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. 10154
ORDER NO. R-9431

APPLICATION OF GREENHILL PETROLEUM
CORPORATION FOR WATERFLOOD EXPANSION,
LEA COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on November 14, 1990, and January 10, 1991 at Santa Fe, New Mexico, before Examiner David R. Catanach.

NOW, on this 7th day of February, 1991, 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) The applicant, Greenhill Petroleum Corporation, seeks authority to expand its Lovington San Andres Unit Waterflood Project, Lovington-San Andres Pool, by converting the 18 wells shown on Exhibit "A" attached hereto located in Townships 16 and 17 South, Ranges 36 and 37 East, NMPM, Lea County, New Mexico, to injection wells in the San Andres formation.

(3) The Lovington San Andres Unit Waterflood Project, approved by Division Order No. R-2278 on July 12, 1962, currently comprises the following described acreage in Lea County, New Mexico:

TOWNSHIP 16 SOUTH, RANGE 36 EAST, NMPM

Section 25: S/2 SE/4
Section 35: S/2 SE/4
Section 36: E/2, E/2 NW/4 and SW/4

TOWNSHIP 16 SOUTH, RANGE 37 EAST, NMPM

Section 31: Lots 1, 2, 3, 4, SE/4 NW/4, E/2 SW/4, SW/4 NE/4, and SE/4
Section 32: W/2 SW/4

TOWNSHIP 17 SOUTH, RANGE 36 EAST, NMPM

Section 1: Lots 1, 2, 3, 4, S/2 N/2, SE/4, N/2 SW/4, and SE/4 SW/4
Section 2: Lots 1, 2, S/2 NE/4, and N/2 SE/4

TOWNSHIP 17 SOUTH, RANGE 37 EAST, NMPM

Section 5: Lot 4
Section 6: Lots 1, 2, 3, 4, 5, 6 and SE/4 NW/4

(4) The applicant assumed operation of the subject waterflood project in December, 1891.

(5) The wells in the project area are in an advanced state of depletion and should be classified as "stripper" wells.

(6) The proposed expansion of the Lovington-San Andres Unit Waterflood Project should result in the recovery of otherwise unrecoverable oil, thereby preventing waste.

(7) The applicant should take all steps necessary to ensure that the injected water enters only 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.

(8) No surface injection pressure limitation was imposed on the project by said Order No. R-2278, and the evidence indicates that the former operator had been injecting water in project wells at pressures of up to 1,900 psi at the surface.

(9) The injection wells or pressurization system should be equipped with a pressure control device or acceptable substitute which will limit the surface injection pressure to no more than 0.2 psi per foot of depth to the top injection perforation, or in the case of open hole completions, the casing shoe, all as shown on Exhibit "A".

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

(11) There are 14 wells shown on Exhibit "B" attached hereto, which are located within the "area of review" which are not completed or cemented in such a manner which will assure that their wellbores will not serve as a conduit for movement of injected fluid out of the injection interval.

(12) Prior to initiating injection within one-half mile of any of the wells shown on Exhibit "B", the applicant should be required to perform remedial cement operations on said wells in a manner which will assure that these wellbores will not serve as a conduit for migration of injected fluid to the satisfaction of the supervisor of the Hobbs district office of the Division.

(13) There are 11 wells shown on Exhibit "C" attached hereto, which are located within the "area of review" which may not be completed or cemented in such a manner which will assure that their wellbores will not serve as a conduit for movement of injected fluid out of the injection interval.

(14) Prior to initiating injection within one-half mile of any of the wells shown on Exhibit "C", the applicant should be required to demonstrate by cement bond log or other acceptable means that these wellbores will not serve as a conduit for migration of injected fluid out of the injection interval.

(15) If any of the wells shown on Exhibit "C" are found inadequate to confine the injected fluid to the injection interval the applicant should be required, prior to initiating injection within one-half mile of any of these wells, to perform remedial cement operations on said wells in a manner which will assure that these wellbores will not serve as a conduit for migration of injected fluid to the satisfaction of the supervisor of the Hobbs district office of the Division.

(16) There are five wells, shown on Exhibit "D" attached hereto, which are located within the "area of review" which may not be plugged in such a manner which will assure that their wellbores will not serve as a conduit for movement of injected fluid out of the injection interval.

