



RAILROAD COMMISSION OF TEXAS

HEARINGS DIVISION

OIL AND GAS DOCKET NO. 8A-0290227

THE APPLICATION OF SATANTA OIL COMPANY FOR AN EXCEPTION TO STATEWIDE RULES 7 AND 13, O'BRIEN, J. C. LEASE (NO. 8A 66450), WELL NO. 1, BLEDSOE, NE. (FUSSELMAN) FIELD, COCHRAN COUNTY, TEXAS

HEARD BY: Paul Dubois – Technical Examiner
Marshall Enquist – Legal Examiner

HEARING DATE: September 18, 2014

APPEARANCES: **REPRESENTING:**

APPLICANT:

Carl Harman

Satanta Oil Company

EXAMINERS' REPORT AND RECOMMENDATION

STATEMENT OF THE CASE

Satanta Oil Company (Satanta) seeks exceptions to Statewide Rules 7 and 13 to bring the wellbore of its J.C. O'Brien Lease (No. 8A 66450), Well No. 1 (API No. 42-079-32441) into compliance with Commission rules. Satanta is the only operator in the Bledsoe, NE. (Fusselman) Field, and the O'Brien Well No. 1 is the only well in the field. Therefore, no other parties were entitled to notice of the application and hearing, and the matter was not protested.

Mr. Carl Harman, Manager of Operations, appeared at the September 18, 2014, hearing on behalf of Satanta. Mr. Harman described the situation of the subject well, but was not prepared to offer exhibits into evidence. The examiners outlined the information that would be needed for a sound recommendation, and Mr. Harman was given 30 days to provide the information in the form of late-filed exhibits. The exhibits were timely received on October 13, 2014. The examiners recommend that the requested exceptions be granted.

DISCUSSION OF THE EVIDENCE

The J. C. O'Brien Well No. 1 was drilled by Marshall R. Young Company in December 1989 as a wildcat to test the Fusselman Formation at a depth of about 10,400 feet. The well is the only well in the Bledsoe, NE. (Fusselman) Field (Field ID No. 08858 350). The well was drilled vertically and produced from an 18-foot perforated interval directly below a tight anhydrite streak capping the porosity of the Fusselman Formation. The well produced for 2 ½ years before watering out.

The O'Brien Well No. 1 was drilled about 490 feet from the apex of an anticlinal structure as determined from borehole seismic run during completion. The well was originally completed as follows:

- 13 7/8-inch surface casing set at 450 feet with cement circulated to the surface.
- 8 5/8-inch intermediate casing set at 4,125 feet with cement circulated to the surface.
- 5 ½-inch production casing set at 10,469 feet and cemented with a differential valve (DV) tool set at 6,049 feet. A cement bond log indicated the first stage top of cement to be at 9,330 feet, and the second stage top of cement to be at 5,430 feet.

Satanta obtained a groundwater protection letter from the Commission's Groundwater Advisory Unit on June 19, 2014, which stated the interval from the land surface to a depth of 350 feet must be protected. The surface and intermediate casing strings are set and cemented through this interval.

In January 2013 Satanta re-entered the wellbore to drill a sidetrack targeting a higher structural position on the anticlinal structure. The well was sidetracked from the vertical wellbore at a depth of 9,865 feet with a 4 5/8-inch hole. The sidetrack obtained a total measured depth of 10,569 feet. The sidetrack required reaming through the Woodford Shale interval due to sloughing. The well log through the 60-foot thick Woodford Shale Formation indicates high gamma ray readings in excess of 200 units. The caliper log also indicated highly variability in the Woodford, suggesting a tendency for the borehole to washout and possible instability.

A 4-inch liner was hung in the production casing at a depth of 9,378. There was only a 5/8-inch annulus between the liner and the sidetracked wellbore. The liner was not cemented through the sidetracked interval, leaving the sidetracked borehole open from the Fusselman Formation through the Woodford Shale and Mississippi Lime. On initial

potential testing the well produced 16 barrels oil, 1,000 cubic feet gas, and 24 barrels water.

