

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. 10762
Order No. R-9737-A*

**APPLICATION OF MEWBOURNE OIL COMPANY FOR A WATERFLOOD PROJECT
AND QUALIFICATION FOR THE RECOVERED OIL TAX RATE, LEA COUNTY,
NEW MEXICO.**

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on July 1, 1993, at Santa Fe, New Mexico, before Examiner Michael E. Stogner.

NOW, on this 13th day of October, 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) At the time of the hearing this case was consolidated with Division Case No. 10761 for the purpose of testimony.
- (3) By Division Order No. R-9737, issued in Case No. 10497 and dated October 1, 1992, Mewbourne Oil Company was authorized to convert its Government "K" Well No. 2, located 1950 feet from the South line and 1980 feet from the West line (Unit K) of Section 23, and its Federal "E" Well No. 11, located 660 feet from the North line and 530 feet from the East line (Unit A) of Section 27, both in Township 18 South,

Range 32 East, NMPM, Lea County, New Mexico, into water injection wells for the purpose of testing the "injectivity" of the Querecho Plains-Upper Bone Spring Pool for a sufficient period of time to establish stabilized injection rates in order to determine the feasibility of commencing a waterflood project in this general area to be unitized at a later date.

(4) The applicant, Mewbourne Oil Company, at this time seeks authority to institute a waterflood project in its proposed Querecho Plains Bone Spring Sand Unit Area (Division Case No. 10761), Lea County, New Mexico, by the injection of water into the designated and Undesignated Querecho Plains-Upper Bone Spring Pool, as found in that stratigraphic interval between 8,328 feet to 8,620 feet as measured on the *Welex - Spectral Density Dual Spaced Neutron Log* ran on November 28, 1987 in the applicant's Federal Well No. 4 located 660 feet from the North line and 1650 feet from the East line (Unit B) of Section 23, Township 18 South, Range 32 East, NMPM, Lea County, New Mexico, through fifteen certain wells to be converted from producing wells to injectors, as further described in Exhibit "A" attached hereto and made a part hereof.

(5) It is proposed that the waterflood project area coincide with the boundary of the Querecho Plains Bone Spring Sand Unit Area in Lea County, New Mexico, as further described below, which was the subject of Division Case No. 10761 and was heard in combination with this case:

TOWNSHIP 18 SOUTH, RANGE 32 EAST, NMPM

Section 13: S/2 SW/4
Section 14: SE/4
Section 22: NE/4 SE/4 and S/2 SE/4
Section 23: All
Section 24: W/2 NW/4 and SW/4 SW/4
Section 26: N/2
Section 27: All
Section 28: E/2

(6) The above-described area contains several tracts of undeveloped acreage; therefore, in compliance with Division General Rule 701.G(1) the project area as requested should be reduced to include only those oil spacing and proration units within the proposed area that have experienced production from the Querecho Plains-Upper Bone Spring Pool, being the following described 2,040 acres in Lea County, New Mexico:

TOWNSHIP 18 SOUTH, RANGE 32 EAST, NMPM

Section 13: SW/4 SW/4
Section 14: SE/4
Section 22: SE/4 SE/4
Section 23: NE/4, S/2 NW/4 and S/2
Section 24: W/2 NW/4 and SW/4 SW/4
Section 26: N/2 NE/4, SW/4 NE/4 and NW/4
Section 27: E/2 NE/4, SW/4 NE/4, SE/4 NW/4 and E/2 SW/4

(7) The present Upper Bone Spring oil producing wells within the subject project area are in an advanced state of depletion and should therefore be properly classified as "stripper wells".

(8) The results of the injectivity test approved by said Order No. R-9737 indicates that both of the test wells are capable of injection rates of 700 to 800 barrels of water per day at the maximum injection pressure of 1650 psi permitted by said Order No. R-9737. Further, injection surveys from both wells indicated that the injected waters remained confined to the Upper Bone Spring interval.

(9) The applicant further requests a surface limitation pressure in excess of the Division's guidelines of 0.2 psi per foot of depth, but not in excess of 2,000 psi surface pressure.

