

OIL AND GAS DOCKET NO. 06-0255034

THE APPLICATION OF ATLANTIS OIL COMPANY, INC. TO INJECT FLUID INTO A RESERVOIR PRODUCTIVE OF OIL OR GAS, MOODY NATIONAL BANK WELL NO. 6, GOOD SPRINGS, W. (WOODBINE) FIELD, RUSK COUNTY, TEXAS

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

APPEARANCES:

John Quinlan
John Musselman

John Soule
Greg Cloud

REPRESENTING:

Atlantis Oil Company, Inc.

Rebel Production Company and
Gene Powell Investments

REVISED EXAMINERS' REPORT AND PROPOSAL FOR DECISION

PROCEDURAL HISTORY

Application Filed:	August 27,2007
Protest Received:	August 8, 2007
Request for Hearing:	December 6,2007
Notice of Hearing:	January 11, 2008
Date of Hearing:	February 5, 2008
Transcript Received:	March 13, 2008
Proposal For Decision Issued:	April 28, 2008

STATEMENT OF THE CASE

Atlantis Oil Company, Inc. ("Atlantis") requests authority pursuant to Statewide Rule 46 to inject salt water into the Woodbine formation in the Moody National Bank Well No. 6 in the Good Springs, W. (Woodbine) Field.

This application is protested by Rebel Production Company ("Rebel") and Gene Powell Investments ("Powell"). These operators have producing wells in the field which they believe will be adversely affected by the proposed injection.

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

Atlantis proposes to use the Moody National Bank No. 6 to dispose of produced salt water from its leases in the area. The subject well was drilled in March 2007 to a total depth of approximately 3,800 feet. The well has 328 feet of 8⁵/₈" surface casing cemented from the casing shoe to the ground surface. The well has 3,782 feet of 5¹/₂" casing, with top of cement calculated to be at 2,692 feet. A multi-stage tool is set at 1,339 feet and the 5¹/₂" casing is cemented from 1,339 feet to surface. The Texas Commission on Environmental Quality recommends that usable-quality ground water be protected to a depth of 1,275 feet, which is through the base of Wilcox sands. (See attached wellbore diagram).

The proposed disposal interval is the Woodbine Sand between 3,660 and 3,674 feet.

The proposed injection will be through 2⁷/₈" tubing set on a packer at 3,598 feet. The proposed maximum injection volume is 4,000 BWPD, with an estimated average of 500 BWPD. The proposed maximum injection pressure is 1,830 psig.

There are 4 wellbores within a ¼ mile radius of the proposed disposal well. One of the wells was plugged in 2005 and the other three are producing wells. Two of the producing wells are operated by Atlantis and produce from the Good Springs, W. (Woodbine) Field. The third producing well produces from the deeper Rodessa and is operated by Largo Oil Co. The plugged well is the Dorothy Brown No. 1. This well produced from the Woodbine and has a plug above the top of Woodbine and across the base of the useable quality water. The producing wells have casing cemented through the useable quality water. Additionally, there is a gross thickness of at least 2,000 feet of shale intervals between the proposed disposal interval and the base of useable quality water in this area.

This area of Rusk County is at the truncation point of the Woodbine and there are several dry holes in the area in which the Woodbine had been faulted out. Atlantis presented a cross-section indicating that Woodbine interval in the Moody No. 6 is composed of two separate sand members with a thin shale between the sands. Atlantis had tested the Moody No. 6 in the top member of the Woodbine with perforations from 3,651 to 3,653 with no oil produced and 60 BW. The proposed injection in the Moody No. 6 is into the lower Woodbine member.

The closest Woodbine producer to the Moody No. 6 is Atlantis' well to the northwest, the Kangerga No. 3R. The Woodbine in the No. 3R is a single thicker sand than found in the Moody No. 6. However, the log of the well indicates a lower resistivity in the lower portion of the sand, which Atlantis correlates to the proposed non-productive injection interval in its Moody No. 6. In November 2005, the No. 3R was completed in the upper portion of the Woodbine. The No. 3R continues to produce oil from the upper portion of the Woodbine. Atlantis interprets different oil-water contacts in these two wells. area wells and thus the Woodbine in the Moody No. 6 and the Kangerga No. 3R are not in communication. Atlantis further interprets different oil-water contacts in the Kangerga No. 3 and Rebel's Kangerga No. 1, both of which are located further to the west and northwest

of the Moody No. 6. The closest producing well operated by Rebel is the Kangerga No. 1 about 1,500 feet from the Moody No. 6. The log of the Kangerga No. 1 indicates that the Woodbine sand is broken up into at least two separate sand members. Atlantis therefore does not believe that the proposed injection will adversely affect the production of any producing wells in the field.

