

**RAILROAD COMMISSION CALLED HEARING TO DETERMINE THE EFFECTIVENESS OF THE FIELD RULES FOR THE KEYSTONE (ELLENBURGER) FIELD, WINKLER COUNTY, TEXAS**

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**Heard by:** Donna Chandler, Technical Examiner

**Hearing Date:** March 3, 2010

**Appearances:**

Bob Grable  
David Nelson  
Steve Neuse  
Michael Lyon

James Smith

**Representing:**

BOPCO, L.P.

Devon Energy Corp.

**EXAMINERS' REPORT AND RECOMMENDATION**

**STATEMENT OF THE CASE**

The Keystone (Ellenburger) Field operates under special field rules which dictate a reservoir management plan designed to maximize oil recovery from the field. Rules were originally adopted in 1992 and have been amended on several occasions during Commission called review hearings. The most recent revisions were adopted in Final Order No. 08-0230429, approved by the Commission on November 13, 2002. A review hearing was held in January 2005 but no changes to the rules were made at that time. The current rules are summarized as follows:

1. Base reservoir gas allowable (BRGA) of 24,750 MCFD, assignable only if the total field water production disposed of elsewhere exceeds 13,000 BWPD;
2. Gas allowable credit of 275 SCF/BW removed from the reservoir and disposed of elsewhere;
3. Maximum field water production eligible for gas credit is 90,000 BWPD;

4. BRGA and water credit distribution is 46.55% to Devon and 53.45% to BOPCO.

BOPCO and Devon are the only operators in the field and believe that the current rules should be amended slightly and reviewed again in 3 years.

The examiner recommends approval of Bass and Devon's request.

### **DISCUSSION OF THE EVIDENCE**

The original oil-water contact in the Keystone (Ellenburger) Field was at -7,150 feet at discovery in 1943. The original gas-oil contact was at -6,565. By the early 1990's, after the production of 146 million BO and 277 BCF of gas, there was no discernable oil-water contact, but the gas-liquid contact in the reservoir had risen significantly up into the original gas cap. The Commission adopted a reservoir management plan for the field in an effort to reverse the upward movement of the aquifer into the gas cap. The field rules were amended on several occasions as the gas-liquid contact was monitored. With a change in the rules for gas production in 1997, the rise in the contact was halted. In 2001, the contact was lowered as a result of Bass increasing water production from the field. By 2002, the contact began to slowly rise again until the field rules were again amended to provide for increased water production and less gas allowable credit. Since the last field rules change, the gas-liquid has dropped from -6,280 feet to -6,425 feet. The reservoir management plan is accomplishing the goal of recovering additional oil from the field, but the contact is still about 140 feet above the original gas-oil contact.

The changes in field rules over the years demonstrate that very small changes in water and gas production can have significant effects on the movement of the gas-liquid contact. When the gas allowable credit was 300 SCF/BW for several years, the contact moved slowly upward. When the credit was reduced to 275 SCF/BW in 2003, the contact moved back down. No change is sought to the gas allowable credit.

There are a total of 61 wells producing from the Keystone (Ellenburger) Field, including 25 wells on submersible pumps which move large volumes of fluid. Daily production from the field is a total 200-300 BOPD, 20 MMCFD and 80,000 BWPD. Cumulative production from the field is 148.9 million BO and 643.6 BCF of gas. Total gas injected is 205 BCF. Approximately 3.7 million BO has been recovered as a result of the reservoir management plan.

In the last several years, operators have not been able to attain the 90,000 BWPD withdrawals due to operational and wellbore issues. On this basis, it is requested that the maximum field water production eligible for gas allowable credit be reduced to 76,500 BW per month. Retaining the 275 SCF/BW produced results in a base reservoir gas allowable of 21,038 MCFD, down from 24,750 MCFD. Each operator's percentage of production should not be modified, but the volumes are reduces to 11,521 MCFD for Devon and 13,229 MCFD for BOPCO.

**FINDINGS OF FACT**

1. Notice of this hearing was given to all parties entitled to notice at least ten days prior to the date of hearing.
2. Since 1992, The Keystone (Ellenburger) Field has operated under a reservoir management plan designed to lower the gas-liquid contact in the reservoir and maximize oil recovery from the field.
3. The current rules provide for a base reservoir gas allowable of 24,750 MCFD, a gas allowable credit of 275 SCF/BW removed from the reservoir and a maximum field water production eligible for gas credit of 90,000 BWPD.
4. Very small changes in water and gas production from the field significantly effect the movement of the gas-liquid contact.
  - a. When the gas allowable credit was 300 SCF/BW for several years, the contact moved slowly upward.
  - b. When the credit was reduced to 275 SCF/BW in 2003, the gas-liquid contact moved back down.
5. Since the last field rules change, the gas-liquid has dropped from -6,280 feet to -6,425 feet.
6. There are a total of 61 wells producing from the Keystone (Ellenburger) Field, including 25 wells on submersible pumps which move large volumes of fluid. Daily production from the field is a total 200-300 BOPD, 20 MMCFD and 80,000 BWPD.
7. Cumulative production from the field is 148.9 million BO and 643.6 BCF of gas. Total gas injected is 205 BCF. Approximately 3.7 million BO has been recovered as a result of the reservoir management plan.
8. The 90,000 BW per month maximum water withdrawal eligible for gas allowable credit is difficult to meet due to operational and wellbore issues. Reducing the maximum to 76,500 is more aligned with actual ability to produce water from the field.
9. Continuation of the field rules for an additional three years will allow operators to accumulate additional data necessary to evaluate the operating rules for the field.

**CONCLUSIONS OF LAW**

1. Proper notice was issued as required by all applicable statutes and regulatory codes.
2. All things have occurred and been accomplished to give the Commission jurisdiction in this matter.
3. Amending the field rules for the Keystone (Ellenburger) Field is necessary to prevent waste and protect correlative rights.

**EXAMINER'S RECOMMENDATION**

Based on the above findings and conclusions, the examiners recommend that field rules in effect for the Keystone (Ellenburger) Field be amended to provide for a maximum water withdrawal rate eligible for gas allowable of 76,500 BWPd. It is also recommend that a review hearing be held in 3 years to further evaluate the rules.

Respectfully submitted,

Donna K. Chandler  
Technical Examiner