

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

**IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
DIVISION FOR THE PURPOSE OF
CONSIDERING:**

**CASE NO. 10704
Order No. R-9503-B**

**APPLICATION OF MARATHON OIL COMPANY
TO AMEND DIVISION ORDER NO. R-9503
TO INCREASE THE VERTICAL LIMITS
AUTHORIZED FOR INJECTION IN CERTAIN
INJECTION WELLS IN A WATERFLOOD
PROJECT, LEA COUNTY, NEW MEXICO.**

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on April 8, 1993, at Santa Fe, New Mexico, before Examiner David R. Catanach.

NOW, on this 15th day of June, 1993, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS THAT:

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

(2) By Order No. R-9503 dated May 10, 1991, the Division authorized Marathon Oil Company (Marathon) to institute a waterflood project on its McDonald State A/C-1 Lease comprising the W/2 of Section 15 and the E/2, SE/4 NW/4 and SW/4 of Section 16, both in Township 22 South, Range 36 East, NMPM, Lea County, New Mexico, by the injection of water into the South Eunice Seven Rivers-Queen Pool through twelve injection wells located in Section 16.

(3) Due to the close vertical proximity of the South Eunice Seven Rivers-Queen Pool to the Jalmat Gas Pool, and due to the presence of the ARCO Oil and Gas Company McDonald State "WN" Well Nos. 15 and 23, located in Units L and C, respectively, of Section 15, and the Doyle Hartman Boren-Greer Gas Com Well Nos. 1, 2 and 3 located in Units D and C of Section 21, and Unit A of Section 20, all in Township 22 South, Range 36 East, NMPM, which are all currently completed in the Jalmat Gas Pool, Marathon voluntarily requested that injection into its McDonald State A/C-1 Well Nos. 30, 31, 33, 34 and 40 be confined to the Queen formation.

(4) Such action, being part of an agreement between the applicant and ARCO Oil and Gas Company, was requested by Marathon in order to assure that offset Jalmat Gas Pool producing wells would not be adversely affected by water injection into the Seven Rivers formation inasmuch as the base of the Jalmat Gas Pool in this area corresponds to the top of the South Eunice Seven Rivers-Queen Pool.

(5) By Order No. R-9503-A dated April 7, 1992, the Division authorized Marathon to extend the injection interval in its McDonald State A/C-1 Well No. 30 to include a portion of the Seven Rivers formation.

(6) The applicant, Marathon Oil Company, seeks to amend Division Order No. R-9503 to authorize an increase in the upper limit of the injection interval to correspond to the entire vertical limits of the South Eunice Seven Rivers-Queen Pool in its McDonald State A/C-1 Well Nos. 33, 34 and 40 located, respectively, in Units H, H and I of Section 16.

(7) Evidence and testimony indicate that Marathon has acquired the Jalmat Gas Pool operating rights from ARCO within the W/2 of Section 15 and now currently operates the McDonald "WN" State Well Nos. 15 and 23.

(8) Within the subject area, the applicant has identified an oil bearing sand member within the Seven Rivers formation that it proposes to flood. This sand member, referred to as the Lower Seven Rivers "A" zone, occurs at a depth of approximately 3,758 feet to 3,766 feet in its McDonald State A/C-1 Well No. 40.

(9) The geologic evidence presented by the applicant indicates that the McDonald State "WN" Well No. 23, being the Jalmat producing well most likely to be affected by injection into the McDonald State A/C-1 Well No. 40, does not penetrate the Lower Seven Rivers "A" zone.

(10) In addition, located between the McDonald State "WN" Well No. 23 and the McDonald State A/C-1 Well No. 40, the applicant currently operates the McDonald State A/C-1-A Well No. 4 which is a producing well in the South Eunice-Seven Rivers Queen Pool and which is currently perforated in the Queen and Lower Seven Rivers "A" zone. This wellbore should serve to further protect the McDonald State "WN" Well No. 23 from the possible harmful effect of injection into the McDonald State A/C-1 Well No. 40.

(11) Further evidence presented indicates that the 6 5/8-inch production casing within the McDonald State "WN" Well No. 15 may not be cemented in a manner which will confine the injected fluid to the injection formation.

(12) The McDonald State "WN" Well No. 15 is located approximately 460 feet from the McDonald State A/C-1 Well No. 33.

(13) The evidence indicates that the McDonald State "WN" Well No. 15 is likely to be adversely affected from injection into the Seven Rivers formation through the McDonald State A/C-1 Well No. 34 and especially Well No. 33 at some point in time.

(14) The applicant contends that a requirement to perform remedial cement operations on the McDonald State "WN" Well No. 15 prior to commencing injection operations will likely result, to some extent, in a loss of production thereby decreasing the amount of gas ultimately recovered from the subject well.

(15) The applicant proposed that it be allowed to inject into the Seven Rivers formation as proposed and that it be required to perform remedial cement operations on the McDonald State "WN" Well No. 15 if and when water breaks into said wellbore.

