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HEARINGS DIVISION

OIL AND GAS DOCKET NO. 08-0278209

APPLICATION OF APACHE CORPORATION TO ADOPT FIELD RULES FOR THE THREE BAR (WICHITA) FIELD, ANDREWS COUNTY, TEXAS

HEARD BY: Andres J. Trevino, P.E. - Technical Examiner
Michael Crnich- Legal Examiner

HEARING DATE: September 28, 2012

APPEARANCES:	**REPRESENTING:**
APPLICANT:	
Brian Sullivan P.E.	Apache Corporation
Dean Snidow	
Kevin Alexander	
Benjamin Kimbrough	

EXAMINER'S REPORT AND RECOMMENDATION

STATEMENT OF THE CASE

Apache Corporation requests that field rules for the Three Bar (Wichita) Field be adopted. The field is currently governed by Statewide Rules that provide for 467'-1,200' well spacing, 40-acre density, and general vertical well development rules. Apache requests that field rules be adopted because field development with horizontal wells is anticipated. Apache proposes the following rules for the field:

1. Designation of the field as the correlative interval from 6,830 feet to 7,685 feet as shown on the log of Apache Corporation's University AD, Well No. 6;

2. 330'-0' well spacing, 100' dual lease line spacing, take points, no perf zones, 50 foot box rule, and off lease penetration;

3. 80-acre oil units with no maximum diagonal, no individual proration plats;

4. Allocation based on 100% acreage;

5. Stacked lateral rules.

Apache Corporation proposed a Gas-Oil Ratio Rule for the field in the Notice, but at the hearing determined the request was an error. Apache withdrew their request for a Gas-Oil Ratio Rule.

The examiners recommend that field rules for the Three Bar (Wichita) Field be amended as proposed by Apache Corporation.

DISCUSSION OF THE EVIDENCE

The Three Bar (Wichita) Field was discovered in 1972 at approximately 7,192' subsurface depth. The field operates under Statewide rules. There are two operators and nine wells on the current proration schedule but only five are active. Additionally, Apache has drilled four horizontal wells in the field that are not yet on the current proration schedule. The field has produced 149.8 MBO and 149.8 MMCF of casinghead gas.

The Three Bar (Wichita) Field is not a stand alone field, as vertical wells rarely produce sufficient hydrocarbons to justify drilling a vertical well. Wells are typically completed in the deeper Three Bar (Devonian) Field at a depth of 8,100 feet and are produced until depletion. The wells are later recompleted into the Wichita to recover existing reserves there. A vertical completion generally has an initial production rate of 13 BOPD and recovers a maximum of 21,000 BO. A horizontal completion, the Three Bar Shallow Unit Well No. 101H had an initial production rate of 900 BOPD and is estimated to recover 248 MBO. Apache is amending the existing field rules in the Three Bar (Wichita) Field to adopt horizontal rules to allow efficient and orderly development of the Three Bar (Wichita) Field with horizontal wells. Currently the field rules only provide for vertical well development. The proposed horizontal rules are similar to horizontal rules found in other fields being developed with horizontal wells in the State.

Apache requests that the field be designated as the correlative interval from 6,830 feet to 7,685 feet as shown on the log of Apache Corporation's University AD, Well No. 6. This interval includes the Upper Wichita Albany pay and the Lower Wichita Albany pay zone. The Wichita Albany is a shallow marine carbonate composted of dolomite with some limestone deposited in a restricted platform environment. The Wichita Albany interval is 855 feet thick with a calculated permeability of 0.4 millidarcy. The Upper Wichita Albany net pay is approximately 41 feet thick. The Lower Wichita Albany net pay is approximately 45 feet thick. The Upper and Lower zones are vertically separated by 400 feet. Due to the 400 feet of vertical separation there is a need for multiple stacked laterals to effectively recover the hydrocarbons. In addition there is a high-stress limestone interval that acts like a barrier within the Upper Wichita Albany zone that separates internal zones 1 and 2 from zone 3 in the Upper Wichita Albany pay zone.

Apache requests adoption of 330' lease line spacing, 0' between-well spacing and dual lease line spacing to be consistent with the spacing rules of other fields being

developed with horizontal wells. Apache is requesting a spacing rule requiring a minimum of 100 feet to the lease line from the first and last take points of a horizontal drainhole, with 330 feet from lease lines on all points on the drainhole perpendicular to the lease line. The 100-foot lease line spacing for the first and last take points allows maximum recovery from the reservoir by maximizing reservoir contact. Apache estimates each foot of lateral will recover 47 BO. A well drilled with the first and last take points at 100 feet versus 330 feet will have a lateral 460 feet longer. That well will recover an estimated 21,620 BO. The 0' between-well spacing will allow the drilling of horizontal wells in between the numerous existing vertical wells to maximize oil recovery.

