March 15, 2007

OIL AND GAS DOCKET NO. 8A-0249456

THE APPLICATION OF INVOIL, INC. TO INJECT FLUID INTO A FORMATION PRODUCTIVE OF OIL OR GAS, VAN LEASE WELL NO. 1, BAY (SAN ANDRES) FIELD, YOAKUM COUNTY, TEXAS

HEARD BY: Thomas H. Richter, P.E., Technical Examiner
Mark Helmueller, Hearings Examiner

APPLICANT:	**REPRESENTING:**
Rex White, Jr., Attorney	Invoil, Inc.
Greg Cloud, P.E.	
Russell B. Bainbridge, Jr.	
PROTESTANT:	
Ernest M. Barnett, P.E.	Barnett Energy, Inc. & Ernest M. Barnett

PROCEDURAL HISTORY

Date of Application:	October 25, 2006
Date of Notice:	December 12, 2006
Date of Hearing:	January 12, 2007
Date of Transcript:	None Requested
Date of Late Filed Exhibit:	January 29, 2007
Record Closed:	February 9, 2007
Proposal For Decision Issued:	March 15, 2007

EXAMINERS' REPORT AND PROPOSAL FOR DECISION
STATEMENT OF THE CASE

This is the application of Invoil, Inc, ("Invoil") to re-enter the Vera Van Lease Well No. 1 and re-complete the well as a disposal well. The protestant has a producing well that currently produces from a portion of the proposed zone of injection and believes the injection will adversely affect the recovery of hydrocarbons from its well. Protestant also asserts that Invoil does not have a good faith claim to re-enter the well as it has no lease.

DISCUSSION OF THE EVIDENCE

APPLICANT'S EVIDENCE

Invoil proposes the re-entry of the Vera Van Well No. 1 and re-completing the well as a saltwater disposal well to dispose of saltwater produced by its one producing well.

The Vera Van Lease Well No. 1 was drilled and plugged by Sinclair Oil & Gas in 1963. The well was completed as follows:

- Surface casing (13-3/8") is set at 379' and cemented from the casing shoe to the ground surface.
- Intermediate casing (9-5/8") is set at 4,623' and cemented from the casing shoe to the ground surface.
- The well was drilled to 11,995' subsurface depth and was properly plugged.

The Commission issued an injection permit on February 21, 2006, based on the information contained in Invoil's application dated January 3, 2006. The permit granted authority to inject into the interval from 4,623' to 5,800'; maximum injection volume of 400 BWPD and a maximum injection pressure of 1500 psig (Project No. F 17024). On March 2, 2006, Barnett Energy filed a protest. On March 7, 2006, the Commission suspended the permitted injection authority.

Invoil proposes re-entering the well by drilling out the plugs to 6,000' subsurface depth. Tubing (2-1/2") will be set at 4,523' on a packer. The disposal interval will be from 4,623' to 6,000' (an open hole section) which includes the San Andres Formation.[1] The depth to the base of the deepest fresh water is 350' (TCEQ letter dated January 30, 2006).

Produced water from the Invoil, Patton Well No. 1 (4,500' north) in the Bronco, SW (Devonian) Field will be disposed of in the proposed disposal well (a connecting disposal pipeline will be installed). The Patton well currently produces at 9 BOPD and 127 BWPD and is the only well in the field. Cumulative production from the well is 41,730 BO. Current operating expenses for the Patton Lease are $7,215/month which is at the economic limit. The disposal well will lower the lease expense to $2,000/month and facilitate the economic recovery of an additional 10,000 BO.

The protestant's well is in the Bay (San Andres) Field which was discovered in 1968 at a depth of 5,350' subsurface depth. Barnett Energy is the only operator in the field . It operates only one producing well, the Van Robinson Unit Well No. 2.

The Van Robinson Well No. 2 was completed in 1969 through perforations from 5,246' to 5,414' subsurface depth and is located ± 940' southeast of the proposed disposal well. Longstring casing was set at 5,549' and cemented with 300 sacks. Cement calculations indicate the top of cement at 4,413' subsurface depth (assumes 25% washout equal to that used by the Commission). Thus, the Van Robinson well has cement across the entire proposed injection interval which will prevent the migration of any injected fluids if those fluids were to ever even reach the Barnett Energy well.

