

October 8, 1999

OIL AND GAS DOCKET NO. 03-0222511

THE APPLICATION OF EOG RESOURCES, INC. (FORMERLY ENRON OIL & GAS COMPANY) FOR NET GAS/OIL RATIO AUTHORITY FOR ITS BUNK WELL NO. 1 AND FIELD RULES IN THE WADSWORTH (11,100-OIL) FIELD, MATAGORDA COUNTY, TEXAS

Heard by: Margaret Allen, Technical Hearings Examiner

Procedural history

Application received: August 27, 1999

Hearing held: October 8, 1999

Appearances

	Representing
Doug Dashiell	EOG Resources Inc.
Kenneth D. Marbach	

EXAMINER'S REPORT AND RECOMMENDATION

STATEMENT OF THE CASE

EOG is seeking the following field rules:

1. Designated interval between 10,903 to 11,034 feet as shown on the log of the EOG Bunk Well No. 1;
2. 933-1867 foot well spacing;
3. 200 acre oil proration units;
4. allocation based on acreage and the 1965 yardstick which assigns 703 BOPD for a well on 200 acres at this depth; and
5. a gas limit of 4,000,000 cubic feet per day as long as the Bunk No. 1 remains classified as an oil well.

DISCUSSION OF THE EVIDENCE

The Wadsworth (11,100-Oil) Field discovered in May of 1998, with the completion of Enron's Bunk Well No. 1. The well is perforated from 10,972 to 10,980 feet within a productive interval that extends from 10,903 feet to 11,034 feet. The reservoir contains volatile oil at an initial

bottom-hole pressure of 8155 psi. The bubble-point pressure is 7238 psi, and the operator thought that unitization and pressure-maintenance through a downdip injection well would provide the maximum oil recovery. The unit was approved by the Railroad Commission in February of 1999, however, when the injection well was drilled on the northeastern edge of the field, only an unusable remnant of the reservoir sand was present. The operator will convert its secondary recovery unit into a pooled unit and produce the recoverable oil by the reservoir's existing solution gas drive.

The reservoir is located on the western side of two large faults, one to the northeast and one to the southeast and contains 184 acres. The oil/water contact is at -10,975 feet, but there is no apparent water influx. The Bunk No. 1 is the only well necessary to deplete the reservoir. Porosity is 25%, the water saturation is 30% and the permeability is 570 md. Volumetric calculations indicate that there were 1,600,000 barrels of oil originally in place, but only 15.4% can be recovered under solution gas drive. The discovery well has already produced 67,000 barrels of the estimated 259,000 barrels of recoverable oil from this reservoir.

The applicant expects the gas/oil ratio to increase quickly as the reservoir pressure decreases. The well will be reclassified to gas fairly quickly, without pressure support that would have been provided by an injection well, and the applicant estimates that there are 5.1 BCF of recoverable gas in this reservoir. The field currently has a discovery allowable of 670 BOPD but the Bunk No. 1 is penalized to 344 barrels per day due to high gas/oil ratio. The 1965 yardstick allowable for wells on 160 acre units at this depth, provides 3.5 barrels of oil per assigned acre. The applicant is requesting 200 acre proration units which yields an allowable of 703 barrels per day. The applicant originally requested an MER allowable for this field, but the well can produce within this oil allowable.

Between August 20 and September 20, 1999, the applicant tested the Bunk No. 1 to determine if an increased gas limit would waste reservoir energy. As the choke size was increased from 12/64th inches to 16/64th inches, the oil and gas rates increased such that the gas/oil ratio remained about 5500 cubic feet per barrel. On an 18/64th inch choke, the oil rate increased to 656 barrels per day but the gas rate did not increase proportionately. The gas rate was 2500 MCF per day for a gas/oil ratio of 3920 cubic feet per barrel. Because the well's gas production is expected to rise quickly, the applicant is requesting a daily gas limit of 4,000,000 cubic feet per day until the well will be reclassified as a gas well.

FINDINGS OF FACT

1. Notice of this hearing was given to all operators in the Wadsworth (11,100-Oil) Field and to all offset operators to the discovery tract on September 17, 1999.
2. The Wadsworth (11,100-Oil) Field was discovered in May of 1998, by the completion of the Bunk No. 1 and this is the only well necessary to drain the entire reservoir.
3. The reservoir covers 184 acres as the downdip reservoir limit was established by a dry hole drilled on the northwest edge of the field.

4. The discovery well has already produced 67,000 barrels of oil and a volumetric estimate indicates that the remaining recoverable reserves under 184 acres are 192,000 barrels of oil and 5 BCF of gas.
5. The interval between 10,903 and 11,034 feet in the discovery well covers the entire productive sand in this reservoir.
6. Well spacing of 933-1867' is standard for 160 acre proration units, though there are no plans to drill a second well in this field.
7. The discovery allowable for the Bunk No. 1 is 670 barrels per day but the well is being penalized to 344 BOPD due to the high gas/oil ratio.
8. The yardstick allowable for wells at this depth on 160 acre density provides for 3.5 barrels per acre and the assigned allowable for a well on 200 acre density would be 703 barrels per day.
9. A step-rate test was performed on this well between August 20 and September 20, 1999, and showed that the most efficient rate of production occurs at rates of 660 BOPD and 2500 MCF/D.
 - a. On a 12/64th inch choke, the oil rate averaged 308 barrels per day with a gas/oil ratio of 5538 cubic feet per barrel.
 - b. On a 14/64th inch choke, the oil rate averaged 291 barrels per day with a gas/oil ratio of 5610 cubic feet per barrel.
 - c. On a 16/64th inch choke, the oil rate averaged 413 barrels per day with a gas/oil ratio of 5518 cubic feet per barrel.
 - d. On an 18/64th inch choke, the oil rate averaged 656 barrels per day with a gas/oil ratio of 3920 cubic feet per barrel.

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 requested field rules, including the increased gas limit, will prevent waste, protect correlative rights within the field, and promote orderly development of the reservoir.

EXAMINER'S RECOMMENDATION

Based on the above findings and conclusions, the examiner recommends that the requested field rules for the Wadsworth (11,100-Oil) Field be approved, as per the attached order.

Respectfully submitted,

Margaret Allen
Technical Hearings Examiner

Date of Commission Action: October 19, 1999

Exhibits

1. Proration schedule
2. New field discovery
3. Map
4. Cross section
5. Wellbore schematic for Well No. 6
6. Wellbore schematic for Well No. 9
7. Forms G-1 for both wells
8. Combined rate vs time graph
9. Separate rate/time graphs for each well