THE APPLICATION OF WHITEHEAD PRODUCTION CO., INC. TO INJECT FLUID INTO A RESERVOIR NOT PRODUCTIVE OF OIL OR GAS, HARPER LEASE WELL NO. 1, NEWARK, EAST (BARNETT SHALE) FIELD, HILL COUNTY, TEXAS

HEARD BY: Donna K. Chandler, Technical Examiner Mark J. Helmueller, Hearings Examiner

APPEARANCES:

APPLICANT:

REPRESENTING:

Rex White Whitehead Production Company Alan Means Wayne Schkade Tom Cokeley Jane Whitman **PROTESTANTS:** (Party Status) David Frederick Barbara Goerdel Ernest Goerdel Barbara and Ernest Goerdel Robert Tull Nilda Tull Robert and Nilda Tull (Statements Only) Lionel Milberger Self Dorothy Milberger Self Marisa Hart Reese Self Bobby Blanton Self Janie Blanton Self Lou Blanton Self Matt Tanner Self Cynthia Tanner Self Susan Cook Self Hubert Tefteller Self

PROCEDURAL HISTORY

Application Filed: Request for Hearing: Notice of Hearing: Date of Hearing: Transcript Received: Proposal For Decision Issued:

October 6, 2006 January 9, 2007 April 4, 2007 April 23 and June 8, 2007 June 15, 2007 July 16, 2007

EXAMINERS' REPORT AND PROPOSAL FOR DECISION

STATEMENT OF THE CASE

Whitehead Production Co., Inc. ("Whitehead") requests authority pursuant to Statewide Rule 9 to operate Well No. 1 on its Harper Lease in Hill County as a commercial disposal well. This application is protested by numerous land owners in the area of the proposed well.

DISCUSSION OF THE EVIDENCE

Applicant's Evidence

The subject well was drilled in 1986 to a total depth of 8,390 feet. The well was never completed and was plugged in October 1986. The well has 1,909 feet of 85%" surface casing cemented to surface. The Texas Commission on Environmental Quality recommends that usable-quality ground water be protected to a depth 20 feet below the base of the Cretaceous-age beds, which is expected to occur at 1,600 feet. TCEQ therefore recommends that surface casing be set to a depth of 1,620 feet. The well has approximately 760 feet of 27%" tubing cemented at total depth. The well has plugs set at 7,890, 1,898 and 1,575 feet. Whitehead plans to re-enter the well and sidetrack around the cemented tubing. Whitehead proposes drilling to a depth of approximately 9,000 feet, with 7" casing set to total depth. With the use of a multi-stage cementing tool at approximately 5,500 feet, the top of cement behind the 7" casing is expected to be at approximately 1,500 feet. (See attached wellbore diagram.) There are no wellbores within a 14 mile radius of the proposed disposal well.

The proposed injection will be through 4½" tubing set on a packer at approximately 7,900 feet, but no higher than 100 feet above the top of the injection interval. The proposed injection interval is the non-productive Ellenburger formation, the top of which is found at 7,935 feet. The proposed injection interval is between 7,935 and 9,000 feet. A log of the Harper No. 1 indicates the presence of the Viola Simpson shale barrier separating the Barnett Shale and the Ellenburger. The Viola Simpson in this well is 65-75 feet thick. The proposed maximum injection volume is 35,000 BWPD, with an estimated average of 25,000 BWPD. The proposed maximum injection pressure is 3,965 psig.

The proposed facility will be located on several adjoining tracts which total approximately 20 acres, including roads. These adjoining tracts are owned by different surface owners. The entrance to the facility is off of County Road 1439. A road approximately 75 feet wide will access the facility from CR 1439. This road will lead to a 3.25 acre pad where a fresh water well has been drilled. Another road will lead to a 10 acre pad where tanks and pumps will be located and trucks will be unloaded. The disposal well will be located on a two acre site approximately 1,000 feet from the 10 acre pad. (See attached plat.) Some water may be piped to the facility from wells located near the facility.

On the 10 acre pad, there will be an area of approximately 90 feet by 180 feet on which the tanks will be located. This tank area will be surrounded by a five-foot tall steel containment system which includes an integrated liner. The entire 10 acre pad will be surrounded by a 2-3 foot earthen berm. Earthen berms will also surround the tract on which the disposal well is located and all roads. There will be an attendant on site 24 hours a day and the entire facility will be fenced for security. The entire facility will be designed for an automatic shut-down in the case of a pressure-drop, which would indicate a leak.

In response to protestants' concerns at the initial hearing, Whitehead cleared trees/brush at the intersection of CR 1439 and CR 1450 in order to increase the visibility if trucks are traveling on CR 1439. Whitehead also contacted the Hill County Commissioner, who agreed to maintain the sight lines at that intersection. The County has also agreed to install speed limit and school bus stop signs on CR 1439.

In the past year, over 1,000 drilling applications for Barnett Shale wells were filed in Hill and adjoining Johnson Counties. There are currently no active commercial disposal wells in Hill County. Whitehead believes that the proposed well is essential to provide a safe, economic means of disposal for the large volumes of produced water associated with fracture stimulation and production of Barnett Shale wells. Whitehead has a partnership with Total Services to deliver the water it hauls to the proposed well.

