilgrim SWD Lease, Well No. 2, as set out in the attached Final Order.

Respectfully submitted,

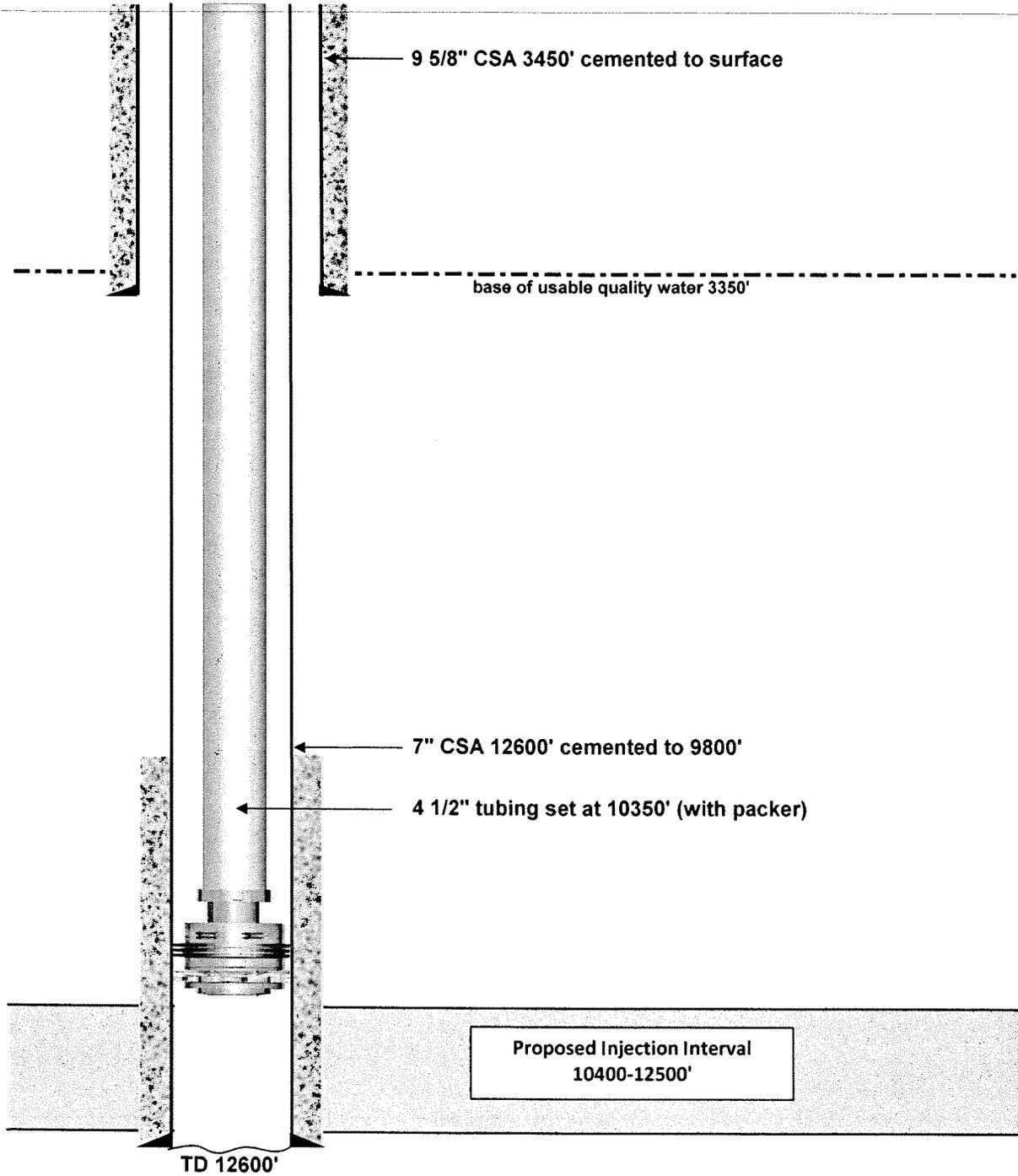


Richard D. Atkins, P.E.
Technical Examiner



Laura Miles-Valdez
Legal Examiner

Wellbore Sketch
Tundra Energy, LLC
TE Pilgrim SWD #2
According to W14
Gonzales County, Texas



Tundra Energy, LLC *S*
Exhibit No. _____
Docket No. 01-0280430
April 30, 2013