(10) In support of this request the applicant presented additional results from its injectivity tests, showing that the Delaware produced water utilized for injection had a gradient hydrostatic head of 0.51 psi per foot. While injecting this "heavy water" at the maximum 1650 psi (as permitted by Order R-9737) the total gradient hydrostatic head generated at depth was equal to 0.70 psi per foot. The applicant testified that the average formation fracture gradient for the Querecho Plains-Upper Bone Spring Pool is equal to 0.74 psi per foot as determined by the initial shut-in pressures from fracture stimulations which were performed on several wells in the general area. Injected waters to be utilized in this project initially will consist of fresh water to be purchased from the City of Carlsbad, New Mexico (approximately 90 percent of volume) with the remaining volume to be produced salt water from surrounding operators. The fluid gradient for this "less heavy" water is expected to be approximately 0.45 psi per foot. With a 2,000 psi pressure limit at the surface the total gradient hydrostatic head generated at depth calculates out at 0.69 psi per foot, which is below the fracture gradient for the pool.

(11) The increase in surface injection pressure as requested by the applicant is not expected to have an adverse effect on the unitized interval, further the proposed waterflood project should result in the recovery of otherwise unrecoverable oil, thereby preventing waste.

(12) The operator of the proposed Querecho Plains Bone Spring Sand Unit Waterflood Project should take all steps necessary to ensure that the injected water enters and remains confined to only the proposed injection interval (Upper Bone Spring zone) and is not permitted to escape from that interval and migrate into other formations, producing intervals, pools or onto the surface from injection, production, or plugged and abandoned wells.

(13) The previously plugged and abandoned BTA Oil Producers Cinco de Mayo Federal Well No. 1, the former Ralph Lowe Yates-Federal Well No. 1, located 660 feet from the North line and 1980 feet from the West line (Unit C) of Section 24, Township 18 South, Range 32 East, NMPM, Lea County, New Mexico, is located within the one-half mile "area of review" of the proposed Federal "P" (water inject) Well No. 1, located 660 feet from the North and West lines (Unit D) of said Section 24.

Prior to commencement of injection into said Federal "P" Well No. 1, the operator should demonstrate to the satisfaction of the supervisor of the Division's District Office in Hobbs that the BTA Oil Producers Cinco de Mayo Federal Well No. 1, the former Ralph Lowe Yates-Federal Well No. 1, as described above, has been re-entered and replugged in such a manner as to ensure that it does not provide an avenue of escape for waters from the proposed injection interval.

(14) Likewise, the previously plugged and abandoned Lewis B. Burleson, Inc. Anadarko Federal Well No. 1, located 660 feet from the South line and 1980 feet from the West line (Unit N) of Section 27, Township 18 South, Range 32 East, NMPM, Lea County, New Mexico, is located within the one-half mile "area of review" of the proposed Federal "E" (water inject) Well No. 10, located 2310 feet from the North and East lines (Unit G) of said Section 27.

Prior to commencement of injection into said Federal "E" Well No. 10, the operator should demonstrate to the satisfaction of the supervisor of the Division's District Office in Hobbs that the Lewis B. Burleson, Inc. Anadarko Federal Well No. 1, as described above, has either been re-entered and replugged or has previously been plugged and abandoned in such a manner as to ensure that it does not provide an avenue of escape for waters from the proposed injection interval of the Mewbourne well or that said wellbore will not otherwise serve for such escape.

(15) From the evidence presented at the hearing it appears the applicant's existing Federal "E" Well No. 1, located 660 feet from the North line and 1980 feet from the East line (Unit B) of Section 27, Township 18 South, Range 32 East, NMPM, Lea County, New Mexico, which is also within this "area of review" and currently completed in and producing from the North Lusk-Morrow Gas Pool, is not cemented or completed in such a manner which will prevent the migration of fluid from the proposed injection zone.

