

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. 10103
Order No. R-9359

APPLICATION OF SAGE ENERGY
COMPANY FOR 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 October 3 and 31, 1990, at Santa Fe, New Mexico, before Examiners Jim Morrow and Michael E. Stogner.

NOW, on this 13th day of November, 1990, 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) Division Cases Nos. 10102 and 10103 were consolidated at the time of the hearing for purpose of testimony.

(3) The applicant, Sage Energy Company, seeks authority to institute a waterflood project in its proposed North Vacuum (Abo) North Unit Area consisting of 1762.79 acres, more or less, located in all or portions of Sections 35 and 36, Township 16 South, Range 34 East, and Sections 1, 2, and 12, Township 17 South, Range 34 East, by the injection of water into the North Vacuum-Abo Pool through 19 wells to be converted as injection wells. In companion case No. 10102 applicant proposed statutory unitization of the North Vacuum (Abo) North Unit.

(4) The proposed initial injection wells are planned conversions of existing producing wells.

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(5) The applicant proposes to utilize an 80-acre five spot injection pattern within the proposed waterflood project which will coincide with Mobil's two floods to the South.

(6) The producing formation in the proposed project area is in an advanced stage of depletion and the area is suitable for waterflooding.

(7) The proposed waterflood project should result in the recovery of approximately two million barrels of otherwise unrecoverable oil, thereby preventing waste, and should otherwise protect correlative rights.

(8) The waterflood would be installed in two phases, eventually utilizing 19 injection wells and 18 producing wells. Water injection within the proposed Unit Area would be into the unitized Abo formation at a depth of approximately 8450 feet.

(9) In reworking the 19 proposed injection wells, applicant plans to pull the current tubing, pressure test it, run it back in the hole on a "Baker" lock-set packer and commence injection. Applicant's witness also testified that the tubing-casing annulus would be filled with packer fluid and that an annual pressure test would be conducted.

(10) Applicant's witness testified that there are four plugged wells in the area that penetrate the North Vacuum-Abo Pool and that all four have been adequately plugged according to Oil Conservation Division requirements.

(11) Applicant plans to inject fresh and produced water at an initial rate of 400 barrels per well per day at an estimated wellhead pressure of 1,000 psi. Eventually a wellhead pressure of 4,500 psi is expected to be required to inject at a rate of 200 barrels of water per day. The injection system would be closed. Analysis of the produced and fresh waters indicates the waters are compatible.

(12) Applicant requested approval to use unlined injection tubing in the nineteen injection wells. This request should be approved for those wells into which fresh water only is injected.

(13) Applicant submitted a tabulation of wells in the waterflood area and testified that each well is adequately cased and cemented to protect fresh water in the area. The tabulation also shows that the Abo injection interval is properly cased and cemented in each well.

(14) Applicant further testified that fresh water in the area is from the Ogallala and that the base of the fresh water is at 200 feet.

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(15) According to applicant's testimony, there are no faults or hydrologic connections between the fresh water sources and the injection formation.

(16) Applicant requested capacity allowable, an administrative procedure for approving unorthodox well locations and an administrative procedure for changing producing wells to injection wells. Since the Oil Conservation Division's statewide rules authorize capacity allowable and the requested procedures (Rules 701 F 3 and 4 and Rule 104 F I), rules covering these procedures are not needed in this order.

(17) The injection wells or injection pressurization system should be so equipped as to limit injection pressure at the wellhead to no more than 0.2 psi per foot of depth from the surface to the top injection perforation in any injection well, but the Division Director should have authority to increase said pressure limitation upon a proper showing that said pressure increase would not result in the fracturing of the injection formation or confining strata.

(18) Prior to initiating injection into any of the injection wells, the applicant should be required to pressure test the casing in each of the proposed injection wells from the surface to the proposed packer-setting depth to assure the integrity of said casing.

(19) 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 test in order that the same may be witnessed.

(20) No interested party appeared and objected to the proposed waterflood project.

(21) The application should be approved and the project should be governed by the provisions of Rules 701 through 708 of the Oil Conservation Division Rules and Regulations.

