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. 6366
Order No. R-5871

APPLICATION OF PHILLIPS PETROLEUM
COMPANY FOR STATUTORY UNITIZATION,
LEA COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 9 a.m. on October 25, 1978, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 27th day of November, 1978, 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, Phillips Petroleum Company, seeks the statutory unitization, pursuant to the "Statutory Unitization Act," Sections 65-14-1 through 65-14-21, NMSA, 1953 Compilation, of 7,025.3 acres, more or less, of State lands, being a portion of the Vacuum Grayburg-San Andres Pool, Lea County, New Mexico, and approval of the plan of unitization and the proposed operating plan.

(3) That the proposed unit area would be designated the East Vacuum Grayburg-San Andres Unit Area; that the vertical limits of said unit area would be the subsurface formation commonly known as the Grayburg-San Andres formation identified between the depths of 4,050 feet (103 feet sub-sea) and 5,050 feet (1103 feet sub-sea) on the Lane Wells Acoustilog, Run No. 1, dated April 14, 1964, in Exxon's New Mexico State "K" Well No. 19, located in the SE/4 SE/4 of Section 28, Township 17 South, Range 35 East, NMPM, Lea County, New Mexico, and is to include all subsurface points throughout the Unit area correlative to those identified depths, and that the unit area would comprise the following described lands:

TOWNSHIP 17 SOUTH, RANGE 34 EAST, NMPM
Section 24: SE/4

TOWNSHIP 17 SOUTH, RANGE 35 EAST, NMPM
Section 18: W/2 SW/4 and SE/4 SW/4
Section 19: W/2, S/2 NE/4, and SE/4
Section 20: W/2 NW/4, SE/4 NW/4, SW/4, SW/4 NE/4, W/2 SE/4 and SE/4 SE/4
Section 21: SW/4 SW/4, E/2 SW/4, and SE/4
Section 22: SW/4, W/2 SE/4, and SE/4 SE/4
Section 23: S/2 SW/4
Section 24: SW/4 SW/4
Section 25: W/2 NW/4
Section 26: N/2, SW/4, W/2 SE/4, and NE/4 SE/4
Sections 27, 28, and 29: All
Section 31: N/2 SE/4 and SE/4 SE/4
Sections 32 and 33: All
Section 34: N/2, SW/4, and NW/4 SE/4
Section 35: N/2 NW/4

TOWNSHIP 18 SOUTH, RANGE 35 EAST, NMPM
Section 4: N/2 NW/4 and NW/4 NE/4
Section 5: N/2 and NW/4 SW/4

(4) That the portion of the Vacuum Grayburg-San Andres Pool proposed to be included in the aforesaid East Vacuum Grayburg-San Andres Unit Area has been reasonably defined by development.

(5) That the applicant proposes to institute a pressure maintenance project for the secondary recovery of oil and gas in the proposed unit area.

(6) That the unitized management, operation and further development of the subject portion of the Vacuum Grayburg-San Andres Pool, as proposed, is reasonably necessary in order to effectively carry on secondary recovery operations and to substantially increase the ultimate recovery of oil from the pool.

(7) That the proposed unitized method of operation as applied to the East Vacuum Grayburg-San Andres Unit Area is feasible, will prevent waste, and will result with reasonable probability in the increased recovery of substantially more oil from the pool than would otherwise be recovered.

(8) That the estimated additional costs of such operations will not exceed the estimated value of the additional oil so recovered plus a reasonable profit.

(9) That such unitization and adoption of the proposed unitized method of operation will benefit the working interest owners and royalty owners of the oil and gas rights within the East Vacuum Grayburg-San Andres Unit Area.

(10) That the applicant has made a good faith effort to secure voluntary unitization within the Vacuum Grayburg-San Andres Pool.

(11) That the participation formula contained in the unitization agreement allocates the produced and saved unitized hydrocarbons to the separately owned tracts in the unit area on a fair, reasonable and equitable basis, and protects the correlative rights of all owners of interest within the unit area.

(12) That applicant's Exhibits Nos. 1 and 2 in this case, being the Unit Agreement and the Unit Operating Agreement should be incorporated by reference into this order.

(13) That applicant's Exhibit No. 2 in this case, being the Unit Operating Agreement, should be amended by the addition thereto of Exhibit "G", being applicant's Exhibit No. 13 in this case and entitled "Business Ethics Policy Compliance."

(14) That the Statutory Unitization of the East Vacuum Grayburg-San Andres Unit Area, in conformance to the above findings, will prevent waste and protect correlative rights and should be approved.

IT IS THEREFORE ORDERED:

(1) That the East Vacuum Grayburg-San Andres Unit Agreement, covering 7025.3 acres, more or less, of State lands in the Vacuum Grayburg-San Andres Pool, Lea County, New Mexico, is hereby approved for statutory unitization pursuant to the Statutory Unitization Act, Sections 65-14-1 through 65-14-21, NMSA, 1953 Compilation.

(2) That the lands covered by said East Vacuum Grayburg-San Andres Unit Agreement shall be designated the East Vacuum Grayburg-San Andres Unit Area and shall comprise:

TOWNSHIP 17 SOUTH, RANGE 34 EAST, NMPM
Section 24: SE/4

TOWNSHIP 17 SOUTH, RANGE 35 EAST, NMPM
Section 18: W/2 SW/4 and SE/4 SW/4
Section 19: W/2, S/2 NE/4, and SE/4
Section 20: W/2 NW/4, SE/4 NW/4, SW/4, SW/4 NE/4, W/2 SE/4, and SE/4 SE/4
Section 21: SW/4 SW/4, E/2 SW/4 and SE/4
Section 22: SW/4, W/2 SE/4, and SE/4 SE/4
Section 23: S/2 SW/4
Section 24: SW/4 SW/4
Section 25: W/2 NW/4
Section 26: N/2, SW/4, W/2 SE/4, and NE/4 SE/4
Sections 27, 28, and 29: All
Section 31: N/2 SE/4 and SE/4 SE/4
Sections 32 and 33: All
Section 34: N/2, SW/4, and NW/4 SE/4
Section 35: N/2 NW/4

TOWNSHIP 18 SOUTH, RANGE 35 EAST, NMPM
Section 4: N/2 NW/4 and NW/4 NE/4
Section 5: N/2 and NW/4 SW/4

(3) That the vertical limits of the East Vacuum Grayburg-San Andres Unit Area shall be the Grayburg-San Andres formation identified between the depths of 4,050 feet (103 feet sub-sea) and 5,050 feet (1103 feet sub-sea) on the Lane Wells Acoustilog, Run No. 1, dated April 14, 1964, in Exxon's New Mexico State "K" Well No. 19, located in the SE/4 SE/4 of Section 28, Township 17 South, Range 35 East, NMPM, Lea County, New Mexico, and is to include all subsurface points throughout the Unit area correlative to those identified depths.