(17) Prior to initiating injection operations within one-half mile of any of the wells shown on Exhibit "D", the applicant should be required to re-plug said wells in a manner which will assure that these wellbores will not serve as a conduit for migration of injected fluid to the satisfaction of the supervisor of the Hobbs district office of the Division.

(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 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, of the mechanical integrity pressure tests, and of the conductance of any remedial cement or plugging operations in order that the same may be witnessed.

(20) The application 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.

IT IS THEREFORE ORDERED THAT:

(1) The applicant, Greenhill Petroleum Corporation, is hereby authorized to expand its Lovington San Andres Unit Waterflood Project, Lovington-San Andres Pool, Lea County, New Mexico, by the injection of water into the San Andres formation through the 18 injection wells shown on Exhibit "A" attached hereto.

(2) Prior to initiating injection within one-half mile of any of the wells shown on Exhibit "B", the applicant shall perform remedial cement operations on said wells in a manner which will assure that these wellbores will not serve as a conduit for migration of injected fluid to the satisfaction of the supervisor of the Hobbs district office of the Division.

(3) Prior to initiating injection within one-half mile of any of the wells shown on Exhibit "C", the applicant shall demonstrate by cement bond log or other acceptable means that these wellbores will not serve as a conduit for migration of injected fluid out of the injection interval.

(4) If any of the wells shown on Exhibit "C" are found inadequate to confine the injected fluid to the injection interval the applicant shall, prior to initiating injection within one-half mile of any of these wells, perform remedial cement operations on said wells in a manner which will assure that these wellbores will not serve as a conduit for migration of injected fluid to the satisfaction of the supervisor of the Hobbs district office of the Division.

(5) Prior to initiating injection operations within one-half mile of any of the wells shown on Exhibit "D", the applicant shall re-plug said wells in a manner which will assure that these wellbores will not serve as a conduit for migration of injected fluid to the satisfaction of the supervisor of the Hobbs district office of the Division.

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

(7) Injection into the proposed injection wells shall be accomplished through 2 3/8-inch plastic-lined tubing installed in a packer set approximately within 100 feet of the uppermost injection perforation or casing shoe; 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.

(8) The injection wells or pressurization system shall be equipped with a pressure control device or acceptable substitute which will limit the surface injection pressure to no more than 0.2 psi per foot of depth to the top injection perforation, or in the case of open hole completions, the casing shoe, all as shown on Exhibit "A".

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

(10) Prior to commencing injection operations into the proposed injection wells, the casing in each 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.

(11) 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, of the mechanical integrity pressure tests, and of the conductance of any remedial cement or plugging operations in order that the same may be witnessed.

(12) 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.

(13) 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.

(14) 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 COMMISSION

WILLIAM J. LEMAY, Director

EXHIBIT "A"
GREENHILL PETROLEUM CORPORATION
LOVINGTON SAN ANDRES UNIT
CASE NO. 10154
ORDER NO. R-9431

Well Number	*Location*	*Unit*	*S-T-R*	*Injection Perforations*	*Packer Depth*	*Tubing Size*	*Injection Pressure*
3	660' FNL - 1980' FEL	B	36-16S-36E	4618 - 5090	4598	2 3/8"	924
5	660' FNL - 600' FEL	A	36-16S-36E	4625 - 5130	4605	2 3/8"	925
10	1980' FNL - 1980' FEL	G	36-16S-36E	4600 - 5110	4580	2 3/8"	920
12	1980' FSL - 1980' FWL	K	36-16S-36E	4580 - 5055	4560	2 3/8"	916
13	1760' FSL - 440' FEL	I	36-16S-36E	4518 - 5068	4495	2 3/8"	904
25	660' FSL - 1980' FEL	O	36-16S-36E	4515 - 5090	4495	2 3/8"	903
57	660' FSL - 660' FWL	M	36-16S-36E	4640 - 5144	4620	2 3/8"	928
7	1980' FNL - 1980' FEL	G	31-16S-37E	4620 - 4990	4530	2 3/8"	924
15	1650' FSL - 1650' FWL	K	31-16S- 37E	4531 - 5110	4510	2 3/8"	906
17	1980' FSL - 990' FEL	I	31-16S-37E	4623 - 5090	4603	2 3/8"	925
58	2310' FNL - 990' FWL	E	31-16S-37E	4570 - 5070	4550	2 3/8"	914
31	660' FNL - 1980' FWL	C	1-17S-36E	4541 - 5125	4499	2 3/8"	908
43	1980' FNL - 660' FWL	E	1-17S-36E	4546 - 5030	4536	2 3/8"	909
40	1980' FNL - 660' FEL	H	1-17S-36E	4579 - 4950	4519	2 3/8"	916
45	1980' FNL - 1980' FEL	G	2-17S-36E	4577 - 5147	4527	2 3/8"	915
37	330' FNL - 990' FEL	A	6-17S-37E	4560 - 5030	4510	2 3/8"	912
35	339' FNL - 1890' FWL	C	6-17S-37E	4570 - 5040	4520	2 3/8"	914
39	1985' FNL - 616' FWL	E	6-17S-37E	4522 - 4975	4570	2 3/8"	904

