

Entered July 2, 1980
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STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

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

CASE NO. 6890
Order No. R-6389

APPLICATION OF TENNECO OIL COMPANY
FOR A THERMAL ENHANCED RECOVERY
PROJECT, MCKINLEY COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 9 a.m. on May 7, 1980,
at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 7th day of July, 1980, the Division
Director, having considered the testimony, the record, and the
recommendations of the Examiner, and being fully advised in the
premises,

FINDS:

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

(2) That the applicant, Tenneco Oil Company, is the owner
and operator of the South Hospah Unit Area in the South Hospah-
Upper Sand Oil Pool, and of the Hospah Lease in the South Hospah-
Lower Sand Oil Pool, both in Section 12, Township 17 North, Range
9 West, NMPM, McKinley County, New Mexico.

(3) That the applicant proposes to institute a thermal
enhanced tertiary recovery project (fire flood) on said Hospah
Lease by the underground ignition of hydrocarbons in the South
Hospah-Lower Sand Oil Pool in a pilot area comprising some 0.68
acres in Unit G of Section 12, Township 17 North, Range 9 West,
NMPM.

(4) That primary development of the Lower Hospah pool on
the subject lease occurred from 1967 until 1972, at which time
a gas-water injection project was instituted.

(5) That said gas-water injection project was continued until 1976, when gas injection was terminated, but water injection into the Lower Hospah pool has been continued to date.

(6) That primary production from the Lower Hospah pool accounted for approximately 15 percent of the original oil in place and secondary recovery under the gas-water injection program and waterflood operations should yield an additional 19 percent of the original oil in place.

(7) That the 34 percent total production expected under primary and secondary recovery operations amounts to 3,255,000 barrels, of a total of approximately 9,575,000 barrels of original oil in place, and it is expected that the proposed thermal enhanced tertiary recovery project, if expanded to a field-wide operation, would add about 13 percent recovery to the pool, or 1,245,000 barrels.

(8) That the applicant proposes to drill an air injection well at a point approximately 1474 feet from the North line and 2725 feet from the East line of the aforesaid Section 12, said point being approximately midway between applicant's Lower Hospah Well No. 48 and its Upper Hospah Unit Well No. 18 (which will be recompleted in the Lower Hospah pool) and to also drill two additional wells, Nos. 65 and 66, which would be located immediately North and South of the air injection well at points 1350 feet from the North line and 2725 feet from the East line, and 1600 feet from the North line and 2725 feet from the East line, respectively, thereby creating a 0.68-acre pilot project area with one air injection well in the center and four producing wells, one each to the North, South, East, and West, thereof.

(9) That said wells would be cased through the Lower Hospah producing formation and would be cemented with a special high temperature-resistant cement.

(10) That the applicant proposes to inject approximately 500,000 cubic feet of air per day into the Lower Hospah pool through the aforesaid air injection well and to then ignite the oil in the reservoir by the injection and ignition of methane gas, creating a fire front which would advance through the reservoir, sweeping the unburned oil towards the producing wells by a wall of hot vapors advancing ahead of the fire front.

(11) That the applicant may also attempt to further stimulate production from the reservoir by a combination of such forward combustion and water injection.

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(12) That the feasibility of the proposed thermal enhanced tertiary recovery process has been proven in other reservoirs in other states, and should be determined in this State.

(13) That although some small percentage of the oil in place in the reservoir would be consumed by the advancing fire front, the proposed pilot fire flood, if successful, should result in the recovery of a substantial amount of otherwise unrecoverable oil reserves, thereby preventing waste.

(14) That provided the injection and producing wells are cased and cemented properly, and the injected air, methane and water are confined to the Lower Hospah producing sand, no impairment of water quality in any potable water sands should occur.

(15) That the proposed enhanced recovery project will not impair the correlative rights of any other interest owner in the Lower Hospah pool and should be approved.

(16) That the applicant also proposes to inject air into the Upper Hospah pool through the proposed air injection well which will have two strings of casing cemented therein, one open to the upper pool and one open to the lower pool.

(17) That said injection into the upper pool would be for test purposes only, and no ignition of hydrocarbons is planned for said Upper Hospah pool at this time.

(18) That said air injection into the Upper Hospah pool will not cause waste nor impair correlative rights and should be approved.

(19) That the proposed air injection well and producing Wells Nos. 65 and 66 would be at unorthodox locations, but such unorthodox locations will neither cause waste nor impair correlative rights and should be approved.

(20) That the applicant proposes a maximum surface injection pressure for the air injection well of approximately 1000 psi, and this proposed injection pressure will not fracture the confining strata and should be approved.

IT IS THEREFORE ORDERED:

(1) That the applicant, Tenneco Oil Company, is hereby authorized to institute a thermal enhanced tertiary recovery project in the South Hospah-Lower Sand Oil Pool, McKinley County,

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New Mexico, by the injection of air, gas, and water into one injection well to be located 1474 feet from the North line and 2725 feet from the East line of Section 12, Township 17 North, Range 9 West, NMPM, and by the ignition of hydrocarbons in situ around the injection well, and by the production of hydrocarbons from two existing wells, applicant's Well No. 48, located 1485 feet from the North line and 2817 feet from the East line, and Well No. 18, located 1600 feet from the North line and 3100 feet from the West line, and from two additional wells to be drilled, applicant's Well No. 65, to be located 1350 feet from the North line and 2725 feet from the East line, and Well No. 66, to be located 1600 feet from the North line and 2725 feet from the East line, all in the aforesaid Section 12.

(2) That the aforesaid wells to be drilled shall be cased through the Lower Hospah sand formation and shall be cemented with high temperature-resistant cement, provided however, that said cement shall be brought back to a point at least 100 feet above the top of the Upper Hospah sand formation.

(3) That allowable restrictions are hereby removed from wells in the pilot project area for the duration of the combustion and post-combustion life of the project.

(4) That injection of air and methane into the South Hospah-Lower Sand Oil Pool shall be limited to 1000 psi pressure at the wellhead and injection of water into said pool shall be limited to 800 psi pressure at the wellhead; that the Division Director is authorized to permit higher injection pressures upon adequate showing by the operator that no adverse effects would result.

(5) That the injection of air into the South Hospah-Upper Sand Oil Pool through the air injection well herein approved is hereby authorized, provided however, that such injection shall be at no more than 1000 psi pressure at the wellhead.

(6) That jurisdiction of this cause is retained for the entry of such further orders as the Division may deem necessary.

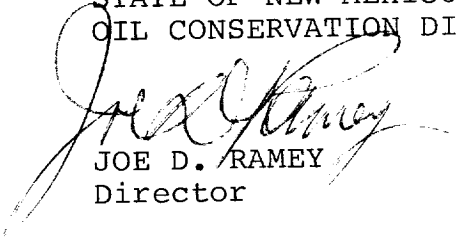
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DONE at Santa Fe, New Mexico, on the day and year herein-
above designated.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION



JOE D. RAMEY
Director

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