(4) That applicant's Exhibit No. 1 in this case, being the East Vacuum Grayburg-San Andres Unit Agreement, is hereby incorporated by reference into this order.

(5) That applicant's Exhibit No. 2 in this case, being the East Vacuum Grayburg-San Andres Unit Operating Agreement, as amended by the addition thereto of "Exhibit G, Business Ethics Policy Compliance," being applicant's Exhibit No. 13 in this case, is hereby incorporated by reference into this order.

(6) That the East Vacuum Grayburg-San Andres Unit Agreement and the East Vacuum Grayburg-San Andres Unit Operating Agreement provide for unitization and unit operation of the subject portion of the Vacuum Grayburg-San Andres Pool upon terms and conditions that are fair, reasonable and equitable and include:

an allocation to the separately owned tracts in the unit area of all the oil and gas that is produced from the unit area and is saved, being the production that is not used in the conduct of operations on the unit area or not unavoidably lost;

a provision for the credits and charges to be made in the adjustment among the owners in the unit area for their respective investments in wells, tanks, pumps, machinery, materials and equipment contributed to the unit operations;

a provision governing how the costs of unit operations including capital investments shall be determined and charged to the separately owned tracts and how said costs shall be paid including a provision providing when, how, and by whom the unit production allocated to an owner who does not pay the share of the costs of unit operations charged to such owner, or the interest of such owner, may be sold and the proceeds applied to the payment of such costs;

a provision for carrying any working interest owner on a limited, carried or net-profits basis, payable out of production, upon such terms and conditions determined by the Division Director to be just and reasonable, and allowing an appropriate charge for interest for such service payable out of such owner's share of production, provided that any nonconsenting working interest owner being so carried shall be deemed to have relinquished to the unit operator all of its operating rights and working interest in and to the unit until his share of the costs, service charge and interest are repaid to the unit operator;

a provision designating the unit operator and providing for the supervision and conduct of the unit operations, including the selection, removal or substitution of an operator from among the working interest owners to conduct the unit operations;

a provision for a voting procedure for the decision of matters to be decided by the working interest owners in respect to which each working interest owner shall have a voting interest equal to its unit participation; and

the time when the unit operation shall commence and the manner in which, and the circumstances under which, the operations shall terminate and for the settlement of accounts upon such termination;

and are therefore hereby adopted.

(7) That this order shall not become effective unless and until the appropriate ratification provisions of Section 65-14-8, NMSA, 1953 Compilation, are complied with.

(8) That if the persons owning the required percentage of interest in the unit area as set out in Section 65-14-8, NMSA, 1953 Compilation, do not approve the plan for unit operations within a period of six months from the date of entry of this order, this order shall cease to be of further force and effect and shall be revoked by the Division, unless the Division shall extend the time for ratification for good cause shown.

(9) That the persons owning the required percentage of interest in the unit area have approved the plan for unit operations and the interests of all persons in the unit are unitized whether or not such persons have approved the plan of unitization in writing.

(10) That 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

JOE D. RAMEY
Director

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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. 6367
Order No. R-5897

APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR A PRESSURE MAINTENANCE PROJECT, LEA COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 9 a.m. on October 25, 1978, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 16th day of January, 1979, 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 by Division Order No. R-5871 dated November 27, 1978, statutory unitization was approved for the East Vacuum Grayburg-San Andres Unit Area, Lea County, New Mexico.

(3) That the applicant herein, Phillips Petroleum Company, seeks authority to institute a pressure maintenance project on the aforesaid East Vacuum Grayburg-San Andres Unit Area, Vacuum Grayburg-San Andres Pool, Lea County, New Mexico, by the injection of water into the San Andres formation through 59 wells, 31 of which would be drilled in 1979 during Phase II of the Project Development Program and 28 of which would be drilled in 1980 during Phase III of the Development Program.

(4) Applicant further seeks the designation of a project area for said pressure maintenance project and the promulgation of special rules and regulations governing said project including special allowable provisions.

(5) That for Phase I of the Project Development Program, applicant proposes to drill during 1979 ten producing wells at unorthodox locations as specified below:

TRACT NO.	WELL NO.	LOCATION	UNIT	SECTION
3229	005	1310' FSL and 1310' FWL	M	32
3202	001	1310' FSL and 1330' FEL	O	32
3202	003	1330' FNL and 1330' FEL	G	32
3328	002	1310' FSL and 1310' FWL	M	33
3366	001	1330' FNL and 1310' FWL	E	33
3333	004	1330' FNL and 1330' FEL	G	33
3456	005	1330' FNL and 1310' FWL	E	34
2801	002	1310' FSL and 1310' FWL	M	28
2801	004	1310' FSL and 1330' FEL	O	28
2721	001	1310' FSL and 1310' FWL	M	27

all in Township 17 South, Range 35 East, NMPM, Lea County, New Mexico.

(6) That during Phase II of the Development Program applicant proposes to drill 18 additional producing wells, all at unorthodox locations, and during Phase III of the Program applicant proposes to drill 26 additional producing wells, also at unorthodox locations.

(7) That all of the wells referred to in Findings Nos. (3), (5) and (6) above, being 59 injection wells at unorthodox locations and 54 producing wells at unorthodox locations, together with the currently completed producing wells in the Unit Area, will provide a thorough and efficient sweep of hydrocarbons throughout the unitized area, and will result in the recovery of otherwise unrecoverable oil, thereby preventing waste.

(8) That the above-described injection and producing wells, some of which would be at unorthodox locations along the unit boundaries in accordance with lease-line agreements with operators of offsetting lands, will not impair but will protect correlative rights.

(9) That the applicant's request for the designation of a Pressure Maintenance Project for the East Vacuum Grayburg-San Andres Unit Area, and for the promulgation of special rules and regulations governing said project, is in the interest of conservation and should be approved, subject to certain provisions.

(10) That the project area should consist of those proration units within the boundary of the East Vacuum Grayburg-San Andres Unit upon which is located an injection well and any directly or diagonally offsetting proration unit which contains a producing well.

(11) That the total project area allowable should be equal to the sum of the basic project area allowable plus the water injection credit allowable.

(12) That the basic project area allowable should be equal to 80 barrels of oil per day times the number of developed 40-acre proration units in the project area.

(13) That the water injection credit allowable should be based on the following formula:

$$\text{Water Injection Credit Allowable} = \left[\frac{\text{net water injected}}{\text{basic project area allowable voidage}}\right] \times \text{basic project area allowable}$$

and should be calculated in accordance with Exhibits "A" and "B" attached hereto and by reference made a part hereof.

(14) That the project area allowable should be produced from the wells within the project area in any proportion provided that any proration unit situated on the boundary of said East Vacuum Unit which proration unit is not directly or diagonally offset by a San Andres injection well outside the Unit or on the Unit boundary should not be permitted to produce in excess of 80 barrels of oil per day.

