

**APPLICATION OF COMSTOCK OIL & GAS, L.P. TO DETERMINE UNDER STATEWIDE RULE 11(C)(1)(A) THAT THE PROPOSED COMPLETION LOCATION OF THE SHOVLIN-VEHLE LEASE WELL NO. 2, LAS HERMANITAS (HOUSE SAND) FIELD, DUVAL COUNTY, TEXAS IS REASONABLE AS DRILLED UNDER ITS EXISTING PERMIT (PERMIT No. 630118).**

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**APPEARANCES:**

David Gross  
Russ Sharp  
Mark Williams  
Rick Johnston

Davin McGinnis

**REPRESENTING:**

Comstock Oil & Gas, L.P.

Dominion Oklahoma Texas E&P Inc.

**EXAMINERS' REPORT AND RECOMMENDATION**

**PROCEDURAL HISTORY**

**NOTICE OF HEARING:**

April 16, 2007

**HEARING:**

May 24, 2007

**HEARD BY:**

Andres J. Trevino, Technical Examiner  
Marshall Enquist, Hearings Examiner

**RECORD CLOSED:**

May 31, 2007

**STATUS:**

Unprotested

**STATEMENT OF THE CASE**

Comstock Oil & Gas, L.P. (hereinafter "Comstock") seeks a determination pursuant to Statewide Rule 11(c)(1)(A) that the as drilled wellbore location for its Shovlin-Vehle Lease Well No. 2, Las Hermanitas (House Sand) Field, Duval County (hereinafter "Shovlin-Vehle No.2" and/or "subject well") is reasonable under the well's existing drilling permit. The minimum lease line spacing requirement is 467 feet. The subject well was permitted at a regular location 500 feet from the north line and 700 feet from the east line of Comstock's Shovlin-Vehle Lease under permit No. 630118 issued on December 19, 2006.

The Shovlin-Vehle No. 2 was the seventh well drilled in the immediate vicinity by either Comstock or its predecessor Denali Oil & Gas Management, LLC. Those six previous wells were drilled to comparable depths and all experienced very low angles of inclination. All aspects of the drilling program for the subject well (including bit selection,

downhole assemblies, rotational speed and weight on bit) were comparable to those of the previous wells. There were no geologic or subsurface factors that would suggest that the subject well would have encountered higher angles of inclination than those experienced by the previous wells.

The subject well was permitted to a total depth of 12,800 feet. During the first 8,500 feet of drilling it demonstrated extremely low angles of inclination. The inclination survey run at 8,585' indicated an inclination of 1.0 degree. The largest angle of inclination measured in the well up to that point had been only 1.5 degrees. From this point forward angles increased significantly. Subsequent inclination surveys showed angles increasing to 2.63, 3.75, 6.75 and 8.75 degrees. At a depth of 11,555 feet Comstock interrupted drilling and ran a directional survey to determine the actual wellbore location. The directional survey indicated that at a depth of 11,555 feet the well had drifted 328.30 feet to the north which would place it approximately 171 feet from the north lease line. The directional survey also revealed that at that depth the wellbore's azimuth was in a north-northeasterly direction with 8.60 degrees of inclination.

Acting upon the information obtained from the directional survey Comstock applied to the district office for authority to plug back to the previous casing depth and directionally drill the subject well back toward the permitted location. Directional drilling succeeded in reversing the well's direction of deviation from the north back toward the south and away from the nearest lease line. At the top of the Las Hermanitas (House Sand) completion interval the wellbore is approximately 322 feet from the north lease line; at the base of the completion interval the wellbore is approximately 454 feet from the north lease line. Upon completion of drilling Comstock set and cemented pipe and released the rig. Comstock has not made any attempt to complete the well.

Consistent with Rule 11(c)(1)(A), Comstock was instructed by Commission Staff to file for an amended as-drilled permit and advised that notice of application would be sent to the offset operators pursuant to Rule 37 reflecting the as-drilled location. Dominion E & P (hereinafter "Dominion") filed a protest of the Rule 37 exception application. Dominion maintains its protest of a Rule 37 exception permit for the subject well, but it does not protest or object to the Rule 11(c)(1)(A) reasonableness determination. Dominion appeared through counsel at the hearing.