Therefore, prior to commencing injection operations into the Federal "E" Well Nos. 10 and 11 located in Units "G" and "A", respectively, of said Section 27 the operator should demonstrate to the satisfaction of the supervisor of the Division's District Office in Hobbs that the Federal "E" Well No. 1, as described above, has either been recompleted or is shown to have been previously completed in such a manner as to ensure that they do not provide an avenue of escape for waters from the proposed injection interval of the Mewbourne Morrow gas well or that said wellbore will not otherwise serve for such escape.

(16) Sufficient evidence on the corrosive nature of the proposed injection fluid was submitted by the applicant to support its request to utilize "bare steel" tubing instead of internally plastic-coated tubing at this time.

(17) The injection of water into the proposed injection wells should be accomplished either through 2 3/8-inch or 2 7/8-inch steel tubing installed in a packer set within 100 feet of the uppermost injection perforation; the casing-tubing annulus should be filled with an inert fluid and a gauge or approved leak-detection device should be attached to the annulus in order to determine leakage in the casing, tubing or packer.

(18) Prior to commencing injection operations into the proposed injection wells, the casing in each well should be pressure tested throughout the interval from the surface down to the proposed packer setting depth, to assure the integrity of such casing.

(19) The injection wells or pressurization system for each well should be so equipped as to limit injection pressure at the wellhead to no more than 2,000 psi.

(20) Any further increase in the injection pressure limitation placed upon any well in the project area should only be approved after proper notice and hearing.

(21) The operator should give advance notification to the supervisor of the Hobbs District Office of the Division of the date and time of the installation of injection equipment and of the mechanical integrity pressure-tests in order that the same may be witnessed.

(22) The proposed waterflood project should be approved and the project should be governed by the provisions of Rule Nos. 701 through 708 of the Oil Conservation Division Rules and Regulations.

(23) The applicant further requests that the subject waterflood project be approved by the Division as a qualified "Enhanced Oil Recovery Project" pursuant to the "Enhanced Oil Recovery Act" (Laws 1992, Chapter 38, Sections 1 through 5).

(24) The evidence presented indicates that the subject waterflood project meets all the criteria for approval.

(25) The approved "project area" should initially comprise that area described in Finding Paragraph No. (6) above.

(26) To be eligible for the EOR credit, prior to commencing injection operations, the operator must request from the Division a Certificate of Qualification, which certificate will specify the proposed project area as described above.

(27) At such time as a positive production response occurs and within five years from the date of the Certificate of Qualification, the applicant must apply to the Division for certification of positive production response, which application shall identify the area actually benefitting from enhanced recovery operations, and identifying the specific wells which the operator believes are eligible for the credit. The Division may review the application administratively or set it for hearing. Based upon evidence presented, the Division will certify to the Department of Taxation and Revenue those lands and wells which are eligible for the credit.

(28) The injection authority granted herein for the proposed injection wells should terminate one year after the effective date of this order if the operator has not commenced injection operations into the subject wells, provided however, the Division, upon written request by the operator, may grant an extension thereof for good cause shown.

IT IS THEREFORE ORDERED THAT:

(1) The applicant, Mewbourne Oil Company, is hereby authorized to institute a waterflood project in its Querecho Plains Bone Spring Sand Unit Area (Division Case No. 10761), Lea County, New Mexico, by the injection of water into the designated and Undesignated Querecho Plains-Upper Bone Spring Pool (as found in that stratigraphic interval between 8,328 feet to 8,620 feet as measured on the *Welex - Spectral Density Dual Spaced Neutron Log* ran on November 28, 1987 in the applicant's Federal Well

No. 4 located 660 feet from the North line and 1650 feet from the East line (Unit B) of Section 23, Township 18 South, Range 32 East, NMPM, Lea County, New Mexico) through fifteen certain wells to be converted from producing wells to injectors, as further described in Exhibit "A" attached hereto and made a part hereof.