(15) That each of the newly drilled production or injection wells in the project should be equipped with surface casing set at approximately 350 feet and cemented to the surface and with "production" casing set at total depth, approximately 4900 feet.

(16) That the "production" casing on each of said newly drilled wells should be cemented to the surface, except that in any well in which an intermediate casing string has been run to below the top of the Yates formation and cemented to the surface, the "production" casing may be cemented back into the base of the intermediate casing string.

(17) That injection should be accomplished through tubing installed in a packer set within 100 feet of the uppermost perforation. The injection tubing should be corrosion protected by a non-reactive internal lining or coating. The casing-tubing

annulus in each injection well should be filled with an inert fluid and a surface pressure gauge or approved leak detection device should be attached to the annulus.

(18) The injection wells or 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 uppermost perforation. Provision should be made for the Division Director to administratively authorize a pressure limitation in excess of the above upon showing by the Unit Operator that such higher pressure will not result in fracturing of the confining strata.

(19) All wells within the project area should be equipped with risers or in some other acceptable manner as to facilitate the periodic testing of the bradenhead for pressure or fluid production.

(20) That provision should be made for the Division Director to authorize placing wells on injection and the drilling of injection wells and additional producing wells at orthodox and unorthodox locations anywhere within the Unit Area without notice and hearing, provided that no unorthodox location is closer than ten feet to a quarter-quarter section line nor closer than 330 feet to the unit boundary, unless such well located closer than 330 feet to the unit boundary is covered by a lease-line agreement with the operator of the lands offsetting such well or the owner of the offsetting lands has waived objection to such location in writing.

(21) That there are a number of wells within the East Vacuum Grayburg-San Andres Unit Area and on lands offsetting the unit area which have previously been plugged and abandoned in a manner which may permit waters injected into the San Andres formation to escape into other formations, including the Salado formation and the shallow fresh water-bearing formations unless remedial action is taken on said wells prior to injection in their near vicinity.

(22) That there are a number of wells within the East Vacuum Grayburg-San Andres Unit Area and on lands offsetting the unit area which penetrate the Vacuum Grayburg-San Andres Pool and are completed in deeper pay zones, but which are cased and cemented in such a manner as may permit the escape of waters injected into the San Andres formation into other formations as described above.

(23) That those wells referred to in Findings Nos. (21) and (22) above which are inadequately plugged and abandoned or are inadequately cased and cemented, or are suspected of being so, include, but are not necessarily limited to, the wells listed in Exhibit "C" attached hereto and by reference made a part hereof.

(24) That no injection at greater than hydrostatic pressure should be made into the Grayburg or San Andres formation in any well in the East Vacuum Grayburg-San Andres Unit Area within one-half mile of any well listed on Exhibit "C" attached hereto until remedial action has been taken on such well to ensure that it will not serve as an avenue of escape for injected waters or until tests have been conducted on such well or other evidence concerning such well has been presented, all establishing to the satisfaction of the Supervisor of the Hobbs District Office of the Division that remedial work on such well is unnecessary.

IT IS THEREFORE ORDERED:

(1) That the applicant, Phillips Petroleum Company, is hereby authorized to institute and operate a pressure maintenance project in the East Vacuum Grayburg-San Andres Unit Area, Vacuum Grayburg-San Andres Pool, Lea County, New Mexico, by the injection of water into the San Andres formation through certain wells which will be administratively approved for water injection at some later date by the Division Director.

(2) That said project shall be designated the East Vacuum Unit Pressure Maintenance Project.

(3) That the following unorthodox locations are hereby approved for new producing wells which are to be drilled by the unit operator during Phase I of the Project Development Program:

TRACT NO.	WELL NO.	LOCATION	UNIT	SECTION
3229	005	1310' FSL and 1310' FWL	M	32
3202	001	1310' FSL and 1330' FEL	O	32
3202	003	1330' FNL and 1330' FEL	G	32
3328	002	1310' FSL and 1310' FWL	M	33
3366	001	1330' FNL and 1310' FWL	E	33
3333	004	1330' FNL and 1330' FEL	G	33
3456	005	1330' FNL and 1310' FWL	E	34
2801	002	1310' FSL and 1310' FWL	M	28
2801	004	1310' FSL and 1330' FEL	O	28
2721	001	1310' FSL and 1310' FWL	M	27

all in Township 17 South, Range 35 East, NMPM, Lea County, New Mexico.

(4) That Special Rules and Regulations governing the East Vacuum Unit Pressure Maintenance Project are hereby promulgated as follows:

SPECIAL RULES AND REGULATIONS
FOR THE
EAST VACUUM UNIT PRESSURE MAINTENANCE PROJECT

RULE 1. The project area of the East Vacuum Unit Pressure Maintenance Project shall consist of those proration units within the boundaries of the East Vacuum Grayburg-San Andres Unit upon which is located an injection well and any directly or diagonally offsetting proration unit which contains a producing well.

RULE 2. The project area shall receive a project area allowable, and said project area allowable shall be the sum of the basic project area allowable plus the water injection credit allowable.

RULE 3. The basic project area allowable shall be equal to 80 barrels of oil per day times the number of developed 40-acre proration units in the project area.

RULE 4. The water injection credit allowable shall be contingent upon full reservoir voidage replacement of all produced fluids and shall be based upon the following formula:

$$\text{Water Injection Credit Allowable} = \left[\frac{\text{Net Water Injected}}{\text{Basic Project Area Allowable Reservoir Voidage}}\right]^{-1} \times \text{Basic Project Area Allowable}$$

The water injection credit allowable shall be calculated in accordance with the procedures and parameters depicted on Exhibits "A" and "B" to Order No. R-5897.

In no event shall the water injection credit allowable be less than zero, i.e., negative numbers derived from application of the above formula shall be ignored.

RULE 5. The weighted average project area reservoir pressure shall be determined prior to commencement of injection of water into the reservoir and at least annually thereafter. The weighted average project area pressure shall be determined from the pressures in at least ten representative wells selected by the unit operator and the Supervisor of the Hobbs District Office of the Division.

RULE 6. The project area allowable may be produced from the wells within the project area in any proportion provided, however, that any proration unit situated on the boundary of the East Vacuum Unit which proration unit is not directly or diagonally offset by a San Andres injection well outside said East Vacuum Unit or on the East Vacuum Unit boundary shall not be permitted to produce in excess of 80 barrels of oil per day.

RULE 7. Those wells within the East Vacuum Unit Area that are not included within the project area as defined above shall be prorated in accordance with the Rules and Regulations of the Division.

RULE 8. The Division Director shall have authority to approve, without notice and hearing, the drilling of wells at unorthodox locations anywhere within the unit boundary, provided however, no unorthodox location shall be closer than ten feet to any quarter-quarter section line, and provided further, that no such unorthodox location shall be closer than 330 feet to the outer boundary of the unit area, unless such well is covered by a lease-line agreement with the operator of the lands offsetting such well, and a copy of the lease-line agreement accompanies the application for such unorthodox location, or unless such offset operator has waived objection to the proposed unorthodox location in writing, and his waiver accompanies the application.