Satanta filed well re-completion reports on the Commission's on-line completion system. Commission staff notified Satanta via the on-line completion system that the uncemented liner between the Fusselman, Woodford Shale, and Mississippi Lime Formations constituted a violation of Statewide Rule 7 (strata to be sealed off) and Statewide Rule 13 (casing, cementing, drilling, well control and completion requirements.)

Satanta is seeking exceptions to Statewide Rules 7 and 13 and for the re-completion to be approved. Satanta recognizes the re-completion is not in compliance with Rules 7 and 13. However, Satanta believes that the current completion will not harm hydrocarbon or freshwater resources, and remedial action may cause the waste of oil.

Resolving the issues would be technically complex. The sidetrack was drilled with a 4 5/8-inch hole and has been set with a 4-inch liner, leaving a 5/8-inch annulus. The total annular volume of the entire sidetrack is estimated to be about one cubic yard. In addition, the instability of the Woodford Shale would likely preclude the possibility of cement being pumped through this interval. Also, physical constraints would require the use of small tools and high risk.

The Commission's online geographic information system indicates there are no current or historical producing wells within a three mile radius of the O'Brien Well No. 1. The nearest production is from the Bonanza (San Andres) Field three miles to the south. The San Andres Formation is considerably shallower than the Fusselman Formation. Wells in the Bonanza (San Andres) Field are drilled to a total depth of about 5,000 feet; the top of the Fusselman was encountered in the O'Brien Well No. 1 at a depth of 10,416 feet. There is no production from the Woodford Shale or Mississippi Lime Formations in the area.

EXAMINERS' OPINION

To bring its O'Brien Well No. 1 into compliance with Commission Rules, Satanta seeks exceptions to Statewide Rules 7 and 13(b)(3)(B), which are as follows:

Rule 7: Whenever hydrocarbon or geothermal resource fluids are encountered in any well drilled for oil, gas, or geothermal resources in this state, such fluid shall be confined in its original stratum until it can be produced and utilized without waste. Each such stratum shall be adequately protected from infiltrating waters. Wells may be drilled deeper after encountering a stratum bearing such fluids if such drilling shall be prosecuted with diligence and any such fluids be confined in its stratum and protected as aforesaid upon completion of the well.

The commission will require each such stratum to be cased off and protected, if in its discretion it shall be reasonably necessary and proper to do so.

Rule 13 (b)(3)(B): *The production string of casing shall be cemented by the pump and plug method, or another method approved by the Commission, with sufficient cement to fill the annular space back of the casing to the surface or to a point at least 600 feet above the shoe. If any productive zone, potential flow zone and/or zone with corrosive formation fluids is open to the wellbore above the casing shoe, the casing shall be cemented in a manner that effectively seals off all such zones by one of the methods specified for intermediate casing in paragraph (2) of this subsection. A float collar or other means to stop the cement plug shall be inserted in the casing string above the shoe. Cement shall be allowed to stand under pressure for a minimum of eight hours before drilling the plug or initiating casing pressure tests. In the event that the distance from the casing shoe to the top of the shallowest productive zone, potential flow zone and/or zone with corrosive formation fluids make cementing, as required above, impossible or impractical, the multi-stage process may be used to cement the casing in a manner that will effectively seal off all such zones, and prevent fluid migration to or from such zones within the wellbore. Uncemented casing is allowable within a producing reservoir provided the production casing is cemented in such a manner to effectively isolate and seal off that zone from all other productive zones in the wellbore as required by §3.7 of this title (relating to Strata To Be Sealed Off).*

The examiners recommend Satanta be granted the requested exceptions and the current wellbore completion be approved as it will not harm hydrocarbon or freshwater resources in the area.