The Examiners believe that the evidence shows Comstock engaged in reasonable and prudent efforts to steer the well to the permitted location after becoming aware that the well had unintentionally deviated to a location only 171 feet from the nearest lease line. The examiners recommend the as-drilled location be determined as reasonable and confirm that the subject well is in substantial compliance with the original drilling permit.

#### **DISCUSSION OF THE EVIDENCE**

The subject well was originally permitted in the Las Hermanitas (House Sand) Field

under Permit No. 630118 as a vertical well at a regular location 500 feet from the north lease line and 700 feet from the east lease line. Field rules required minimum lease line spacing of 467 feet. The nearest offsetting operator was Dominion. Dominion's offsetting Herbst-Torel Lease is 500 feet north of the permitted location.

The Shovlin-Vehle No. 2 was planned to be a vertical well drilled to a total depth of 12,800'. Six previous wells drilled to the Las Hermanitas (House Sand) Field on the adjoining Shovlin-Vehle "A" and Moore Leases experienced extremely low angles of inclination. Geologic and subsurface conditions did not suggest the subject well might experience higher inclination angles than those observed in the prior wells. A movement to the north, toward Dominion's offsetting Herbst-Torel Lease, would result in a loss of structure. There was no geologic advantage to be obtained by a movement to the north. The well's movement was unexpected and unintentional.

The Shovlin-Vehle No. 2 spud on January 14, 2007. The Form W-12 Inclination Report indicates very low angles of inclination down to the inclination survey taken at 8,585 feet. The twenty inclination surveys taken in the well to that point indicate an average angle of inclination of only 0.85 degrees. For reasons which are still unclear, between 8,585 feet and the next inclination survey taken at 9,084 feet the well's inclination increased from 1.0 degree to 2.63 degrees. Comstock monitored this increase in angle and took appropriate measures to return the well to vertical. These included lightening the weight on the drill bit and using a pendulum assembly. These measures appeared to have no effect. The next inclination survey taken at 9,828 feet showed an increase in angle to 3.75 degrees. Comstock continued to take industry-standard measures to reduce inclination angles and return the well to vertical. In addition to reducing weight on the drill bit and using a pendulum assembly, Comstock used a mud motor to increase rotary speed. Sections of hole were drilled and then redrilled with light weight and high rotary speed in an attempt to reduce inclination. Despite these measures subsequent inclination surveys showed that the well's inclination increased to 6.75 and then 8.75 degrees. At this point it was clear that additional action was required.

All of the inclination data obtained to this point was random inclination data; Comstock did not know the actual location of the wellbore. However the rapid increase in inclination alerted it to the fact that the wellbore might have moved to a location substantially closer than 467' to the lease boundary. Comstock calculated a "worst case" scenario to identify how close the well might be to the Shovlin-Vehle lease boundary. This calculation assumed that all of the inclination occurred in the direction of the nearest lease line. It revealed that there was a possibility that the well was substantially closer to the nearest line than permitted, and that if high angles of inclination persisted the well might actually cross the lease line before reaching Total Depth of 12,800 feet. Based upon this information Comstock interrupted drilling at an approximate depth of 11,555 feet and ran a directional survey to determine the well's location at that point.

At 11,452 feet the total Accumulative Displacement for the well was 425.75 feet.

This total of the W-12 inclination did not necessitate the running of a directional survey. Comstock's careful monitoring of inclination angles, and the realization that the well might experience significant displacement, prompted it to interrupt drilling before reaching Total Depth, and to run a directional survey. That survey revealed that at 11,555 feet the well had moved some 328.30 feet toward the north. This would mean that with roughly 1,245 feet of drilling remaining the well was only 171 feet from the north lease line. The directional survey also revealed that the well's inclination angle at that depth was 8.60 degrees in a north-northeasterly direction. The well's inclination and path would only bring it closer to the nearest lease boundary as it drilled to Total Depth.

The information obtained from the directional survey made it clear to Comstock that the only way to drill a compliant wellbore would be to intervene and drill directionally to steer the well back toward the permitted location. Comstock contacted the Railroad Commission District 4 Office in Corpus Christi and obtained authority to plug back to the previous casing depth and directionally drill the well. At this point the well had been drilled to a depth of 11,555 feet. Comstock went back up the hole roughly 1,000 feet and spotted a cement plug. It then kicked out at a depth of 10,530 feet and began directional drilling. The first bit used was unable to reverse the well's direction. At 10,724 feet bits were changed and the well started to respond. Comstock was able to successfully reverse the well's direction of movement from north to south, away from the nearest lease line.

