

March 9, 2002

OIL AND GAS DOCKET NO. 03-0230586

THE APPLICATION OF KERR-MCGEE ROCKY MOUNTAIN CORPORATION TO ADOPT RULES AND PERMANENTLY CLASSIFY THE PORT ACRES (HACK. 9600) FIELD AS A GAS FIELD, JEFFERSON COUNTY, TEXAS

Heard by: Margaret Allen, Technical Hearings Examiner

Procedural history

Application received: February 4, 2002

Hearing held: March 8, 2002

Appearances

Greg Cloud

Representing

Kerr-McGee Rocky Mountain Corp.

EXAMINER'S REPORT AND RECOMMENDATION

STATEMENT OF THE CASE

Kerr-McGee Rocky Mountain Corporation is seeking to have the Port Acres (Hack. 9600) Field permanently classified as a gas field. It is also seeking to adopt the following two rules:

1. Designated interval from 9522' to 9614' as shown on the log of the Wingate Lease Well No. 1; and
2. allocation based 75% on deliverability and 25% per well.

Kerr-McGee would also like to have the overproduction of the discovery well canceled.

DISCUSSION OF THE EVIDENCE

The Port Acres (Hack. 9600) Field is a non-associated gas field discovered in January of 2000, with the completion of the Kerr-McGee's Wingate Well No. 1. This well was perforated from 9600 to 9603 feet upon completion and tested at a maximum rate of 5506 MCF/D. In April, 2000, perforations in another sand, between 9526' and 9532' were added. The well has already produced 3.3 BCF and over 32,000 barrels of condensate.

Both sandstones are part of the Hackberry, a deep Frio section, and are separated by about 30 feet of shale. Because the two sandstones are separated, a two-factor allocation formula is necessary for statutory reasons. One based 75% on deliverability and 25% per well is similar to Statewide Rules and will satisfy the statutory requirement.

Commission guidelines for gas classification of wells with a gas/oil ratio of less than 100,000 cubic feet per barrel include API gravity of at least 50 degrees, a boiling point of less than 520 degrees at 80% recovery and an end point of less than 720 degrees. The Form G-5 distillation data filed for Well No. 1 indicate that the well had a boiling point of 600 degrees at 80% recovery and a liquid gravity

of only 42.3 degrees API.

Kerr-McGee submitted a PVT analysis to the Commission to support classification of its Wingate Well No. 1 as a gas well. Based on the PVT data, the well was classified as a gas well, subject to review by the Commission at a later date. Kerr-McGee requested this hearing in order to have the well and field permanently classified as gas-producing. Otherwise, Commission staff would reclassify the discovery well to an oil well when the reservoir pressure depleted. The initial reservoir pressure was reported to be 7500 psi and the initial gas/oil ratio was 61,500 cubic feet per barrel.

The sample for the PVT analysis of Well No. 1 was taken from the well on March 17, 2000. A fluid sample was recombined at the reservoir temperature of 206°F and reservoir pressure of 7500 psig. The recombined fluid was evaluated at various pressures. The reservoir fluid was single phase gas until the reservoir pressure reached 2769 psig (the retrograde dew point pressure), when small amounts of liquid began to condense from the gas.

The gas-liquid ratio in the reservoir fell below 100,000 cubic feet per barrel when the reservoir pressure fell below 1500 psig. At 1,500 psig, the gas-liquid ratio was approximately 106,000 cubic feet per barrel in this reservoir, and at 1250 psig, the gas-liquid ratio in the reservoir would be 98,232 cubic feet per barrel. The highest percentage of liquid in the reservoir, 1.3%, would be reached when the bottomhole pressure declined to 1000 psi.

It is widely accepted that oil in a reservoir is essentially immobile until it reaches a saturation of 10 to 20%¹. Kerr-McGee believes all of its wells should continue to be permanently classified as gas wells because the small volume of liquid in the reservoir below approximately 3800 psig is not mobile and will not be recovered as liquid.

Statewide Rule 79 defines a gas well as:

....a well which produces hydrocarbon liquids, a part of which is formed by a condensation from a gas phase and a part of which is crude petroleum oil, shall be classified as a gas well unless there is produced one barrel or more of crude petroleum oil per 100,000 cubic feet of natural gas; and that the term "crude petroleum oil" shall not be construed to mean any liquid hydrocarbon mixture or portion thereof which is not in the liquid phase in the reservoir, removed from the reservoir in such liquid phase, and obtained at the surface as such.