Commission records indicate that Whitehead is an active operator with 9 wellbores. Whitehead has financial assurance posted in the amount of \$25,000.

Whitehead submitted pressure front calculations which indicate that injection at 25,000 barrels per day for one year will increase the reservoir pressure by about 1,100 psi to 4,777 psi, at a distance 10 feet from the wellbore. After 20 years, the reservoir pressure at 10 feet will increase an additional 200 psi. Assuming 35,000 barrels per day for 20 years, the reservoir pressure 10 feet from the wellbore would increase to 5,512 psi, which would exceed the fracture pressure estimated to be 5,395 psi, assuming 0.68 psi/foot and an original reservoir pressure of 3,681 psi. Whitehead has offered to perform a step-rate test on the well prior to disposal operations in order to determine actual fracture pressure of the formation. Whitehead pointed out that it would likely only need to dispose of up to 35,000 barrels per day infrequently.

Notice of the subject application was published in *The Hillsboro Reporter*, a newspaper of general circulation in Hill County, on September 25, 2006. A copy of the application was mailed to the Hill County Clerk's Office on September 21, 2006. Also on September 21, 2006, Whitehead mailed copies of the application to the only offsetting operator, EnCana Oil & Gas (USA) Inc. and to surface owners directly offsetting the two acre tract on which the well is located. Following this initial notice, Whitehead was instructed by the Commission's staff to notify all surface owners within ½ mile of the wellbore. Whitehead mailed a copy of the application were received and the hearing was held on April 23, 2007. Subsequent to the hearing, the examiners received returned mailings of the Notice of Hearing and Whitehead was instructed to publish the notice of reopened hearing. The notice was published on May 3, 10, 17 and 24, 2007 in *The Hillsboro Reporter*.

Protestants' Evidence

Mr. and Mrs. Goerdel requested party status as a protestant. They own and reside on property between the proposed facility and County Road 1439. Aquilla Creek crosses CR 1439 just to the southwest of the Goerdel property. The bridge over Aquilla Creek is only 25 feet wide. Additionally, a smaller creek known as Rock Creek crosses CR 1439 to the northeast of the Goerdel property. The county road is gravel and is only 20-21 feet wide at the crossing of Rock Creek. Whitehead has built the entrance to its proposed facility. This entrance is located at a high point on the road, and very near a school bus stop. The Goerdels are concerned about safety issues regarding the entrance and the volume of truck traffic on these county roads. They are also concerned about the adverse affects of this facility on the quality of life they currently enjoy and value of their property.

Additionally, the Goerdels, like many of their neighbors, have leased their mineral rights. They are concerned that disposal into the Ellenburger will adversely affect any potential production from the Barnett Shale.

Mr. and Mrs. Tull also requested party status as a protestant. They own and reside on property adjacent to the Goerdel's property on CR 1439. The Tulls have similar concerns as the Goerdels regarding traffic and safety.

Ms. Reese, Ms. Cook, the Milbergers, the Blantons and the Tanners did not request party status. They were given the opportunity to make statements of their positions. They expressed similar concerns regarding truck traffic, safety at school bus stops, decreased quality of life, decreased property values and possibility of injected water escaping to the Barnett Shale.

The examiners recommend that the application be approved, with the limitation that the injection interval be from 8,120 to 9,000 feet. It is recommended that the maximum surface injection pressure be 4,060 psi, which is based on 0.5 psi/foot of depth to 8,120 feet, which is the recommended top of the injection interval. Consistent with Whitehead's agreement, the examiners also recommend that the permit contain a condition that a step rate test be run prior to injection, to insure that the maximum surface injection pressure of 4,060 psi will not fracture the Ellenburger formation. Additionally, the examiners recommend that the maximum injection volume be 25,000 BPD, in keeping with Commission policy in similar cases involving Ellenburger disposal since December 2006.¹

The log of the Harper No. 1 indicates the base of the Barnett Shale to be approximately 7,870 feet. Beneath the Barnett Shale is the Viola Simpson, to a depth of about 7,935 feet. The examiners believe that at least 250 feet of separation between the Barnett Shale and the top of the injection interval is necessary to prevent communication between the productive Barnett Shale and the Ellenburger injection interval. Commission policy requires that the authorized injection strata be isolated from overlying useable quality water by a sufficient thickness of relatively impermeable strata, which is generally considered to be an accumulative total of at least 250 feet of clay or shale. The examiners recommend that a similar standard be followed to protect the Barnett Shale.

The Harper No. 1 will be completed in a manner which will confine disposal fluids to the proposed disposal interval in the Ellenburger. The well has 1,909 feet of $8\frac{5}{8}$ " surface casing cemented to surface, which exceeds the requirements of the Texas Commission on Environmental Quality's recommendation that usable-quality ground water be protected to a depth 20 feet below the base of the Cretaceous-age beds, which is expected to occur at 1,600 feet. Additionally, Whitehead will set production casing to approximately 9,000 feet and use a multi-stage cementing tool at approximately 5,500 feet to bring the top of cement behind the 7" casing to approximately 1,500 feet. There are no wellbores within a $\frac{1}{4}$ mile of the Harper No. 1 which could provide a conduit for migration of fluids.