RULE 9. No well shall be placed on water injection in the East Vacuum Unit Area unless the Division Director has approved such well for injection. Applications for injection approval shall be filed in accordance with Rule 701 of the Division Rules and Regulations.

RULE 10. Each newly drilled injection or producing well shall be equipped with a minimum of 350 feet of surface casing and "production" casing run to total depth (approximately 4900 feet). All casing strings shall be cemented to the surface except that in any well in which an intermediate casing string has been run to below the top of the Yates formation and cemented to the surface, the "production" string may be cemented back into the base of the intermediate casing.

RULE 11. Injection shall be accomplished through tubing installed in a packer set within 100 feet of the uppermost perforation. The injection tubing shall be corrosion protected by a non-reactive internal lining or coating. The casing-tubing annulus in each injection well shall be filled with an inert fluid and a surface pressure gauge or approved leak detection device shall be attached to the annulus.

RULE 12. The injection wells or 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 uppermost perforation. The Division Director may administratively authorize a pressure limitation in excess of the above upon showing by the unit operator that such higher pressure will not result in fracturing of the confining strata.

RULE 13. All wells within the project area shall be equipped with risers or in some other acceptable manner as to facilitate the periodic testing of the bradenhead for pressure or fluid production.

RULE 14. The unit operator shall immediately notify the Supervisor of the Hobbs District Office of the Division of the failure of the tubing or packer in any of said injection wells, the leakage of water or oil from or around any producing well, the leakage of water or oil from or around any plugged and abandoned well within the project area, or any other evidence of fluid migration from the injection zone, and shall take such timely steps as may be necessary or required to correct such failure or leakage.

RULE 15. Each month the project operator shall submit to the Division a Pressure Maintenance Project Operator's Report, on a form prescribed by the Division, outlining thereon the data required and requesting allowables for each of the several wells in the Project as well as the total project area allowable.

RULE 16. The Division shall, upon review of the report and after any adjustments deemed necessary, calculate the allowable for the wells in the Project for the next succeeding month in accordance with these rules. The sum of the allowables so calculated shall be assigned to the Project and, except as provided under Rule 6 above, may be produced from the wells in the Project in any proportion.

IT IS FURTHER ORDERED:

(1) That no injection at greater than hydrostatic pressure shall be made into the Grayburg or San Andres formation in any well in the East Vacuum Grayburg-San Andres Unit Area within one-half mile of any well listed on Exhibit "C" attached hereto until remedial action has been taken on such well to ensure that it will not serve as an avenue of escape for injected waters, or until tests have been conducted on such well or other evidence concerning such well has been presented

establishing to the satisfaction of the Supervisor of the Hobbs District Office of the Division that remedial work on such well is unnecessary.

(2) That Order No. R-3150 which authorized a pilot waterflood project in this area is hereby rescinded.

(3) That 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

JOE D. RAMEY
Director

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EAST VACUUM GRAYBURG-SAN ANDRES UNIT
PRESSURE MAINTENANCE PROJECT

VACUUM GRAYBURG-SAN ANDRES POOL, LEA COUNTY, NEW MEXICO

WATER INJECTION CREDIT ALLOWABLE CALCULATION DATA

ATTACHMENT TO _____, 19__, REPORT

$$\text{Water Injection Credit Allowable} = \left[\frac{W_i - W_p}{\text{BPAA} \left[B_o + \frac{(R_p - R_s)}{(1{,}000)} B_g \right]} - 1 \right] \text{BPAA}$$

W_i = _____ = Average daily water injection, barrels per day, project area only.

W_p = _____ = Average daily water produced, barrels per day, project area only.

BPAA = _____ = Basic project area allowable, 80 bopd x _____ (number of developed 40-acre tracts in project area).

_____ = Weighted average project area reservoir pressure, psig, from _____, 19__, survey data.

B_o = _____ = Oil formation volume factor, reservoir barrels per stock tank barrel (Exhibit B).

R_p = _____ = Producing gas-oil ratio, cubic feet per barrel, project area only.

R_s = _____ = Solution gas-oil ratio, cubic feet per barrel (Exhibit B).

B_g = _____ = Gas formation volume factor, reservoir barrels per Mcf (Exhibit B).

Water injection credit allowable for _____, 19__, = _____ barrels of oil per day.