The O'Brien well is geographically isolated from any other producing wells by three miles. The nearest producing zones are in the San Andres Formation, which is about 6,000 feet above the top of the the Fusselman Formation, and about 5,000 feet above the cemented casing at the point of sidetrack. Further, groundwater resources above a depth of 350 feet require protection, and the existing wellbore contains three casing strings, two of which are cemented to the surface.

A remedial cementing job is an option, but the examiners agree with Satanta that the technical complexity, limited annual exposure, and existing isolation of the open interval to uphole zones reduce to nil the potential benefits of such a procedure.

FINDINGS OF FACT

1. Proper notice of this hearing was issued.

2. The J. C. O'Brien Well No. 1 is the only well in the Bledsoe, NE. (Fusselman) Field.
3. The O'Brien Well No. 1 was drilled in 1990 and was originally completed as follows:
 - a. 13 7/8-inch surface casing set at 450 feet with cement circulated to the surface.
 - b. 8 5/8-inch intermediate casing set at 4,125 feet with cement circulated to the surface.
 - c. 5 1/2-inch production casing set at 10,469 feet and cemented with a differential valve (DV) tool set at 6,049 feet. A cement bond log indicated the first stage top of cement to be at 9,330 feet, and the second stage top of cement to be at 5,430 feet.
4. The Commission's Groundwater Advisory Unit determined the interval from the land surface to a depth of 350 feet must be protected.
5. The O'Brien Well No. 1 was sidetracked and recompleted in 2013, resulting in the following liner and cementing conditions:
 - a. The well was sidetracked from the vertical wellbore at a depth of 9,865 feet with a 4 5/8-inch hole.
 - b. The sidetrack obtained a total measured depth of 10,569 feet.
 - c. The sidetrack required reaming through the Woodford Shale interval due to sloughing.
 - d. A 4-inch liner was hung in the production casing at a depth of 9,378.
 - e. There was only a 5/8-inch annulus between the liner and the sidetracked wellbore.
 - f. The liner was not cemented through the sidetracked interval, leaving the sidetracked borehole open from the Fusselman Formation through the Woodford Shale and Mississippi Lime.
 - g. On initial potential testing the well produced 16 barrels oil, 1,000 cubic feet gas, and 24 barrels water.

6. The current wellbore completion is in violation of Statewide Rule 7 as the productive Fusselman Formation is not isolated by casing and sufficient cement from the overlying formations.
7. The current wellbore completion is in violation of Statewide Rule 13(b)(3)(B) as the deepest casing shoe is not cemented to the appropriate depth above the producing interval.
8. The surface and intermediate casing strings are set and cemented through groundwater protection interval.
9. There are no current or historical producing wells within a three mile radius of the O'Brien Well No. 1.
 - a. The nearest production is from the Bonanza (San Andres) Field three miles to the south.
 - b. The San Andres Formation is considerably shallower than the Fusselman Formation. Wells in the Bonanza (San Andres) Field are drilled to a total depth of about 5,000 feet; the top of the Fusselman was encountered in the O'Brien Well No. 1 at a depth of 10,416 feet.
 - c. There is no production from the Woodford Shale or Mississippi Lime Formations in the area.
10. The current completion configuration will not harm hydrocarbon or freshwater resources.
11. The requested exceptions to Statewide Rules 7 and 13(b)(3)(B) will allow Satanta to continue producing its reserves in the Fusselman Formation.


CONCLUSIONS OF LAW

1. Resolution of the subject application is a matter committed to the jurisdiction of the Railroad Commission of Texas. Tex. Nat. Res. Code § 81.051
2. All notice requirements have been satisfied. 16 Tex. Admin. Code § 1.45
3. The existing casing configuration will prevent waste and protect correlative rights.

EXAMINERS' RECOMMENDATION

Based on the above findings of fact and conclusions of law, the examiners recommend that the Commission grant an exception to Statewide Rules 7 and 13(b)(3)(B) for the subject well, as requested by Satanta Oil Company.

Respectfully submitted,



Paul Dubois
Technical Examiner



Marshall Enquist
Legal Examiner