While drilling directionally Comstock used a measurement while drilling tool ("MWD") to continuously monitor the well's location. Comstock successfully steered the well to the south and away from the nearest lease boundary. Recall that at a depth of 11,555 feet the original directional survey revealed that the well was only 171 feet from the north lease line. The thickness of the well's vertical completion interval is roughly 900 feet ranging from a measured depth of approximately 11,750 feet to 12,658 feet. At the top of the Las Hermanitas (House Sand) Field pay at 11,750 feet the wellbore is approximately 322 feet from the north lease line. Through the completion interval the well continued on its southern orientation. At the base of the deepest potential pay at 12,658 feet the well is 436 feet from the north lease line. Comstock's incremental costs incurred in the directional drilling of the well totaled approximately \$850,000.00.

At its closest point within the Las Hermanitas (House Sand) Field completion interval the wellbore is 322 feet from the north lease line. At the base of the deepest potential pay the wellbore is 436 feet from the north lease line. The total displacement of the well was approximately 178 feet from the permitted location and 145 feet from the minimum lease line spacing distance. Comstock submits that the as drilled wellbore location is reasonable and in substantial compliance with the well's original permit based upon the TD for the well and the actions taken by Comstock to drill the well to the permitted location. A copy of Comstock Exhibit 13 showing the wellbore trajectory and drilling information is attached for reference as Attachment A.

**EXAMINERS' OPINION**

Statewide Rule 11(c)(1)(A) provides:

When the maximum displacement indicated by an inclination survey is greater than the actual distance from the surface location to the nearest lease line or pooled unit boundary, it will be considered to be a violating well subject to plugging and to penalty action. However, an operator may submit a directional survey, run at his own expense by a commission approved surveying company, to show the true bottom hole location of the well to be within the prescribed limits. When such directional survey shows the well to be bottomed within the confines of the lease, but nearer to a well or lease line or pooled unit boundary than allowed by applicable rules, or by the permit for the well if the well has been granted an exception to §§3.37 of this title (relating to Statewide Spacing Rule), a new permit will be required if it is established that the bottom hole location or completion location is not a reasonable location.

The examiners are of the opinion that the Shovlin-Vehle No. 2 as-drilled bottom hole location is reasonable and the well is in substantial compliance with the original permit. The deviation of the wellbore was unexpected and does not appear to be intentional. Comstock acted in a reasonable and prudent fashion in monitoring the well's inclination and attempting to steer the well back to the original permitted location after it discovered the well had moved toward the lease line. Accordingly, the examiners believe that the as-drilled location is reasonable and in substantial compliance with the original permit.

#### **RECOMMENDATION**

Based on the evidence in this record the examiners recommend that the following findings of fact and conclusions of law be adopted.

#### **FINDINGS OF FACT**

1. All interested parties received at least 10 days notices of this hearing. Applicant Comstock Oil & Gas, L.P. (hereinafter "Comstock") appeared at the hearing and presented evidence. Offset operator Dominion E & P, Inc. (hereinafter "Dominion") appeared at the hearing and stated that it did not object to or protest Comstock's application for a Rule 11(c)(1)(A) reasonableness determination.
2. The Las Hermanitas (House Sand) Field is subject to lease line spacing requirements of 467 feet and between well spacing requirements of 1,200 feet.
3. The Shovlin-Vehle No. 2 was permitted as a vertical well at a regular location 500 feet from the north lease line and 700 feet from the east line of the lease. The well

was spudded on January 14, 2007, and the drilling rig was released on February 27, 2007. The well has not been completed and it has not produced. Comstock filed a "well record only" completion report for the well.