EXHIBIT "A"
ORDER NO. R-5897

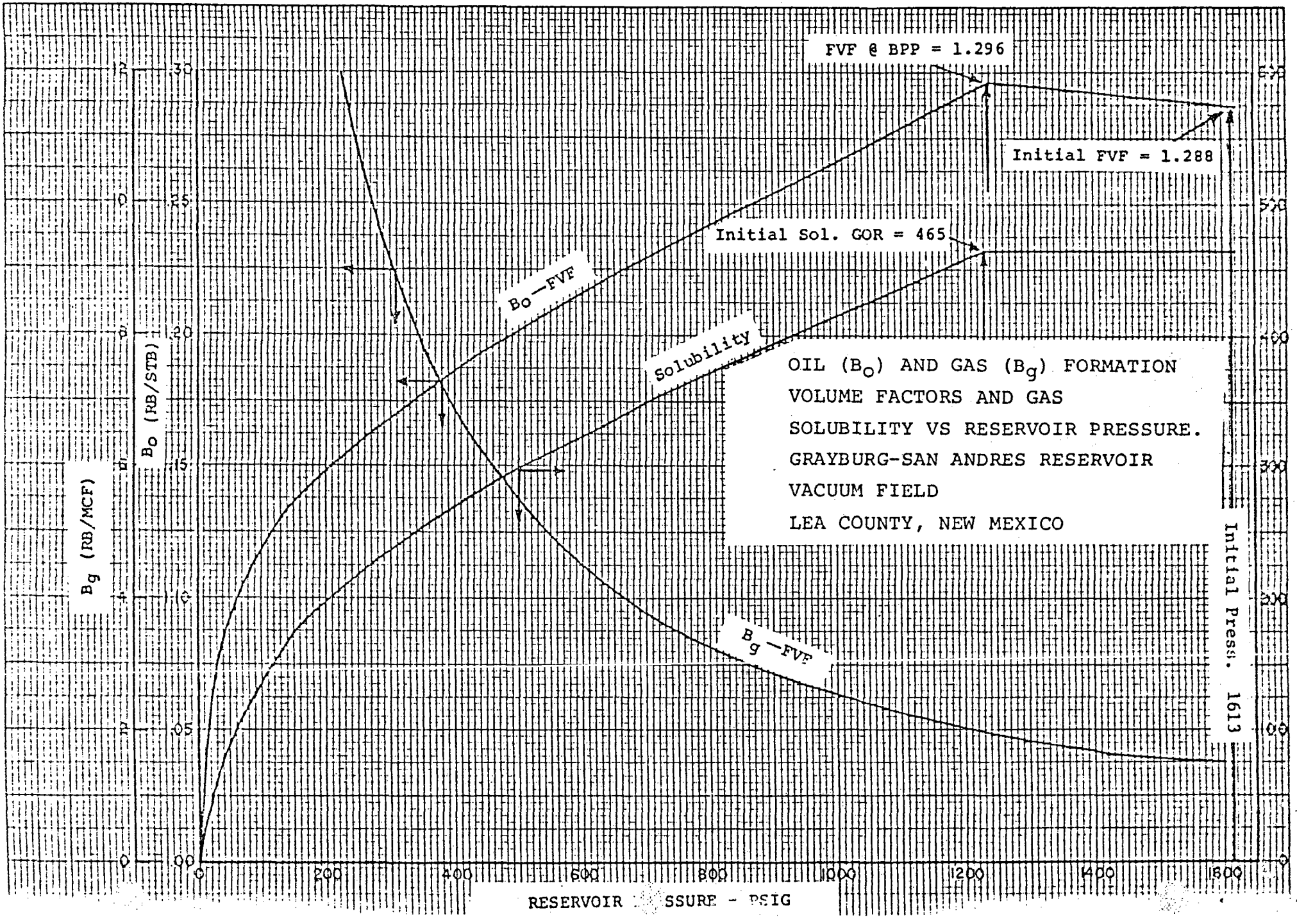

FVF @ BPP = 1.296
Initial FVF = 1.288
Initial Sol. GOR = 465
Bo — FVF
Solubility
Bg — FVF
OIL (B_o) AND GAS (B_g) FORMATION VOLUME FACTORS AND GAS SOLUBILITY VS RESERVOIR PRESSURE.
GRAYBURG-SAN ANDRES RESERVOIR
VACUUM FIELD
LEA COUNTY, NEW MEXICO
Initial Press. 1613
Bg (RB/MCF)
Bo (RB/STB)
RESERVOIR PRESSURE - PSIG
0
200
400
600
800
1000
1200
1400
1600

EXHIBIT "C"

WELLS SUSPECTED OF BEING INADEQUATELY PLUGGED AND ABANDONED OR INADEQUATELY CASED AND CEMENTED

OPERATOR	LEASE	WELL NO.	UNIT	SEC-TWP-RGE
Mobil	State P	7	P	22-17S-35E
Penrose	State	2	N	24-17S-35E
Phillips	Santa Fe	15	A	28-17S-35E
Phillips	Santa Fe	16	L	5-18S-35E
Phillips	Santa Fe	37	F	28-17S-35E
Phillips	Santa Fe	47	C	35-17S-35E
Shell	State U	1	C	3-18S-35E
Shell	State VAA	6	K	5-18S-35E
Shell	State C	1	I	24-17S-34E
Shell	State I	1	E	29-17S-35E
Shell	State S	1	I	21-17S-35E
Stoltz etal.	Abo	1	O	24-17S-35E
Zapata	Shell State	1	O	23-17S-35E
Barnett	State B	1	D	19-17S-35E
Jones	State	2	A	35-17S-35E
Penrose	Scarborough	1	C	25-17S-35E
Amoco	State CV	1	F	25-17S-35E
Amoco	State CV	4	L	25-17S-35E
Amoco	State CV	5	F	25-17S-35E
Chevron	State 6-34	4	J	34-17S-35E
Cities Service	State BJ	2	K	35-17S-35E
Crusader	State	1	E	20-17S-35E
Crusader	State	2	C	19-17S-35E
Crusader	State	3	N	18-17S-35E
Exxon	State J	1	M	19-17S-35E
Exxon	State J	2	L	19-17S-35E
Exxon	State AC	1	H	22-17S-35E
Great Western	State E	2	L	25-17S-35E
Marathon	Warn State	1	M	23-17S-35E
Amoco	State CV	2	E	25-17S-35E
Amoco	State CV	2-Y	E	25-17S-35E
Millard Deck	Carthay State	2	G	20-17S-35E
Exxon	State K	17	P	32-17S-35E
Marathon	Staplin State	1	L	20-17S-35E
Marathon	Warn State	1	B	4-18S-35E
Mobil	N.Vac.AboUnit	207	H	24-17S-34E
Pennzoil	Phillips State	1	A	28-17S-35E
Pennzoil	Phillips State	2	F	28-17S-35E
Phillips	Vac.AboUnit	6-68	H	34-17S-35E
Phillips	Vac.Abo Unit	1-9	J	27-17S-35E
Phillips	Vac.Abo Unit	7-3	P	27-17S-35E
Phillips	Vac.Abo Unit	7-4	I	27-17S-35E
Phillips	Vac.Abo Unit	9-5	H	33-17S-35E
Phillips	Vac.Abo Unit	13-2	E	4-18S-35E

OPERATOR	LEASE	WELL NO.	UNIT	SEC-TWP-RGE
Phillips	Vac.Abo Unit	14-3	N	5-18S-35E
Phillips	Vac.Abo Unit	14-4	L	5-18S-35E
Shell	State V	6	P	27-17S-35E
Shell	State K	1	O	19-17S-35E

EXHIBIT "C"
ORDER NO. R-5897

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. 7426
Order No. R-6856

APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR AMENDMENT OF DIVISION ORDER NO. R-5897 AND APPROVAL OF A QUALIFIED TERTIARY OIL RECOVERY PROJECT UNDER THE CRUDE OIL WINDFALL PROFITS TAX ACT OF 1980, LEA COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 9:00 a.m. on November 19, 1981, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 16th day of December, 1981, 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, Phillips Petroleum Company, seeks the Amendment of Division Order No. R-5897, to include the injection of carbon dioxide in its previously authorized pressure maintenance project in the East Vacuum Grayburg-San Andres Unit, for conversion of existing injectors to water/carbon dioxide injection, and for the approval of a portion of the East Vacuum Grayburg-San Andres Unit as a Qualified Tertiary Oil Recovery Project under the Crude Oil Windfall Profits Tax Act of 1980.

(3) That said pressure maintenance project lies within the Vacuum Grayburg-San Andres Pool, Lea County, New Mexico.

(4) That said pool was discovered May 5, 1924, by Socony Vacuum Oil Company, experienced substantial development thereafter with waterflooding being initiated in a project during 1958.

(5) That the Phillips Petroleum Company East Vacuum Unit Pressure Maintenance Project consisting of approximately 7025 acres was approved by said Division Order No. R-5897 on January 16, 1979, and water injection was commenced within said project during December, 1979.

(6) That the applicant now seeks approval for the injection of carbon dioxide and water into 45 project wells and the designation of a qualifying tertiary recovery project area within said pressure maintenance project.