(2) The waterflood project, hereby designated the Querecho Plains Bone Spring Sand Unit Waterflood Project, shall coincide with the boundary of the Querecho Plains Bone Spring Sand Unit Area, as further described below, and was the subject of Division Case No. 10761 which was heard in combination with this case:

**QUERECHO PLAINS BONE SPRING SAND UNIT WATERFLOOD PROJECT
LEA COUNTY, NEW MEXICO**

TOWNSHIP 18 SOUTH, RANGE 32 EAST, NMPM

Section 13: S/2 SW/4
Section 14: SE/4
Section 22: NE/4 SE/4 and S/2 SE/4
Section 23: All
Section 24: W/2 NW/4 and SW/4 SW/4
Section 26: N/2
Section 27: All
Section 28: E/2

(3) However, the initial waterflood project area, for allowable and tax credit purposes shall comprise only the following described 2040 acres in Lea County, New Mexico:

TOWNSHIP 18 SOUTH, RANGE 32 EAST, NMPM

Section 13: SW/4 SW/4
Section 14: SE/4
Section 22: SE/4 SE/4
Section 23: NE/4, S/2 NW/4 and S/2
Section 24: W/2 NW/4 and SW/4 SW/4
Section 26: N/2 NE/4, SW/4 NE/4 and NW/4
Section 27: E/2 NE/4, SW/4 NE/4, SE/4 NW/4 and E/2 SW/4

(4) The applicant must take all steps necessary to ensure that the injected water only enters and remains confined to the proposed injection interval and is not permitted to escape to other formations or onto the surface from injection, production, or plugged and abandoned wells.

PROVIDED HOWEVER THAT:

(5) Injection into the Federal "P" Well No. 1, located 660 feet from the North and West lines (Unit D) of Section 24, Township 18 South, Range 32 East, NMPM, Lea County, New Mexico, shall not commence until the previously plugged and abandoned BTA Oil Producers Cinco de Mayo Federal Well No. 1, the former Ralph Lowe Yates-Federal Well No. 1, located 660 feet from the North line and 1980 feet from the West line (Unit C) of said Section 24, has either been re-entered and replugged or is shown to have been adequately plugged and abandoned in a manner that ensures it does not provide an avenue of escape for waters from the proposed injection interval to the satisfaction of the Supervisor of the Division's District Office in Hobbs.

(6) FURTHER, injection into the Federal "E" Well No. 10, located 2310 feet from the North and East lines (Unit G) of Section 27, Township 18 South, Range 32 East, NMPM, Lea County, New Mexico, shall not commence until the previously plugged and abandoned Lewis B. Burleson, Inc. Anadarko Federal Well No. 1, located 660 feet from the South line and 1980 feet from the West line (Unit N) of said Section 27, has either been re-entered and re-plugged or is shown to have been adequately plugged and abandoned in a manner that ensures it does not provide an avenue of escape for waters from the proposed injection interval to the satisfaction of the Supervisor of the Division's District Office in Hobbs.

(7) ALSO, injection into the Federal "E" Well Nos. 10 and 11 located in Units "G" and "A", respectively, of said Section 27, shall not commence until the applicant's Federal "E" Well No. 1, located 660 feet from the North line and 1980 feet from the East line (Unit B) of said Section 27, has either been recompleted or is shown to have been previously completed in such a manner as to ensure that they do not provide an avenue of escape for waters from the proposed injection interval to the satisfaction of the Supervisor of the Division's District Office in Hobbs.

IT IS FURTHER ORDERED THAT:

(8) Injection shall be accomplished through 2 3/8-inch or 2 7/8-inch bare steel tubing installed in a packer set approximately within 100 feet of the uppermost injection perforation; the casing-tubing annulus in each well shall be filled with an inert fluid and equipped with an approved pressure gauge or attention-attracting leak detection device.

(9) The injection wells or pressurization system for each injection well shall be so equipped as to limit injection pressure at the wellhead to no more than 2,000 psi.

(10) Any additional increase in the injection pressure limitation placed upon any well in the project area shall only be approved after proper notice and hearing.

(11) Prior to commencing injection operations, the casing in each injection well shall be pressure-tested throughout the interval from the surface down to the proposed packer setting depth, to assure the integrity of such casing.

(12) The operator shall give advance notification to the supervisor of the Hobbs District Office of the Division of the date and time of the installation of injection equipment and of the mechanical integrity pressure-test in order that the same may be witnessed.