Approval of the requested permit is in the public interest given the development of the Barnett Shale in the area and the lack of commercial disposal facilities in Hill County. With the large fracture treatments necessary to stimulate production of the Barnett Shale and the accompanying produced frac water, sufficient commercial disposal facilities like the proposed well are necessary. Whitehead has a contract with at least one trucking company to dispose of its hauled water. The design of the facility is such that any leak will be immediately detected. Whitehead plans to use state-of-the-art containment around the storage tanks, including a liner and 5 foot steel barrier. Whitehead has also undertaken measures to increase safety on the county roads in the area by clearing trees and working with the county the have additional signs installed for speed limits and school bus stops.

¹Should the step rate test indicate that a larger volume of water can be injected into the Ellenburger without fracturing the formation, Whitehead may filed an amended application for Commission consideration.

Public safety related to oil and gas operations is a paramount responsibility of the Commission, as expressed in Texas Natural Resources Code Section 85.042(b). However, the Commission does not possess either the jurisdiction or expertise to evaluate potential traffic safety issues which may arise from the increased use of public roadways used for access to a disposal facility. Local governmental entities with jurisdiction over local roads, county roads, and other byways, state governmental entities with jurisdiction over state roads and highways, and federal governmental entities with jurisdiction over federal highways and interstates, all may have potential responsibility and jurisdiction to consider the types of traffic safety issues raised by Protestants.

FINDINGS OF FACT

- 1. Notice of this hearing was given to all persons entitled to notice pursuant to Statewide Rule 9. Notice of the re-opened hearing was published in *The Hillsboro Reporter* on May 3, 10, 17 and 24, 2007.
- 2. The Harper No. 1 was drilled in 1986 to a total depth of 8,390 feet. The well was never completed and was plugged in October 1986.
- 3. The Harper No. 1 will be cased and cemented in a manner to protect usable quality water and injection will be confined to the injection interval.
 - a. The Texas Commission on Environmental Quality recommends that usable-quality water be protected to 1,620 feet in the area of the proposed well.
 - b. The subject well has 1,909 feet of 8 ⁵/₈" surface casing cemented to surface.
- 4. Fluids injected into the Harper No. 1 will be confined to the injection interval.
 - a. The subject well will have approximately 9,000 feet of 7" casing cemented up to approximately 1,500 feet.
 - b. Injection will be through tubing set on a packer no higher than 100 feet above the top of the injection interval.
 - c. There are no wellbores within one-quarter mile of the proposed disposal well.
- 5. Use of the Harper No. 1 Well as a disposal well is in the public interest to promote the active development of the Barnett Shale in Hill County.
 - a. Use of the well will provide a safe, economic means of disposal of the

fluids associated with production.

- b. In the past year, over 1,000 drilling applications for Barnett Shale wells were filed in Hill and adjoining Johnson Counties.
- c. There are currently no active commercial disposal wells in Hill County.
- d. Whitehead has a contract with Total Services to deliver the water it hauls to the proposed well.
- 6. The use or installation of the proposed injection well will not endanger or injure any oil, gas, or other mineral formation.
 - a. The Viola Simpson is present between the productive Barnett Shale and the Ellenburger and is approximately 75 feet thick.
 - b. Limiting the disposal interval to 8,120-9,000 feet will provide 250 feet of separation between the base of the Barnett Shale and the disposal interval.
- 7. With proper safeguards, as provided by terms and conditions in the attached final order which are incorporated herein by reference, both ground and surface fresh water will be adequately protected from pollution.
 - a. The area on which the storage tanks are to be placed will be surrounded by a five-foot tall steel containment system which includes an integrated liner.
 - b. The entire 10 acre pad on which the storage tanks are to be placed will be surrounded by a 2-3 foot earthen berm to contain any spill.
 - c. Earthen berms will surround the tract on which the disposal well is located and all roads.
- 8. Whitehead Production Co., Inc. is an active operator with financial assurance in the amount of \$25,000.

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. The use or installation of the proposed injection well is in the public interest.
- 4. The use or installation of the proposed injection well will not endanger or injure any oil, gas, or other mineral formation.
- 5. Operation of the well under the terms of the proposed permit will protect both ground and surface fresh water from pollution.
- 6. Whitehead Production Co., Inc. has made a satisfactory showing of financial responsibility to the extent required by Section 27.073 of the Texas Water Code.
- 7. Whitehead Production Co., Inc. has met its burden of proof and satisfied the requirements of Chapter 27 of the Texas Water Code and the Railroad Commission's Statewide Rule 9.

EXAMINERS' RECOMMENDATION

Based on the above findings and conclusions, the examiners recommend that the application be approved as set out in the attached Final Order, with limitations on volume and the depth of disposal interval.

Respectfully submitted,

Donna K. Chandler Technical Examiner Mark J. Helmueller Hearings Examiner