(7) That the proposed Qualifying Tertiary Project Area (QTP Area) lies wholly within said East Vacuum Unit Pressure Maintenance Project and consists of the following described acreage:

TOWNSHIP 17 SOUTH, RANGE 35 EAST, NMPM	
Section 26:	W/2; NE/4; W/2 SE/4; and NE/4 SE/4
Section 27:	All
Section 28:	All
Section 29:	All
Section 31:	N/2 SE/4 and SE/4 SE/4
Section 32:	All
Section 33:	All
Section 34:	N/2; SW/4; and NW/4 SE/4
Section 35:	N/2 NW/4

TOWNSHIP 18 SOUTH, RANGE 35 EAST, NMPM	
Section 4:	N/2 NW/4 and NW/4 NE/4
Section 5:	N/2 and NW/4 SW/4

containing 4997 acres more or less.

(8) That the QTP Area is adequately delineated and that the entire area will be affected.

(9) That the New Mexico Oil Conservation Division has been designated by the Governor of the State of New Mexico as the appropriate agency to approve Qualified Tertiary Recovery Projects in New Mexico for purposes of the Crude Oil Windfall Profits Tax Act of 1980.

(10) That the tertiary oil recovery method used in the Phillips QTP Area is a carbon dioxide miscible displacement method which is a recognized tertiary oil recovery method described in Section 212.78(c) of the Department of Energy Regulations in effect in June, 1979.

(11) That the Tertiary Recovery method includes overinjection of voidage with water at maximum rates to achieve a miscibility pressure in the formation.

(12) That slim-tube tests have determined such miscibility pressure to be approximately 1369 psia.

(13) That overinjection began on February 1, 1981, and carbon dioxide injection will begin after miscibility pressure has been achieved.

(14) That under the tertiary recovery method to be used, it is anticipated that the volume of injected carbon dioxide measured at reservoir temperature and pressure will be more than 10 percent of the reservoir pore volume being served by the injection wells.

(15) That because of the geological and reservoir characteristics of the effected reservoir, the QTP Area is well suited for miscible fluid displacement by carbon dioxide as an enhanced recovery process.

(16) That the estimated primary production from the East Vacuum Unit Pressure Maintenance Project Area is 72 million barrels and that water flooding secondary recovery operations will recover an additional 38 million barrels.

(17) That an estimated 26 million barrels of additional oil (which is 10 percent of the original oil in place within the project area) will be recovered as a result of the tertiary recovery operations, which is more than an insignificant increase in the amount of crude oil which will ultimately be recovered.

(18) That the QTP Area tertiary recovery operations beginning date is after May, 1979.

(19) That the QTP Area tertiary recovery operations beginning date (i.e., the date on which the injection of liquids, gases or other matter begins) was February 1, 1981.

(20) That the proposed tertiary recovery operations within said QTP Area meet all requirements of Section 4993 of the Internal Revenue Code.

(21) That the Phillips QTP Area project is designated in accordance with sound engineering principles.

(22) That the approval of this application will prevent waste, protect correlative rights and promote conservation.

IT IS THEREFORE ORDERED:

(1) That effective December 1, 1981, the Qualifying Tertiary Recovery Project Area, described in Finding No. (7) of this Order, of the Phillips Petroleum Company East Vacuum Unit Pressure Maintenance Project, Vacuum Grayburg-San Andres Pool, Lea County, New Mexico, is hereby approved as a Qualified Tertiary Recovery Project under the Crude Oil Windfall Profits Tax Act of 1980.

(2) That the applicant, Phillips Petroleum Company, is hereby authorized to inject water and carbon dioxide into the 45 wells listed on Exhibit "A" attached to this Order.

(3) That Order No. R-5897 is hereby amended to authorize injection of carbon dioxide up to an average maximum bottom hole pressure of 3150 psi.

(4) That 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

JOE D. RAMEY,
Director

S E A L

CASE NO. 7426
Order No. R-6856

EXHIBIT A

Approved Water-Alternate-
Carbon Dioxide Injectors

Tract 2622 - Well 004
Well 006

Tract 2717 - Well 003
Well 005
Well 007

Tract 2720 - Well 006

Tract 2721 - Well 001
Well 002

Tract 2738 - Well 007
Well 008
Well 009

Tract 2801 - Well 005
Well 006
Well 007
Well 012
Well 015

Tract 2865 - Well 001

Tract 2913 - Well 007
Well 008
Well 009

Tract 2941 - Well 001

Tract 2947 - Well 001

Tract 2963 - Well 004

Tract 2980 - Well 003

Tract 3127 - Well 004

Tract 3202 - Well 008
Well 009
Well 010
Well 013

Tract 3229 - Well 006
Well 008

Tract 3236 - Well 006

Tract 3315 - Well 006
Well 008

Tract 3328 - Well 003

Tract 3332 - Well 001

Tract 3333 - Well 005
Well 006

Tract 3373 - Well 001

Tract 3374 - Well 002

Tract 3456 - Well 006
Well 007
Well 009

Tract 0524 - Well 001
Well 006

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. 7426 (REOPENED)
Order No. R-6856-A

APPLICATION OF PHILLIPS PETROLEUM COMPANY FOR AMENDMENT OF DIVISION ORDER NO. R-5897 AND CERTIFICATION OF A TERTIARY RECOVERY PROJECT, LEA COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on August 22, 1990, at Santa Fe, New Mexico, before Examiner David R. Catanach.

NOW, on this 19th day of September, 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) By Order No. R-5897, dated January 16, 1979, issued in Case No. 6367, the Division authorized Phillips Petroleum Corporation to institute a pressure maintenance project by the injection of water into the San Andres formation, Vacuum Grayburg-San Andres Pool, through certain wells on its East Vacuum Grayburg San Andres Unit, Lea County, New Mexico.

(3) By Order No. R-6856, dated December 16, 1981, issued in Case No. 7426, the Division amended Order No. R-5897 by authorizing Phillips Petroleum Corporation to inject water and carbon dioxide into the San Andres formation, Vacuum Grayburg-San Andres Pool, through certain wells on said East Vacuum Grayburg San Andres Unit.

(4) The applicant, Phillips Petroleum Corporation, seeks the further amendment of Order No. R-5897, as amended, to retroactively authorize injection of hydrocarbon gas into the Vacuum Grayburg-San Andres Pool through approved injection wells within the unit.

(5) Injection of carbon dioxide gas commenced within the East Vacuum Grayburg San Andres Unit during September, 1985.

(6) As a result of carbon dioxide gas injection into the reservoir, a portion of the hydrocarbon gas produced within the unit has contained, since approximately 1986, varying amounts of carbon dioxide.

(7) The produced gas from the East Vacuum Grayburg San Andres Unit is processed and marketed through the Phillips Petroleum Corporation Lea Gas Processing Plant, which, according to evidence and testimony, will not accept for processing gas containing 15 percent or greater carbon dioxide.

(8) In November, 1986, the applicant began reinjecting that portion of the unit's produced gas which contained approximately 15 percent or greater carbon dioxide.