The Commission recently administratively approved an injection well permit for Gene Powell Investments, authorizing injection into the Good Springs, W. (Woodbine) Field in a well about 2,500 feet southeast from the Moody No. 6. Apparently this well has not yet been converted to an injection well.

Atlantis is currently hauling its produced salt water from area producing wells to a commercial facility, at a cost of \$20,000 to \$22,000 per month. Use of the proposed well will significantly decrease these disposal costs, resulting in additional recovery from the producing wells. All water would be piped from nearby wells to the No. 6 well for disposal.

Notice of the subject application was published in *The Kilgore News Herald*, a newspaper of general circulation in Rusk County, on August 10, 2007. A copy of the application was filed on July 27, 2007 with the Rusk County Clerk's Office. On July 27, 2007, a copy of the application was sent to all offsetting surface owners and all operators within ½ mile of the surface tract.

Atlantis has an active P-5 on file with the Commission, with \$50,000 financial assurance. There are no pending enforcement actions against Atlantis Oil Company, Inc.

Protestants' Evidence

Rebel and Powell both operate producing oil wells in the Good Springs, W. (Woodbine) Field. Both operators believe that the proposed injection will adversely affect their producing wells.

Cross-sections presented by protestants demonstrate the good correlation of the top of the Woodbine from well to well in field. Protestants interpret an oil-water contact at - 3,329 feet, which is confirmed by the recent logs of the Atlantis - Kangerga No. 3 and the Rebel - Kangerga Prior No. 2. In general, there is a thin oil column of 6-8 feet on top of a 20-30 foot water column. Because the Woodbine has a strong water drive, the producing wells are all perforated in the very top portion of the Woodbine. Protestants do not agree with Atlantis' opinion that the Moody No. 6 is not in communication with other wells producing from the field.

Powell's Haskins No. 1 well is about 10 feet structurally lower than the Moody No. 6. The Haskins No. 1 originally had 10 feet of oil column. Due to the rise in oil-water contact, this well produces at 94% water cut currently, from an oil column of only 1-2 feet. Powell is concerned that injection into the Woodbine in the Moody No. 6 will only result in wells being watered out sooner.

Rebel's Kangerga-Prior No. 2 was completed in January 2008 and produced 110 BOPD on initial test, water-free. This well is perforated about 4 feet above the oil-water contact and Rebel believes it will likely start producing water soon. Rebel asserts that the proposed injection into the Moody No. 6 would likely cause this well to prematurely water out.

Protestants examined production from six wells surrounding the Moody No. 6. These wells have produced almost 1 million BO since 1971. Cumulative production from the entire field is almost 3 million BO since 1970. It is estimated that remaining oil to be produced from the six surrounding wells is 750,000 BO. Protestants believe that these reserves will be at risk if the proposed injection is approved. Several wells produce with water cuts of more than 85%.

There are three active disposal wells in the subject field. In all three disposal wells, the gross Woodbine thickness is about three times more than in the Moody No. 6, which is only 22 feet. Additionally, the nearest producing well to any of the three other disposal wells is about 1,100 feet, compared to only 330 feet from the Moody No. 6 to the nearest producing well. The Basic Energy Services - H. D. Wood No. 1 is currently disposing of about 800 BWPD. Disposal is into the Woodbine about 67 feet below the oil-water contact. The Rebel Production - Tom Lacy No. 1D is currently disposing of about 750 BWPD, about 25 feet below the oil-water contact. The third well, the Palmer Petroleum - Lucy Padgett No. 1 is disposing of about 100 BWPD very near the oil-water contact in the Woodbine.

Atlantis requested a maximum disposal volume of 4,000 BWPD but estimates that average disposal will be about 500 BWPD. The thin disposal interval in the Moody No. 6, in conjunction with the large volume requested for disposal, causes serious concerns to both Rebel and Powell, especially compared to currently operating disposal wells in the field.

Protestants also have concerns that fluids injected into the Moody No. 6 will not be confined to the Woodbine. The Moody National Bank Gas Unit Well No. 2 is approximately 750 feet northwest of the Moody No. 6. The No. 2 produces from the Rodessa at about 6,900 feet. This No. 2 well does not have cement across the Woodbine interval. Any fluids which migrate through the Woodbine from the Moody No. 6 to the No. 2 would not be confined to the Woodbine.

Protestants indicated that their concerns would be lessened if the permitted volume were limited to 400 BOPD and the permitted injection pressure were limited to 1,500 psi.

