

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. 12399  
ORDER NO. R-11389

**APPLICATION OF EOG RESOURCES, INC. FOR APPROVAL OF A PILOT  
WATERFLOOD PROJECT IN THE RED HILLS NORTH UNIT AREA, LEA  
COUNTY, NEW MEXICO.**

**ORDER OF THE DIVISION**

**BY THE DIVISION:**

These cases came on for hearing at 8:15 a.m. on May 18, 2000, at Santa Fe, New Mexico before Examiner Michael E. Stogner.

NOW, on this 26th day of May, 2000, the Division Director, having considered the testimony, the record and the recommendations of the Examiner,

**FINDS THAT:**

(1) Due public notice has been given and the Division has jurisdiction of these cases and their subject matter.

(2) At the hearing, Division Cases No. 12329 and 12399 were consolidated for the purpose of testimony.

(3) The applicant, EOG Resources, Inc. ("EOG"), seeks authority to institute a one-well pilot secondary recovery project on a portion of its Red Hills North Unit Area (being the subject of Division Order No. R-11388, issued in Case No. 12329 and dated May 25, 2000), by the reinjection of produced water into the Third Bone Spring Sand of the Red Hills-Bone Spring Pool (unitized interval) through the perforated interval from approximately 12,240 feet to 12,264 feet in its Vaca "13" Federal Well No. 2 (API No. 30-025-32182) located 660 feet from the North line and 1980 feet from the East line (Unit B) of Section 13, Township 25 South, Range 33 East, NMPM, Lea County, New Mexico.

(4) Eventually, the proposed secondary recovery project, when fully activated and developed, will coincide with the boundaries of the Red Hills North Unit described as follows:

**LEA COUNTY, NEW MEXICO**  
**TOWNSHIP 25 SOUTH, RANGE 33 EAST, NMPM**

Section 1:	Lots 2 and 3, SW/4 NE/4, SE/4 NW/4, and S/2
Section 12:	All
Section 13:	N/2 and E/2 SE/4

**TOWNSHIP 25 SOUTH, RANGE 34 EAST, NMPM**

Section 6:	Lots 6 and 7, E/2 SW/4, and W/2 SE/4
Section 7:	All
Section 8:	W/2 SW/4
Section 17:	SW/4 NE/4, W/2, and W/2 SE/4
Section 18:	All.

- (5) The applicant presented evidence indicating that:
- (a) there are currently 39 producing oil wells within the unit area;
  - (b) the current average monthly rate of production from the unit area is 1,590 BOPD and 2.7 MMCFPD; this translates to an average daily rate of 41 BOPD per well;
  - (c) cumulative production from this unit area is approximately 5.5 MMBO and 8.0 BCF of gas;
  - (d) total primary recovery from this reservoir with the above-described producing oil wells is estimated at 12.7 MMBO and 36 BCF of gas; and
  - (e) the incremental production from the proposed secondary recovery project is estimated to yield an additional 10.0 MMBO that would not otherwise be recovered.

(6) The current producing rates for the wells within the unit area are "non-marginal" in nature; therefore, pursuant to Division Rule 701.F, the proposed project should be classified as a "pressure maintenance" project and governed accordingly.

(7) For the initial or pilot phase of the proposed pressure maintenance project, the area for purposes of allowable under Division Rule 701 should include the S/2 of Section 12 and the N/2 of Section 13, Township 25 South, Range 33 East, NMPM, Lea County, New Mexico. As additional wells are placed on injection, the project area should automatically expand to include the proration units on which those injection wells are located and all direct and diagonally offsetting proration units within the unit area that have producing wells.

(8) The proposed pressure maintenance project and the unitized management, operation, and further development of the Red Hills North Unit Area, as proposed, is reasonable, serves to effectively increase the ultimate recovery of oil and gas from the unit area, is in the best interest of conservation, exhibits sound engineering practices, prevents waste, and will not impair correlative rights; therefore, the subject application should be approved and the project should be governed by the provisions of Division Rules 701 through 708.

(9) Produced water from the Bone Spring producing wells within the applicant's unit area is to be the initial source of injection water into the proposed project.

(10) The proposed project should be designated the "*Red Hills North Unit Pressure Maintenance Project*."

(11) By Division Order No. R-10109 issued in Case No. 10943 and dated April 26, 1994, as amended by Division Order No. R-10109-A issued in Case No. 11375 and dated October 31, 1995, special pool rules were established for the Red Hills-Bone Spring Pool, including provisions for: (i) 80-acre spacing and proration units (see **RULE 2**); (ii) designated well location requirements where each well completed in said pool is to be no closer than 330 feet to any governmental quarter-quarter section or lot (see **RULE 4**); and (iii) a top depth bracket allowable of 660 barrels of oil per day for a standard 80-acre unit (see **RULE 6**).

(12) The project allowable should be equal to the top unit allowable for the Red Hills-Bone Spring Pool times the number of developed (production or injection) proration units within the project area. Furthermore, the transfer of allowables between wells within the project area should be permitted.

(13) The operator of the Red Hills North Unit Pressure Maintenance project should take all steps necessary to ensure that the injected water enters and remains confined to the proposed injection interval and is not permitted to escape from that interval and migrate into other formations or onto the surface from injection, production, or plugged and abandoned wells.

(14) Injection into the Vaca "13" Federal Well No. 2 should be accomplished through 2-3/8 inch plastic-lined tubing installed in a packer set within 100 feet of the upper-most injection perforations; the casing-tubing annulus should be filled with an inert fluid and equipped with an approved gauge or leak detection device.