Apache requests several other standard provisions that are commonly adopted when horizontal well development is anticipated. The provisions include take point language to allow flexible drilling of the laterals and off-lease penetration to allow the additional recovery of reserves by allowing the lateral to be horizontal at a legal lease line location. Off-lease penetration will allow increased hydrocarbon recovery as the lateral will make greater contact with the formation as the well is turned from vertical to lateral adjacent to the lease. Off-lease penetration will allow the first take point to be closer to the lease line. Apache estimates each foot of lateral will recover 47 BO. For a well drilled off-lease, an additional 600 feet of reservior contact will be made. With the extra 600 feet of lateral, the well will recover an estimated additional 28,000 BO that would otherwise go unrecovered.

Apache proposes that the standard 40-acre density be increased to 80-acre density for oil wells. Most vertical wells are believed to drain 40 acres. A study of the decline type curves for all wells completed in the Wichita Albany zone shows the typical vertical well will have an initial production rate of 13 BOPD, level out at 3 BOPD, and produce 21,000 BO. The Merlot, Well No.1 operated by Oxy had an initial potential of 25 BOPD, had level production of 10 BOPD, and will drain in excess of 40 acres but less than 160 acres.

The gross thickness of the Wichita Albany in this field is 855 feet. The interval has both an Upper and Lower Wichita Albany that are separated by 400 feet and will support “stacked” horizontal drilling in each zone. Amending the rule as proposed will allow stacked lateral drainholes to be simultaneously drilled from multiple surface locations. The stacked lateral rules also require that each point of a stacked lateral horizontal drainhole be no more than 300 feet in a horizontal direction from any point along any other horizontal drainhole of the same stacked lateral well. Other horizontally developed fields that have thick intervals adopt stacked lateral rules.

Apache proposes a 50-foot “box rule” for horizontal drainhole wells that would allow drainholes to deviate 50 feet from either side of their permitted track without the necessity of obtaining a Statewide Rule 37 exception. Apache requests that the allocation formula for the field remain unchanged.

FINDINGS OF FACT

1. Notice of this hearing was given to all operators of wells in the Three Bar (Wichita) Field at least ten days prior to the date of hearing.

2. The Three Bar (Wichita) Field was discovered in 1972 at approximately 7,192' subsurface depth.

3. There are two operators and nine wells on the current proration schedule but only five are active. The field has produced 149.8 MBO and 149.8 MMCF of casinghead gas.

4. The field operates under Statewide rules. Apache has drilled four horizontal wells in the field that are not yet on the current proration schedule. There are currently no rules for horizontal drilling.

5. The entire correlative interval 6,830 feet to 7,685 feet as shown on the log of Apache Corporation's University AD, Well No. 6. should be designated as the Three Bar (Wichita) Field. The interval includes the Upper Wichita Albany pay and the Lower Wichita Albany pay zone.

6. Field rules that provide for 330-foot lease line spacing, zero between-well spacing for all wells in the field, take point language, off-lease penetration, and a "box rule" for horizontal wells will provide consistency with other fields undergoing horizontal drilling.

7. Allowing 100-foot lease line spacing for the first and last take points allows maximum recovery from the reservoir by maximizing reservoir contact. Apache estimates each foot of lateral will recover 47 BO. A well drilled with the first and last take point at 100 feet versus 330 feet will have a lateral 460 feet longer. Each well will recover an estimated additional 21,620 BO.

6. Allowing off-lease penetration will allow an additional reservoir contact on each lateral causing the recovery of additional reserves that would otherwise be left in the ground. With the extra 600 feet of lateral, a well will recover an estimated additional 28,000 BO.

7. The proposed 50-foot "box rule" is necessary to allow operators reasonable minor deviations from the wellbore track that has been permitted.

8. Adoption of 80-acre density for oil wells in the field is appropriate.

    a. Most vertical wells are believed to drain 40 acres. A study of the decline type curves for all wells completed in the Wichita Albany zone

shows the typical vertical well will have an initial production rate of 13 BOPD, level out at 3 BOPD, and produce 21,000 BO.

b. The Merlot, Well No.1 operated by Oxy had an initial potential of 25 BOPD, had a level production of 10 BOPD, and will drain in excess of 40 acres but less than 160 acres.

9. Given that the gross thickness of the Wichita Albany in this field is 855 feet, multiple stacked laterals will be required to fully develop the reservoir. The interval has both an Upper and Lower Wichita Albany that are separated by 400 feet and will support “stacked” horizontal drilling in each zone.

10. Allocation based on 100% acreage will remain unchanged and is a reasonable formula which will protect correlative rights of mineral owners in the field.

CONCLUSIONS OF LAW

1. Proper notice of this hearing was given to all persons legally entitled to notice.

2. All things have occurred or been accomplished to give the Railroad Commission jurisdiction in this matter.

3. Adopting permanent field rules as proposed by Apache Corporation is necessary to prevent waste and protect correlative rights.

EXAMINERS’ RECOMMENDATION

Based on the above findings and conclusions, the examiner recommends that field rules be permanently adopted for the Three Bar (Wichita) Field to reduce lease line spacing to 330 feet, eliminate between-well spacing for all wells, add take points, allow off-lease penetration, add a 50 foot “box” rule, and add stacked-lateral rules.

Respectfully submitted,

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Technical Examiner

Michael Crnich
Legal Examiner