Kerr-McGee believes that because the liquid hydrocarbons in the reservoir are immobile, the liquid produced at the surface does not meet the definition of 'crude petroleum oil'. Instead, the produced liquid is a product of condensation and should not be used as a basis for classification of the well as an oil well.

Kerr-McGee has also requested cancellation of the overproduction this well accrued when the operator did not file the required tests. Overproduction of 273 MMCF occurred between November 1, 2001 and March 1, 2002. The current G-10 shows the reservoir pressure still above the dew point.

¹ Craft and Hawkins, 1954, *Applied Petroleum Reservoir Engineering*

Water production is increasing and is now over 100 barrels per day. This is the only well in the field and cancellation of the overproduction will not harm correlative rights.

EXAMINER'S OPINION

The examiner recommends that the application be approved for the Kerr-McGee Wingate No. 1. This well produces from a retrograde condensate reservoir which is initially a single-phase gas reservoir. At some time during the life of the field, liquid hydrocarbons will exist in the reservoir at a ratio of less than 100,000 cubic feet per barrel. However, the liquid hydrocarbons will be present at a maximum volume of 1.32% of the hydrocarbon pore space. Such a low volume is immobile, according to published literature which states that liquid saturations must be in the range of 10 to 20% before the hydrocarbon liquids in the reservoir become mobile. Therefore, any liquid hydrocarbons produced at the surface have condensed from the gas and do not meet the statutory definition of crude petroleum oil. The condensed liquids should not be considered in determining the gas-oil ratio because the liquids produced at the surface are not crude petroleum oil. The well should be permanently classified as a gas well.

FINDINGS OF FACT

1. Notice of this hearing was given to all operators and interest owners in the Port Acres (Hack. 9600) Field on February 19, 2002.
2. The Kerr-McGee Rocky Mountain Corporation Wingate Lease Well No. 1 was completed in the Port Acres (Hack. 9600) Field in November, 1999, and was initially classified as a gas well based on PVT analysis.
3. The discovery well is the only well in the subject field and it is perforated from 9600 to 9604 feet, and from 9526 to 9532 feet, in two different sandstones of the Hackberry.
4. The productive Hackberry formation extends from 9522 feet to 9614 feet, as shown on the log of the Kerr-McGee Rocky Mountain Corporation Wingate Lease Well No. 1.
5. A two-factor allocation formula is necessary for statutory reasons due to the multiple reservoirs within the designated interval.
6. A formula based 25% per well and 75% on deliverability is close to the Statewide allocation formula, and will satisfy the statutory requirements.
7. The discovery well produces from a retrograde condensate gas reservoir with a dew point pressure of 2769 psig.
8. A PVT analyses indicate that the gas-liquid ratio in this reservoir will decrease to less than 100,000 cubic feet per barrel as the reservoir is depleted.
9. The gas-liquid ratio will be less than 100,000 cubic feet per barrel when the reservoir of the Wingate Well No. 1 reaches a pressure between 1500 and 1250 psig.

10. The small volume of liquid in the reservoir (less than 10%) is not mobile and will not be produced at the surface as a liquid.
11. The maximum percentage of hydrocarbon pore space occupied by retrograde liquid in Well No. 1 will be 1.3% when the pressure in this reservoir reaches 1000 psig.
12. Liquid hydrocarbons produced at the surface from this reservoir are the product of condensation and should not be classified as crude petroleum oil.
13. Because no crude petroleum oil is produced from this reservoir and never will be produced from the Kerr-McGee Wingate Well No. 1, wells in the Port Acres (Hack 9600) Field should be classified as gas wells.
14. Cancellation of overproduction for the only well in the Port Acres (Hack 9600) Field will not harm correlative rights.

CONCLUSIONS OF LAW

1. Proper notice was given as required by statute.
2. All things have been done or occurred to give the Railroad Commission jurisdiction to resolve this matter.
3. The Kerr-McGee Rocky Mountain Corporation Wingate Well No. 1 in the Port Acres (Hack. 9600) Field is completed in a gas reservoir based on the definition of a gas well pursuant to Statewide Rule 79(a)(11)(C).
4. The proposed field rules will satisfy statutory requirements and promote orderly development of the reservoirs.

EXAMINER'S RECOMMENDATION

Based on the above findings and conclusions, the examiner recommends that the Port Acres (Hack 9600) Field be permanently classified as a gas field, and that the proposed field rules be adopted.

Respectfully submitted,

Margaret Allen
Technical Hearings Examiner