(16) In the event of water breakthrough into the McDonald State "WN" Well No. 15 at some future point in time, it is possible that the loss of gas reserves may be considerably greater than if remedial cement operations are conducted prior to injection.

(17) The chances of conducting successful remedial cement operations on the McDonald State "WN" Well No. 15 would appear to be greater prior to water breakthrough.

(18) The Division would normally permanently shut down injection operations within one half mile of the McDonald State "WN" Well No. 15 if, for some reason, the wellbore is lost or remedial cement operations cannot be successfully performed at such time as water breakthrough occurs in the subject well.

(19) The risk of losing oil reserves from waterflood operations and gas reserves from the McDonald State "WN" Well No. 15 appears to be considerably greater if remedial cement operations are not required prior to commencing injection.

(20) The applicant should be required to perform remedial cement operations on the McDonald State "WN" Well No. 15 prior to commencing injection operations into the Seven Rivers and Queen formations in the McDonald State A/C-1 Well Nos. 33 and 34.

(21) In conformance with the provisions of Division Order No. R-9503, the applicant has acquired cement bond logs on the McDonald State A/C-1 Well Nos. 33, 34 and 40. The results of the cement bond logs indicate fair to good cement bonding across the Seven Rivers and Queen formations.

(22) Also in conformance with the provisions of Division Order No. R-9503, the applicant has acquired profile logs on the McDonald State A/C-1 Well Nos. 33, 34 and 40. The results of the profile log on the McDonald State A/C-1 Well No. 33 indicates the presence of a channel extending upward into the Seven Rivers formation to a depth of approximately 3655 feet. The results of the profile logs on Well Nos. 34 and 40 are inconclusive as to whether or not channeling is occurring into the Jalmat Gas Pool.

(23) Prior to commencing injection operations into Well Nos. 33, 34 and 40, and subsequent to perforating the Seven Rivers "A" interval, the applicant should be required to re-conduct profile logs on the subject wells in order to conclusively demonstrate that channeling is not occurring into the Jalmat Gas Pool.

(24) No offset operator and/or interest owner appeared at the hearing in opposition to the application.

(25) Approval of the subject application subject to the provisions contained within Finding Paragraph Nos. (20) and (23) will allow the applicant the opportunity to recover remaining secondary reserves within the South Eunice Seven Rivers-Queen Pool, thereby preventing waste, will protect remaining gas reserves in the Jalmat Gas Pool, and will not violate correlative rights.

(26) The applicant should consult with the supervisor of the Hobbs District Office of the Division prior to commencing remedial cement operations on the McDonald State "WN" Well No. 15, and should consult with both the Santa Fe and Hobbs offices of the Division prior to conducting profile logs on the subject wells.

IT IS THEREFORE ORDERED THAT:

(1) Division Order No. R-9503, which order authorized Marathon Oil Company to inject water into the Queen formation for secondary recovery purposes in its McDonald State A/C-1 Well Nos. 33, 34 and 40 located, respectively, in Units H, H and I of Section 16, Township 22 South, Range 36 East, NMPM, Lea County, New Mexico, is hereby amended to authorize injection into said wellbores throughout the entire vertical interval encompassing the South Eunice Seven Rivers-Queen Pool.

PROVIDED HOWEVER THAT, prior to commencing injection operations into the Seven Rivers and Queen formations in the McDonald State A/C-1 Well Nos. 33 and 34, the applicant shall perform remedial cement operations on the McDonald State "WN" Well No. 15 in accordance with a procedure approved by the supervisor of the Hobbs District Office of the Division.

PROVIDED FURTHER THAT, prior to commencing injection operations into the McDonald State A/C-1 Well Nos. 33, 34 and 40, and subsequent to perforating the Seven Rivers formation, the applicant shall re-conduct profile logs on the subject wells in order to conclusively demonstrate that channeling is not occurring into the Jalmat Gas Pool.

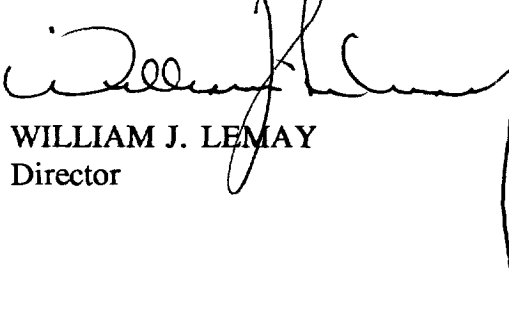
(2) Injection into the subject well(s) shall not be allowed if it is determined that channeling into the Jalmat Gas Pool is occurring, unless the operator takes such action as may be necessary to prevent such migration.

(3) All other provisions contained within Division Order No. R-9503 not inconsistent with the provisions set forth above shall remain in full force and effect.

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

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

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION


WILLIAM J. LEMAY
Director

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