EXAMINERS' OPINION

The examiners recommend approval of the application, with a limitation on the injection volume to 500 BWPD. The examiners agree with protestants interpretation that the reservoir has an oil-water contact at -3,329 feet and that all wells produce from a common reservoir. Atlantis' interpretation of different oil-water contacts in wells is not supported by the evidence.

Injecting large volumes of salt water into the Moody No. 6 at a point very near this contact may result in premature watering out of producing wells in the field, most of which are already at very high water cut. Atlantis requested a maximum volume of 4,000 BWP. The examiners recommend a maximum volume of 500 BWP, with a limitation that all injected water is from Atlantis' producing wells in the Good Springs, W. (Woodbine) Field. This limitation will prevent the oil-water contact from rising at an accelerated rate.

The Moody No. 6 is completed in a manner which will protect useable quality water resources and confine disposal fluids to the Woodbine. There is sufficient cement and casing to protect useable quality water. Additionally, there are several hundred feet of shale between the base of useable quality water and the top of the injection interval. There is sufficient cement (at least 600 feet) behind the long string above the injection interval to confine injected fluids to the Woodbine.

Protestant pointed out that there is one wellbore within ¼ mile, the Moody National Bank Gas Unit Well No. 2, which produces from the deeper Rodessa and does not have cement across the Woodbine interval. Protestants allege that this well will provide a conduit to allow injected fluids to migrate out the Woodbine in the No. 2 well. The examiners note that the annulus of the No. 2 well, though not cemented across the Woodbine, is filled with mud which will prevent upward migration behind pipe in that well. Again, with limited injection volume of only produced water, the pressure regime in the Woodbine in the area of the No. 2 well will not be affected.

Approval of the requested permit is in the public interest. It will provide Atlantis with an economical means of disposing of its produced water from the field, thereby extending the life of the producing wells, and preventing the waste of oil.

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 *Kilgore News Herald*, a newspaper of general circulation in Rusk County, on August 10, 2007. A copy of the application was filed on July 27, 2007 with the Rusk County Clerk's Office. On July 27, 2007, a copy of the application was sent to all offsetting surface owners and all operators within ½ mile of the surface tract.
2. The Moody National Bank Well No. 6 is cased and cemented in a manner to protect usable quality water.
 - a. The subject well was drilled in March 2007 to a total depth of approximately 3,800 feet.
 - b. The well has 328 feet of 8⁵/₈" surface casing cemented from the casing shoe to the ground surface.
 - c. The well has 3,782 feet of 5¹/₂" casing, with top of cement calculated to be at 2,692 feet. A multi-stage tool is set at 1,339 and the 5¹/₂" casing is cemented from 1,339 feet to surface.

- d. The Texas Commission on Environmental Quality recommends that usable-quality ground water be protected to a depth of 1,275 feet, which is through the base of Wilcox sands.
 - e. There is a gross thickness of at least 2,000 feet of shale intervals between the proposed disposal interval and the base of useable quality water in this area.
3. Fluids injected into the Moody National Bank No. 6 will be confined to the injection interval.
 - a. The proposed disposal interval is the productive Woodbine Sand between 3,660 and 3,674 feet.
 - b. The proposed injection will be through 2⁷/₈" tubing set on a packer at 3,598 feet.
 - c. Injection of only Atlantis' produced salt water from the Woodbine at a rate of no higher than 500 BWPD will not affect the pressure regime of the Woodbine in the Moody National Bank Gas Unit Well No. 2, which does not have cement across the Woodbine.
 4. Use of the Moody National Bank No. 6 to dispose of produced water from Atlantis' wells in the Woodbine is in the public interest to provide an economical means of disposal and extend the life of the producing wells operated by Atlantis, thereby preventing the waste of oil.
 5. Atlantis Oil Company, Inc. has an active P-5 on file with the Commission, with \$50,000 financial assurance.

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 as it will extend the life of producing wells and prevent the waste of oil.
4. The use or installation of the proposed injection well will not endanger or injure any oil, gas, or other mineral formation.
5. 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 can be adequately protected from pollution.

6. Atlantis Oil Company, Inc. has made a satisfactory showing of financial responsibility to the extent required by Section 27.073 of the Texas Water Code.
7. Atlantis Oil Company, Inc. has met its burden of proof and satisfied the requirements of Chapter 27.051 of the Texas Water Code and the Railroad Commission's Statewide Rule 46.

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.

Respectfully submitted,

Donna K. Chandler
Technical Examiner

Mark J. Helmueller
Hearings Examiner