(9) To date, approximately 3.2 BCF of hydrocarbon/carbon dioxide gas has been reinjected into the subject reservoir.

(10) According to evidence and testimony, the applicant is currently evaluating the economic viability of constructing a recovery plant whereby the associated liquids contained within the hydrocarbon/carbon dioxide gas stream may be recovered and marketed.

(11) The applicant's further testimony indicates that construction of facilities to separate the methane gas from the hydrocarbon/carbon dioxide gas stream is not economically viable at the present time.

(12) Injection of the hydrocarbon/carbon dioxide gas stream will not reduce the effectiveness of the project and will not reduce ultimate oil recovery from the subject reservoir.

(13) The applicant's current method of disposition of the hydrocarbon/carbon dioxide gas is in the best interest of conservation, protection of correlative rights, and prevention of waste.

(14) The application should be approved by amending Division Order No. R-5897, as amended by Order No. R-6856.

IT IS THEREFORE ORDERED THAT:

(1) Ordering Paragraph No. (2) of Division Order No. R-6856 is hereby amended to read in its entirety as follows:

"(2) That the applicant, Phillips Petroleum Company, is hereby authorized to inject water, carbon dioxide, and hydrocarbon/carbon dioxide gas stream into the 45 wells listed on Exhibit "A" attached to this order."

(2) 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

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. 10779
Order No.R-6856-B

APPLICATION OF PHILLIPS PETROLEUM COMPANY TO QUALIFY FIVE PORTIONS OF ITS EAST VACUUM GRAYBURG-SAN ANDRES UNIT PRESSURE MAINTENANCE PROJECT FOR THE RECOVERED OIL TAX RATE PURSUANT TO THE "NEW MEXICO ENHANCED OIL RECOVERY ACT," LEA COUNTY, NEW MEXICO

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 A.M. on July 29, 1993, at Santa Fe, New Mexico, before Examiner Michael E. Stogner.

NOW, on this 12thday of November, 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) The following orders of the Division have been issued for the Phillips Petroleum Company East Vacuum Grayburg-San Andres Pressure Maintenance Project:

(a) Order No. R-5871, issued in Case No. 6366 and dated November 27, 1978, approved the application of Phillips Petroleum Company for statutory unitization of the following described 7,025.3 acres, more or less, of State lands in Lea County, New Mexico, also known as the East Vacuum Grayburg-San Andres Unit Area:

TOWNSHIP 17 SOUTH, RANGE 34 EAST, NMPM
Section 24: SE/4

TOWNSHIP 17 SOUTH, RANGE 35 EAST, NMPM

Section 18: Lots 3 and 4 (W/2 SW/4 equivalent) and SE/4 SW/4
Section 19: Lots 1 through 4 (W/2 W/2 equivalent), S/2 NE/4, E/2 W/2, and SE/4
Section 20: SW/4 NE/4, W/2 NW/4, SE/4 NW/4, SW/4, W/2 SE/4, and SE/4 SE/4
Section 21: NE/4 SW/4, S/2 SW/4, and SE/4
Section 22: SW/4, W/2 SE/4, and SE/4 SE/4
Section 23: S/2 SW/4
Section 24: SW/4 SW/4
Section 25: W/2 NW/4
Section 26: N/2, SW/4, N/2 SE/4, and SW/4 SE/4
Sections 27 through 29: All
Section 31: N/2 SE/4 and SE/4 SE/4
Sections 32 and 33: All
Section 34: N/2, SW/4, and NW/4 SE/4
Section 35: N/2 NW/4

TOWNSHIP 18 SOUTH, RANGE 35 EAST, NMPM

Section 4: Lots 2, 3, and 4 (NW/4 NE/4 and N/2 NW/4 equivalent)
Section 5: Lots 1 through 4 and S/2 S/2 (N/2 equivalent) and NW/4 SW/4

(b) Order No. R-5897, issued in Case No. 6367 and dated January 26, 1979, authorized Phillips Petroleum Company to institute a pressure maintenance project (therein designated the East Vacuum Grayburg-San Andres Unit Pressure Maintenance Project Area) by the injection of water into the Vacuum Grayburg-San Andres Pool on the above-described Unit, Lea County, New Mexico.

(c) Order No. R-6856, issued in Case 7426 and dated December 16, 1981, amended Order No. R-5897 by authorizing Phillips Petroleum Company to inject carbon dioxide along with water through 45 certain wells within the following described area therein designated a "Qualified Tertiary Project Area" that lies wholly within the East Vacuum Grayburg-San Andres Unit Pressure Maintenance Project Area:

TOWNSHIP 17 SOUTH, RANGE 35 EAST, NMPM
Section 26: N/2, SW/4, N/2 SE/4, and SW/4 SE/4
Sections 27 through 29: All
Section 31: N/2 SE/4 and SE/4 SE/4
Sections 32 and 33: All
Section 34: N/2, SW/4, and NW/4 SE/4
Section 35: N/2 NW/4

TOWNSHIP 18 SOUTH, RANGE 35 EAST, NMPM
Section 4: Lots 2, 3, and 4 (NW/4 NE/4 and N/2 NW/4 equivalent)
Section 5: Lots 1 through 4 and S/2 S/2 (N/2 equivalent) and NW/4 SW/4

(d) Order No. R-6856-A, issued in Reopened Case 7426, on September 19, 1990, provided for the reinjection of hydrocarbon contaminated carbon dioxide into said Qualified Tertiary Project Area.

(3) At this time the applicant, Phillips Petroleum Company, seeks an order pursuant to the Rules and Procedures for Qualification of Enhanced Oil Recovery Projects and Certification for the Recovered Oil Tax Rate, as promulgated by Division Order No. R-9708, qualifying five portions of its East Vacuum Grayburg-San Andres Unit Pressure Maintenance Project, Vacuum Grayburg-San Andres Pool, Lea County, New Mexico, for the recovered oil tax rate pursuant to the "Enhanced Oil Recovery Act" (Laws 1992, Chapter 38, Sections 1 through 5).

(4) The proposed five areas under consideration specifically comprise the following described lands:

Area 1:

That portion of Lot No. 3 being the SW/4 NW/4 NE/4 NW/4 equivalent, the W/2 SW/4 NE/4 NW/4 equivalent, and the SE/4 SW/4 NE/4 NW/4 equivalent, that portion of Lot No. 4 being the S/2 N/2 NW/4 NW/4 equivalent, and the S/2 NW/4 NW/4 equivalent, N/2 SW/4 NW/4, N/2 S/2 SW/4 NW/4, NW/4 SE/4 NW/4, and N/2 SW/4 SE/4 NW/4 all in Section 5, Township 18 South, Range 35 East, NMPM, Lea County, New Mexico, comprising 85 acres, more or less.