(13) The applicant shall immediately notify the supervisor of the Hobbs District Office of the Division of the failure of the tubing, casing or packer in any of the injection wells, the leakage of water or oil from or around any producing well, or the leakage of water or oil from any plugged and abandoned well within the project area, and shall take such steps as may be timely and necessary to correct such failure or leakage.

(14) The applicant shall conduct injection operations in accordance with Division Rule Nos. 701 through 708 and shall submit monthly progress reports in accordance with Division Rule Nos. 706 and 1115.

FURTHERMORE:

(15) The subject waterflood project is hereby approved as an "Enhanced Oil Recovery Project" pursuant to the "Enhanced Oil Recovery Act" (Laws 1992, Chapter 38, Sections 1 through 5).

(16) The approved "project area" shall initially comprise that area described in Decretory Paragraph No. (3) above.

(17) To be eligible for the EOR credit, prior to commencing injection operations, the operator must request from the Division a Certificate of Qualification, which certificate will specify the proposed project area as described above.

(18) At such time as a positive production response occurs and within five years from the date of the Certificate of Qualification, the applicant must apply to the Division for certification of positive production response, which application shall identify the area actually benefitting from enhanced recovery operations, and identifying the specific wells

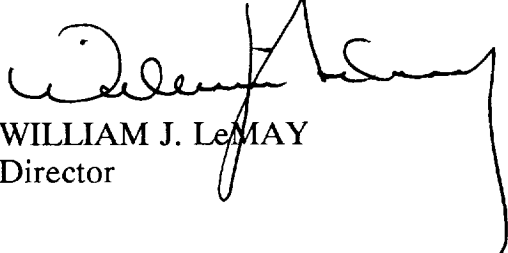
which the operator believes are eligible for the credit. The Division may review the application administratively or set it for hearing. Based upon evidence presented, the Division will certify to the Department of Taxation and Revenue those lands and wells which are eligible for the credit.

(19) The injection authority granted herein for the proposed injection wells shall terminate one year after the effective date of this order if the operator has not commenced injection operations into the subject wells, provided however, the Division, upon written request by the operator, may grant an extension thereof for good cause shown.

(20) Jurisdiction of this cause is 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

S E A L

EXHIBIT "A"

**CASE NO. 10762
ORDER NO. R-9737-A**

Mewbourne Oil Company

**Proposed Injection Well Locations
Querecho Plains Bone Spring Sand Unit Waterflood Project Area
Township 18 South, Range 32 East, NMPM,
Lea County, New Mexico**

Well Name and Number	Footage Location	Sec- tion	Unit	Proposed Injection Interval (Feet)
Santa Fe Energy Operating Partners, L.P. Shinnery "14" Federal Well No. 4	1980'FSL - 660'FEL	14	I	8412 - 8490
Santa Fe Energy Operating Partners, L.P. Shinnery "14" Federal Well No. 3	1980'FS & EL	14	J	8478 - 8504
Federal "L" Well No. 5	660' FN & EL	23	A	8430 - 8574
Federal "L" Well No. 4	660'FNL - 1650'FEL	23	B	8431 - 8506
Federal "L" Well No. 7	2310'FSL - 990'FEL	23	I	8485 - 8552
Federal "L" Well No. 2	2130'FSL - 2030'FEL	23	J	8458 - 8531
Government "K" Well No. 2	1950'FSL - 1980'FWL	23	K	8343 - 8515
Federal "F" Well No. 3	1980'FSL - 990'FWL	23	L	8362 - 8436
Federal "P" Well No. 1	660'FN & WL	24	D	8473 - 8545
Burleson Federal Well No. 2	660'FN & EL	26	A	8515 - 8584
Burleson Federal Well No. 1	660'FNL - 2310'FEL	26	B	8512 - 8572
Sprinkle Federal Well No. 2	660'FNL - 1980'FWL	26	C	8542 - 8574
Sprinkle Federal Well No. 1	660'FN & WL	26	D	8507 - 8532
Federal "E" Well No. 11	660'FNL - 530'FEL	27	A	8360 - 8388
Federal "E" Well No. 10	2310'FN & EL	27	G	8501 - 8530