Disposal into the proposed well should not effect the Van Robinson well. The proposed disposal zone is over 1,300' of open hole interval (4623'- 6000'). The Van Robinson well is

[1] Form 4 - Plugging Report shows a 25 sk cement plug from 6000' - 6050'.

perforated over a 168' interval. Though there may be only 20' of net pay (formation that contains oil/gas) in the San Andres, the San Andres Formation extends over a much greater interval. Indeed, if the injected waters could possibly affect the Van Robinson well there may be a waterflood benefit for the recovery of reserves.

Invoil, Inc. is an operator in good standing. It has posted a $25,000 bond for financial assurance as required by the Commission.

Notice was given to the surface owner and all operators within one-half mile. Notice of this application was published in the *Denver City News*, a newspaper of general circulation in Yoakum County, on January 29, 2006. The application was filed with the Yoakum County Clerk on February 10, 2006.

Invoil claims it possesses a good faith claim of a right to operate the well as a disposal well based on a water disposal contract it obtained from the owner of the surface and mineral interest. A copy of the water disposal contract was submitted as a late-filed exhibit.

PROTESTANT'S EVIDENCE

Barnett Energy operates the only producing well in the Bay (San Andres) Field. The Van Robinson currently produces ±2 BOPD and ± 8 BWPD. The current water-oil ratio is a78% water cut. Barnett asserts that an oil bank can not be created in a reservoir that is already at a 78% water cut. Therefore, waterflood potential effects will not be seen. The well will "water-out" and become uneconomical to produce. The well has been on a stabilized annual decline rate of 1% for many years. Based on this rate, the future recovery of this well will be 55,000 BO over the next 92 years based on an economic limit of 1 BOPD. Invoil estimates the net pay thickness of the San Andres to be 20' (Form H-1, Invoil Exh. No. 3). Thus, using Invoil's net pay thickness, the water front calculation estimates the time to reach the Van Robinson well to be 660 days at 300 BWPD injection. Barnett believes its well will only recover 1,633 BO before watering out and the remaining oil reserves lost. Invoil may recover some additional reserves from its well but the volume of reserves is far less than what will be lost by the Van Robinson well.

Barnett claimed at the hearing that Invoil had not perfected its claimed right to convert the Vera Van No. 1 well to injection. Barnett provided documentation that it was the owner of the mineral interest of a portion of the southernmost 40 acres of the southwestern 160 acres in Section 585. However, Barnett conceded that it did not own the mineral interest for the acreage on which the Vera Van No. 1 well is located.

EXAMINERS' OPINION

The examiners recommend the application be approved pursuant to §27.051 of the Texas Water Code and Commission Statewide Rule 46. The water front analysis utilized by Barnett errs as it is falsely predicated on only 20' of over 1300' of formation thickness that will accept fluid. The calculation results in an overestimate of the radial water front formation fill-up/advance of water

injected into the disposal well. Essential in the water front (invaded area) calculation is the thickness of the zone taking water. The greater the interval accepting water, the lesser the area invaded. The overall gross perforated interval in the Barnett well is 168'. This represents not only those zones that are believed to be productive of oil and/or gas (based on porosity and water saturations) but also those zones which are believed to have lesser porosity, greater water saturations or any combination of both. Using 168' (which represents only ± 13% of the entire proposed injection interval) and assuming the proposed maximum 400 BWPD is injected everyday every year (Barnett used 300 BWPD), the water front calculation estimates approximately 11 years to reach the Barnett well. Throughout a reservoir, there are permeability differences, thickness differentials and other heterogeneities. The Barnett well is ± 940' from the subject disposal well. The probability of the proposed injection well effecting the Barnett well are negligible.

In order to assure and prevent fluid migration away from the intended zone of disposal, the examiners recommend that upon re-entry and re-completion of the subject disposal well that the cement plug reportedly set at 6,000' subsurface depth be tagged. If the plug is not present or found to be set deeper, the operator shall perform remedial work, i.e. set a cement plug the top of which shall be at least 6,000' subsurface depth. The Commission District Office shall be notified prior to the tagging of the plug and if subsequently necessary, the re-setting of the cement plug.