IT IS THEREFORE ORDERED THAT:

(1) The applicant, Sage Energy Company, is hereby authorized to institute a waterflood project in the North Vacuum (Abo) North Unit Area (described in Ordering Paragraph No. (2) of Division Order No. R-9358), by the injection of water into the unitized interval (described in Ordering Paragraph No. (3) of Division Order No. R-9358) through 19 initial injection wells as shown on Exhibit "A" attached to this order.

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(2) The injection wells herein authorized and/or the injection pressurization system shall be so equipped as to limit injection pressure at the wellhead to no more than 0.2 psi per foot of depth from the surface to the top injection perforation, provided however, the Division Director may authorize a higher surface injection pressure upon satisfactory showing that such higher pressure will not result in fracturing of the injection formation or confining strata.

(3) Except as noted below, injection into each of said wells shall be through plastic or cement-lined tubing set in a packer which shall be located as near as practicable to the uppermost perforations, or, in the case of open hole completions, as near as practicable to the casing-shoe; the casing-tubing annulus shall be loaded with an inert fluid and equipped with an approved pressure gauge or attention-attracting leak-detection device. Plastic or cement-lined tubing shall not be required for wells into which fresh water only is injected.

(4) Prior to initiating injection into any of the injection wells shown on Exhibit "A", the applicant shall pressure-test the casing in each of the proposed injection wells from the surface to the proposed packer setting depth to assure the integrity of said casing.

(5) The applicant shall notify the supervisor of the Hobbs district office of the Division prior to conducting any casing pressure-test on any injection well shown on Exhibit "A".

(6) The applicant shall immediately notify the Supervisor of the Hobbs district office of the Division of the failure of the tubing 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 timely steps as may be necessary or required to correct such failure or leakage.

(7) The authorized subject waterflood is hereby designated the North Vacuum (Abo) North Unit Waterflood Project and shall be governed by the provisions of Rules 701 through 708 of the Division Rules and Regulations.

(8) Monthly progress reports of the waterflood project herein authorized shall be submitted to the Division in accordance with Rules 704 and 1120 of the Division Rules and Regulations.

(9) Jurisdiction of this cause is retained for the entry of such further orders as the Division may deem necessary.

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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

dr/

EXHIBIT "A"
Case No. 10103 - Order No. R-9359
North Vacuum (Abo) North Unit
Unit Injection Wells

WELLLOCATIONSECTION 35, TOWNSHIP 16 SOUTH, RANGE 34 EAST, NMPM

Sage Energy Company Pennzoil 35 State No. 1	460' FSL and 660' FEL, Unit P
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SECTION 36, TOWNSHIP 16 SOUTH, RANGE 34 EAST, NMPM

Sage Energy Company Pennzoil State No. 1	460' FSL and 1980' FWL, Unit N
Exxon A State No. 1	460' FSL and 660' FEL, Unit P

SECTION 1, TOWNSHIP 17 SOUTH, RANGE 34 EAST, NMPM

Sage Energy Company Shell C State No. 1	800' FNL and 2120' FEL, Unit B
Exxon State No. 1	860' FNL and 660' FWL, Unit D
Exxon B State Com No. 1	2180' FNL and 1980' FWL, Unit F
Shell C State No. 2	1980' FNL and 860' FEL, Unit H
Shell State No. 1	1780' FSL and 1980' FEL, Unit J
Shell A State No. 1	1980' FSL and 860' FWL, Unit L
State A No. 1	460' FSL and 1980' FWL, Unit N
Shell B State No. 1	660' FSL and 860' FEL, Unit P

SECTION 2, TOWNSHIP 17 SOUTH, RANGE 34 EAST, NMPM

Sage Energy Company Gallagher State No. 1	660' FNL and 1780' FEL, Unit B
State Com No. 1	1980' FNL and 460' FEL, Unit H
State Com No. 2	1980' FSL and 1980' FEL, Unit J
Cities Service State No. 1	660' FSL and 460' FEL, Unit P
Marathon Oil Company State E-619-A No. 1	1980' FNL and 1980' FWL, Unit F
Wainoco E-619 St. A/C-B No. 1	660' FSL and 1980' FWL, Unit N

SECTION 12, TOWNSHIP 17 SOUTH, RANGE 34 EAST, NMPM

Sage Energy Company Marathon State No. 1	860' FNL and 660' FWL, Unit D
Marathon State No. 2	1980' FNL and 1780' FWL, Unit F