STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION COMMISSION

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 10226 DE NOVO
Order No. R-9501-A

APPLICATION OF BIRD CREEK RESOURCES FOR
SPECIAL POOL RULES, EDDY COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9:00 A.M. on August 29, 1991, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 30th day of October, 1991, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS THAT:

(1) Due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) The applicant, Bird Creek Resources, seeks an order promulgating temporary special rules and regulations, to be in effect for a period of one year, for the East Loving-Delaware Pool, Eddy County, New Mexico, including a provision for a limiting gas-oil ratio of 5000 cubic feet of gas per barrel of oil.

(3) The East Loving-Delaware Pool was created and defined by Division Order No. R-8562 dated December 4, 1987, and currently comprises all or portions of Sections 10, 11, 14, 15, 22, 23, 24, 26, 27 and 34, Township 23 South, Range 28 East, NMPM, Eddy County, New Mexico. The subject pool is currently governed by General Statewide Rules and Regulations including a top unit allowable of 142 barrels of oil and 284 MCF casinghead gas per day at a gas-oil ratio of 2000 cubic feet of gas per barrel of oil.

(4) This matter came on for hearing on February 21, 1991, at Santa Fe, New Mexico, before Examiner David R. Catanach and, pursuant to this hearing, Order No. R-9501 was issued on May 10, 1991, which denied the application of Bird Creek Resources.

(5) On May 16, 1991, application for Hearing De Novo was made by Bird Creek Resources and the matter was therefore set for hearing before the Commission.

(6) This matter came on for hearing De Novo on August 29, 1991.

(7) Oryx Energy Company, (Oryx), an operator in the East Loving-Delaware Pool, appeared at the Commission hearing and presented testimony in opposition to the subject application.

(8) Both the applicant and Oryx presented engineering and geologic evidence and testimony in this case, and, based upon such evidence and testimony, the following conclusions concerning the East Loving-Delaware Pool can be ascertained:

(a) the drive mechanism within the subject reservoir is solution gas with no indication of an extensive gas cap, water influx, formation compaction, or connate water expansion, and,

(b) the Delaware sands within the pool are continuous and appear to be correlatable across the field.

(9) Both Oryx and Bird Creek incorporated finite difference, computer model forecasts to explain their position. Oryx supported their model work with data, consisting of laboratory derived gas-oil and water-oil relative permeability test results along with two complete reservoir fluid studies:

(a) Both agreed to a formation volume factor of 1.5, which insures the presence of a free gas saturation as pressure is depleted.

(b) Bird Creek used a single well model to demonstrate that ultimate oil recovery was essentially independent of the producing GOR.

(c) Oryx used a multiple well model to demonstrate that ultimate oil recovery was dependent on the producing GOR.

(10) Bird Creek's one well model contained all free gas within the 40-acre model area, hence reservoir energy in the form of gas expansion was specific to the single producing well. The model was constructed so that the presence of a highly mobile, free gas would not hinder the flow of oil near the wellbore. The model may be appropriate for a single well field, but it would suffer from the problem of non-uniqueness.

(11) Oryx's multiple well model allowed the production of highly mobile, free gas at other wells. Multiple well simulation permits the modeling of inefficient use of reservoir energy and better simulates field conditions. Oryx, using a four well model, reasonably matched the producing trends observed in two areas of the field. The model was then used to forecast the recovery of an additional 763,000 bbl of oil if the field is produced according to General Statewide Rules and Regulations.

(12) Oryx presented an analytical expression (material balance equation)

demonstrating that ultimate recovery is a function of the cumulative GOR. The material balance equation establishes that the lower the cumulative GOR, the greater the ultimate oil recovery.

(13) Production history presented by Oryx demonstrates that waste of reservoir energy is related to the oil producing rate. The evidence establishes that high oil rates accompanied by high GORs waste reservoir energy and low GORs associated with low oil rates conserve reservoir energy.

(14) The testimony indicates that the East Loving-Delaware Pool is not a series of one well fields. The evidence presented by Oryx demonstrates that producing oil in accordance with the General Statewide Rules and Regulations maximizes ultimate oil recovery, thereby preventing the waste of reservoir energy. Bird Creek failed to prove a need for special rules and their application should be denied.

IT IS THEREFORE ORDERED THAT:

(1) The provision of Division Order No. R-9501, issued in Case 10226, is hereby affirmed and adopted as the order of the Commission.

(2) Jurisdiction is hereby retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

GARY CARLSON, Member

WILLIAM W. WEISS, Member

WILLIAM J. LEMAY, Chairman

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