There is no evidence to indicate that the operation of this well will adversely impact the water quality of any nearby surface water or subsurface usable quality water. Additionally, the water disposal contract Invoil obtained from the surface and mineral interest owner establishes a good faith claim of a right to operate the well.

FINDINGS OF FACT

1. Notice of this hearing was given to all persons required to be given notice by the provisions of Statewide Rule 46. Notice of this hearing was given to all affected persons, at least ten (10) days prior to the date of the hearing.

2. The Invoil, Inc., Vera Van Lease Well No. 1 was drilled and properly plugged by Sinclair Oil & Gas in 1963.

    a. The well was drilled to a total depth of 11,995' subsurface depth. Surface casing (13-3/8") is set at 379' and cemented from the casing shoe to the ground surface and intermediate casing (9-5/8") set at 4,623' and cemented from the casing shoe to the ground surface.

3. Invoil proposes the re-entry of its Vera Van Well No. 1 and re-completing the well as a saltwater disposal well to dispose of saltwater produced by its one producing well, the Patton Lease Well No. 1 in the Bronco, SW (Devonian) Field, which currently produces an average of 127 BWPD.

    a. Invoil proposes re-entering the well by drilling out the plugs to 6,000' subsurface

depth.

b. Tubing (2-1/2") will be set at 4,523' on a packer.

c. The disposal interval will be from 4,623' to 6,000' (1,337' open hole section) which includes the San Andres Formation.

4. The depth to the base of the deepest fresh water is 350' (TCEQ letter dated January 30, 2006).

5. Invoil proposes that the maximum disposal volume of 400 BWPD and the maximum surface injection pressure be 1,500 psig.

6. The Barnett Energy, Van Robinson Lease Well No. 2 is located ± 940' from the proposed disposal well and is completed through perforations from 5,246' to 5,414' subsurface depth in the Bay (San Andres) Field in 1969 and is the only well within the 1/4 mile review area.

a. The well currently produces ± 2 BOPD and ± 8 BWPD for a 78% water cut.

7. Injection into the proposed disposal well will not result in the loss of otherwise recoverable reserves from the Van Robinson Lease Well No. 2 completed in the Bay (San Andres) Field.

8. Zonal isolation has been/shall be accomplished to prevent the migration of injected fluids to zones other than the intended zone of injection and for the protection of usable quality water.

a. All well completions, producing or plugged, within a 1/4 mile radius of the subject well have been completed and/or plugged in a manner that will prevent fluid migration.

b. Upon re-entry and re-completion of the subject disposal, actions shall be taken to assure the presence of a cement plug set at a depth of 6,000' or less.

9. The safe and proper disposal of produced saltwater serves the public interest.

10. Re-entry into the well for the purpose of converting it to injection operations is in the public interest as lease operating expenses for the Patton Lease Well No. 1 in the Bronco, SW (Devonian) Field will be reduced. This will facilitate the economic recovery of an estimated 10,000 barrels of oil.

11. The operation of the subject well will not adversely impact the water quality of any nearby surface water or subsurface usable quality water.

12. Invoil, Inc. does have a current approved form P-5 and maintains a $25,000 bond for

financial assurance as required by the Commission.

CONCLUSIONS OF LAW

1. Proper notice was timely given to all parties entitled to notice pursuant to applicable statutes and rules.

2. All things have occurred and have been accomplished to give the Commission jurisdiction in this case.

3. The use of the proposed injection well will not endanger oil, gas, or geothermal resources or cause the pollution of surface water or fresh water strata unproductive of oil, gas, or geothermal resources.

4. The applicant has complied with the requirements for approval set forth in Statewide Rule 46 and the provisions of Sec. 27.051 of the Texas Water Code.

5. The use of the proposed injection well is in the public interest pursuant to Sec 27.051 of the Texas Water Code.

6. Approval of the application will prevent waste of hydrocarbons that otherwise would remain unrecovered.

EXAMINERS' RECOMMENDATION

Based on the above findings and conclusions, the examiners recommend that the application of Invoil, Inc. for a disposal permit to for its Van Lease Well No. 1 be approved as set out in the attached Final Order.

Respectfully submitted,

Thomas H. Richter, P.E.
Technical Hearings Examiner
Office of General Counsel

Mark Helmueller
Hearings Examiner
Office of General Counsel