EXHIBIT "B"
CASE NO. 10154
ORDER NO. R-9431

Operator	*Lease*	*Well No.*	*Location*	*Sec-Twp-Rge*
Greenhill Petroleum Corp.	Lovington Paddock Ut.	7	330' FSL - 330' FEL	25-16-36
Greenhill Petroleum Corp.	Lovington Paddock Ut.	13	880' FNL - 330' FWL	36-16-36
Greenhill Petroleum Corp.	Lovington Paddock Ut.	29	2130' FSL - 2130' FWL	36-16-36
Greenhill Petroleum Corp.	Lovington Paddock Ut.	41	810' FSL - 2130' FWL	36-16-36
Greenhill Petroleum Corp.	Lovington Paddock Ut.	57	1980' FNL - 695' FEL	06-17-37
Texaco Producing Inc.	State P	3	800' FSL - 330' FWL	32-16-37
Amerada Hess	State L "A"	8	560' FNL - 660' FEL	01-17-36
Amerada Hess	State L "A"	9	660' FNL - 1880'FEL	01-17-36
Amerada Hess	State L "A"	10	1650' FNL - 660' FEL	01-17-36
Amerada Hess	State L "A"	11	1650' FNL - 1980' FEL	01-17-36
Amerada Hess	State L "A"	12	2310' FSL - 2310' FWL	01-17-36
Penroc	State "E" TR 18	17	1650' FNL - 2310' FWL	01-17-36
Penroc	State "E" TR 18	19	1650' FNL - 990' FWL	01-17-36
Penroc	State AE	1	330' FSL - 990' FWL	36-16-36

EXHIBIT "C"
CASE NO. 10154
ORDER NO. R-9431

Operator	*Lease*	*Well No.*	*Location*	*Sec-Twp-Rge*
Greenhill Petroleum Corp.	Lovington Paddock Ut.	18	2310' FNL - 330' FEL	35-16-36
Greenhill Petroleum Corp.	Lovington Paddock Ut.	32	1750' FSL - 1650' FEL	36-16-36
Greenhill Petroleum Corp.	Lovington Paddock Ut.	39	810' FSL - 660' FEL	36-16-36
Greenhill Petroleum Corp.	Lovington Paddock Ut.	40	810' FSL - 1980' FEL	36-16-36
Greenhill Petroleum Corp.	Lovington Paddock Ut.	10	660' FNL - 2440' FEL	31-16-37
Greenhill Petroleum Corp.	Lovington Paddock Ut.	33	1650' FSL - 430' FEL	36-16-36
Greenhill Petroleum Corp.	Lovington Paddock Ut.	67	2310' FSL - 660' FWL	06-17-37
Texaco Producing Inc.	State P	4	1650' FNL - 990' FWL	32-16-37
Texaco Producing Inc.	State O	10	3080' FNL - 440' FWL	31-16-37
Texaco Producing Inc.	State P	2	1980' FSL - 380' FWL	32-16-37
Texaco Producing Inc.	C. S. Caylor	4	2179' FNL - 2173' FEL	06-17-37

EXHIBIT "D"
CASE NO. 10154
ORDER NO. R-9431

INADEQUATELY PLUGGED AND ABANDONED WELLS

Operator	*Lease*	*Well No.*	*Location*	*Sec-Twp-Rge*
Tidewater Associated Oil Co.	H.T. Monteith	1	1650' FSL - 2335' FWL	25-16-36
Cities Service	State AE	2	3630' FNL - 4290' FEL	36-16-36
Getty Oil Co.	State "M"	3	1650' FSL - 1650' FEL	36-16-36
Getty Oil Co.	State "P"	5	330' FSL - 330' FWL	32-16-37
Magnolia Petroleum Co.	State "R"	3	660' FNL - 660' FEL	02-17-36