4. The directional survey run on the sidetracked hole shows that at the top of the completion interval the well is 322 feet from the nearest lease line; at the base of the completion interval the well is 436 feet from the nearest lease line.
5. The Commission's Proration Engineer advised Comstock to file an amended Commission Form W-1 (Application for Permit to Drill, Recomplete or Re-Enter) for the as-drilled location. Comstock complied with that instruction. Comstock also filed a request for a hearing to determine that the location of the as-drilled wellbore is reasonable and in compliance with Permit No. 630118 pursuant to Statewide Rule 11(c)(1)(A).
6. Comstock's geologic interpretation showed that dip in the area of the Shovlin-Vehle No. 2 in the House R Sand was approximately 5 to 6 degrees toward the north. The well location was chosen in order to be reasonably close to a bounding fault to the south, while at the same time optimizing structure. A movement of the wellbore toward the north would have resulted in a loss of structure. There was no geologic or other advantage to be gained with a northerly movement of the well location. The deviation experienced by the well was unintentional and unexpected.
7. The area described in Comstock's geologic interpretation included six other Comstock wells that were drilled to depths comparable to that of the Shovlin-Vehle No. 2. All of those wells were drilled under comparable drilling programs and experienced very low angles of inclination. There were and are no known geologic or technical factors which explain why the Shovlin-Vehle No. 2 experienced significantly higher inclination than the prior wells.
8. Comstock engaged in reasonable and prudent operations to steer the well to the permitted location after discovering it had deviated toward the nearest lease line.
  - A. Comstock anticipated that the well would drill with very low angles of inclination, in the same manner as its six other wells on the adjoining Shovlin-Vehle "A" and Moore Leases.
  - B. The well's permitted Total Depth was 12,800 feet. During the first 8,585 feet of drilling the well's average angle of inclination was less than one degree, with no individual angle higher than 1.50 degrees. During the course of drilling from 8,585 feet to 11,555 feet inclination angles increased significantly from 2.63 degrees to as high as 8.75 degrees. During this drilling Comstock utilized standard drilling techniques to attempt to reduce inclination and return the wellbore to vertical. These included the use of a pendulum assembly,

reduction in weight on the drill bit, use of a mud motor to increase bit speed, and drilling and then re-drilling sections of hole in an effort to reduce inclination. These measures resulted in a dramatically reduced penetration rate, but the inclination surveys indicated that they were not effective in reducing inclination angles.

- C. Due to the build up in angle, Comstock ran a directional survey to determine the actual location of the well. It revealed that at a depth of 11,555 feet the well had moved 328.30 feet toward the north, such that it was only 171 feet from the north lease boundary.
- D. Informed of the well's actual location only 171 feet from the north lease line, Comstock contacted the District Office and obtained authority to directionally drill the well back to the permitted location.
- E. Comstock spotted a cement plug in the wellbore and then kicked out just below the base of the 7 5/8" drilling liner at a depth of 10,530 feet and began drilling directionally. Initially the well did not respond, but a bit change at 10,724 feet proved effective in reversing the well's northern orientation.
- F. Comstock successfully steered the well so that it was now moving toward the south, back away from the nearest lease line.
- G. At the top of the completion interval the wellbore is 322 feet from the nearest lease line; at the base of the completion interval the wellbore is 436 feet from the nearest lease line. At the top of the completion interval total displacement is approximately 178 feet; at the base of the completion interval total displacement is approximately 64 feet.
- H. Comstock incurred incremental costs of approximately \$850,000 attempting to steer and direct the well to the permitted location.

#### CONCLUSIONS OF LAW

1. The subject application on Commission Form W-1 was properly filed.
2. Proper notice of hearing was timely given to all persons legally entitled to notice.
4. All things have been done and have occurred to give the Commission jurisdiction to decide this matter.
5. The as drilled wellbore location of the Shovlin-Vehle No. 2 well as shown by the directional survey is reasonable under the circumstances encountered during drilling

operations, given the actions taken by Comstock and the total depth of the well.

6. The Shovlin-Vehle No. 2 well is in substantial compliance with the original permit application.

**RECOMMENDATION**

The examiners recommend that the attached Final Order be entered finding:

1. The as drilled wellbore location for the Shovlin-Vehle No. 2 well is reasonable; and
2. The Shovlin-Vehle No. 2 well as drilled is in substantial compliance with the original drilling permit; and,

Respectfully submitted,

Andres J. Trevino  
Technical Examiner

Marshall Enquist  
Hearings Examiner