(15) Before injection operations begin, the above-described injection well should be pressure tested throughout the interval from the surface down to the proposed upper-most perforation to ensure the mechanical integrity of the well.

(16) At the hearing the applicant requested a maximum surface injection pressure of 3,700 psi to equal the initial reservoir pressure of the Third Bone Spring Sand of 9,500 psi, which is in excess of the state's standard 0.2 pound per foot of depth from the surface to the top-most injection perforation. The applicant did not support this request with adequate technical data; therefore, this request will be decided at a later time when a step-rate test can be performed on the proposed injection well.

(17) The injection wells or pressurization system should be so equipped as to limit injection pressure at the wellhead to no more than 2,450 psi; however, the Division Director should have the authority to administratively authorize a pressure limitation in excess of the pressure limitation described above upon a showing by the operator that such higher pressure will not result in the fracturing of the injection formation or confining strata.

(18) The operator should give advanced notification to the supervisor of the Division's Hobbs District Office 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.

(19) The proposed pressure maintenance project should be approved and the provisions of Division Rules No. 701 through 708 should govern the project.

(20) The injection authority granted herein for any proposed injection well should terminate one year after the effective date of this order if the operator has not commenced injection operations into the well, 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, EOG Resources, Inc. ("EOG"), is hereby authorized to institute a one well pilot pressure maintenance project on a portion of its Red Hills North Unit Area (Division Order No. R-11388) by the reinjection of produced water into the Third Bone Spring Sand of the Red Hills-Bone Spring Pool (unitized interval) in its Vaca "13" Federal Well No. 2 (**API No. 30-025-32182**) located 660 feet from the North line and 1980 feet from the East line (Unit B) of Section 13, Township 25 South, Range 33 East, NMPM, Lea County, New Mexico.

(2) Once fully established the proposed pressure maintenance project, hereby designated the ***Red Hills North Unit Pressure Maintenance Project***, shall comprise the following described lands in Lea County, New Mexico:

**TOWNSHIP 25 SOUTH, RANGE 33 EAST, NMPM**

Section 1:	Lots 2 and 3, SW/4 NE/4, SE/4 NW/4, and S/2
Section 12:	All
Section 13:	N/2 and E/2 SE/4

**TOWNSHIP 25 SOUTH, RANGE 34 EAST, NMPM**

Section 6:	Lots 6 and 7, E/2 SW/4, and W/2 SE/4
Section 7:	All
Section 8:	W/2 SW/4
Section 17:	SW/4 NE/4, W/2, and W/2 SE/4
Section 18:	All.

(3) However, for the initial or pilot phase of this project, the area for purposes of allowable under Division Rule 701 and **Rule 6** of the "*Special Rules and Regulations for the Red Hills-Bone Spring Pool*," as promulgated by Division Orders No. R-10109 and R-10109-A, shall be confined to the S/2 of Section 12 and the N/2 of Section 13, Township 25 South, Range 33 East, NMPM, Lea County, New Mexico. As additional wells are placed on injection, the project area shall automatically expand to include the proration units on which those injection wells are located and all direct and diagonally offsetting proration units within the unit area that have producing wells thereon.

(4) The applicant shall take all steps necessary to ensure that the injected water 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.

(5) Injection into the above-described Vaca "13" Federal Well No. 2 shall be accomplished through 2-3/8 inch plastic-lined tubing installed in a packer set within 100 feet of the upper-most injection perforations, with injection into the perforated interval from approximately 12,240 feet to 12,264 feet.

(6) The casing-tubing annulus shall be filled with an inert fluid and equipped with an approved gauge or leak detection device.

(7) Before injection operations begin, the Vaca "13" Federal Well No. 2 shall be pressure tested throughout the interval from the surface down to the proposed upper-most perforation to ensure its mechanical integrity.

(8) The injection well or its pressurization system shall be so equipped as to limit injection pressure at the wellhead to no more than 2,450 psi.

(9) The Division Director has the authority to administratively authorize a pressure limitation in excess of the pressure limitation described above upon showing by the operator that such higher pressure will not result in the fracturing of the injection formation or confining strata.

(10) The operator shall give advanced notification to the supervisor of the Division's Hobbs District Office 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.

(11) The operator shall immediately notify the supervisor of the Division's Hobbs District Office of the failure of the tubing, casing, or packer assembly in any of the injection wells, or the leakage of water or oil from any producing well or 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.

(12) The project allowable shall be equal to the top depth bracket allowable for the Red Hills-Bone Spring Pool, which is 660 barrels of oil per day, times the number of developed (producing or injecting) perforation units within the pressure maintenance project area. Further, the transfer of allowables between wells within the project area shall be permitted.

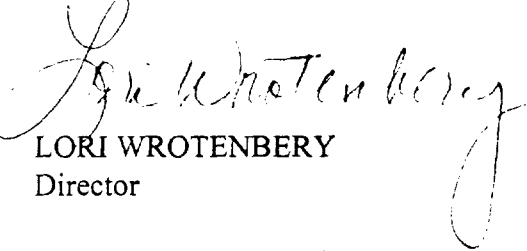
(13) The applicant shall conduct injection operations in accordance with Division Rules No. 701 through 708 and shall submit monthly progress reports in accordance with Division Rules Nos. 706 and 1115.

(14) The injection authority granted herein for the Vaca "13" Federal Well No. 2 shall terminate one year after the effective date of this order if the operator has not commenced injection operations into the well, provided however the Division, upon written request by the operator, may grant an extension thereof for good cause shown.

(15) Jurisdiction of this case 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

  
LORI WROTENBERY  
Director

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