Area 2:

S/2 N/2 NE/4 SW/4, S/2 NE/4 SW/4, SE/4 NE/4 NW/4 SW/4, E/2 SE/4 NW/4 SW/4, E/2 NE/4 SW/4 SW/4, NE/4 SE/4 SW/4 SW/4, N/2 SE/4 SW/4, N/2 S/2 SE/4 SW/4, SW/4 NE/4 NE/4 SE/4, S/2 NW/4 NE/4 SE/4, SW/4 NE/4 SE/4, W/2 SE/4 NE/4 SE/4, S/2 N/2 NW/4 SE/4, S/2 NW/4 SE/4, N/2 SW/4 SE/4, N/2 S/2 SW/4 SE/4, W/2 NE/4 SE/4 SE/4, NW/4 SE/4 SE/4, N/2 SW/4 SE/4 SE/4, and NW/4 SE/4 SE/4 SE/4 all in Section 32, Township 17 South, Range 35 East, NMPM, Lea County, New Mexico, comprising 180.00 acres, more or less.

Area 3:

S/2 SW/4 NE/4 NE/4, S/2 NE/4 NW/4 NE/4, W/2 NW/4 NE/4, SE/4 NW/4 NE/4, N/2 SW/4 NE/4, SW/4 SW/4 NE/4, N/2 SE/4 SW/4 NE/4, N/2 NW/4 SE/4 NE/4, NE/4 NE/4 NW/4, S/2 NW/4 NE/4 NW/4, S/2 NE/4 NW/4, S/2 SE/4 NW/4 NW/4, NE/4 SW/4 NW/4, S/2 NW/4 SW/4 NW/4, S/2 SW/4 NW/4, SE/4 NW/4, N/2 NE/4 SW/4, SW/4 NE/4 SW/4, N/2 SE/4 NE/4 SW/4, E/2 NW/4 SW/4, N/2 NW/4 NW/4 SW/4, SE/4 NW/4 NW/4 SW/4, NE/4 SW/4 NW/4 SW/4, N/2 NE/4 SW/4 SW/4, N/2 NW/4 SE/4 SW/4, and N/2 NW/4 NW/4 SE/4 all in Section 33, Township 17 South, Range 35 East, NMPM, Lea County, New Mexico, comprising 275.00 acres, more or less.

Area 4:

S/2 SW/4 NE/4 NE/4, S/2 SE/4 NW/4 NE/4, NE/4 SW/4 NE/4, S/2 NW/4 SW/4 NE/4, S/2 SW/4 NE/4, S/2 NE/4 SE/4 NE/4, W/2 SE/4 NE/4, SE/4 SE/4 NE/4, S/2 SE/4 SE/4 NW/4, E/2 NE/4 NE/4 SW/4, NE/4 SE/4, N/2 NW/4 SE/4, E/2 SW/4 NW/4 SE/4, SE/4 NW/4 SE/4, E/2 NE/4 SW/4 SE/4, and N/2 SE/4 SE/4 of Section 33 and S/2 SW/4 SW/4 NW/4, W/2 SW/4 NE/4 SW/4, S/2 NE/4 NW/4 SW/4, W/2 NW/4 SW/4, SE/4 NW/4 SW/4, N/2 NE/4 SW/4 SW/4, and NW/4 SW/4 SW/4 of Section 34, all in Township 17 South, Range 35 East, NMPM, Lea County, New Mexico, comprising 250.00 acres, more or less.

Area 5:

S/2 SW/4 NE/4 NE/4, NW/4 NE/4, N/2 SW/4 NE/4, N/2 S/2 SW/4 NE/4, N/2 NW/4 SE/4 NE/4, NE/4 NW/4, S/2 SE/4 NW/4 NW/4, N/2 NE/4 SW/4 NW/4, N/2 SE/4 NW/4, and N/2 S/2 SE/4 NW/4 all in Section 32, Township 17 South, Range 35 East, NMPM, Lea County, New Mexico, comprising 160 acres, more or less.

(5) All of the above-described areas are located wholly within the "Qualified Tertiary Project Area" approved by said Order No. R-6856, as amended.

(6) Evidence indicates Phillips proceeded with its carbon dioxide/water injection phase within said "Qualified Tertiary Project Area" in 1985. According to Division records there are currently forty-two active and three inactive carbon dioxide/water injection wells within the boundary of said "Qualified Tertiary Project Area". Said flood operations have thus far been conducted on 80-acre inverted nine-spot patterns.

(7) Primary oil recovery from the entire pressure maintenance project has been approximately 78,000,000 barrels of oil. As of January 1993, total oil production from said Unit was approximately 117,099,100 barrels of oil. Under the current 80-acre invert nine-spot patterns, ultimate secondary and tertiary oil recovery is estimated to be 66,548,800 barrels of oil.

(8) Said pressure maintenance project is currently producing at a rate of 7,900 BOPD and 38,000 BWPD from 199 active producers with 100 currently active injection wells (both water and carbon dioxide/water injectors). Approximately 26,000,000 barrels of recoverable oil reserves remain under the current mode of operations.

(9) Phillips seeks to expand portions of this "Qualified Tertiary Project Area" by means of a significant change in the process used for the displacement of crude oil which will be a modification of well configurations in the five above-described selected areas of the Unit. This proposed expansion will require that the applicant drill and equip a total of eight new producing wells, convert four existing producing wells to injection, reactivate one producing well, and upgrade existing tank batteries and injection facilities as follows:

AREA 1: There is presently no injection activity in this particular area, carbon dioxide/water injection will commence by converting the East Vacuum G/SA Unit, Tract 0524, Well No. 129 and the drilling of an infill producing well (East Vacuum G/SA Unit, Tract 0524, Well No. 7) in the

SW/4 SE/4 NW/4 (the SW/4 of Unit F). The entire area including the following five existing wells; East Vacuum G/SA Unit, Tract 0524, Well Nos. 2, 3, 8, 45, and 112; should be affected by this change which will change, somewhat, the process used for displacement of crude oil by the introduction of carbon dioxide into this virgin area;

AREA 2: Three additional infill producing wells are to be drilled (East Vacuum G/SA Unit, Tract 3202, Well Nos. 20 and 21 and the East Vacuum G/SA Unit, Tract 3229, Well No. 13) within the area and the existing East Vacuum G/SA Unit, Tract 3202, Well No. 1, in Unit I, will be converted to a carbon dioxide/water injection well. There is currently one carbon dioxide/water injection well within the area, the East Vacuum G/SA Unit, Tract 3229, Well No. 8. The impact of these changes should affect the areal sweep as to allow carbon dioxide to contact areas that are currently not being contacted with carbon dioxide from the existing injection well located in the area. As a consequence, the following seven producing wells should experience an improvement in oil recovery through this improved sweep efficiency; East Vacuum G/SA Unit, Tract 3202, Well Nos. 4, 6, 12, and 15 and the East Vacuum G/SA Unit, Tract 3229, Well Nos. 3, 4, and 5;

AREA 3: There are currently two carbon dioxide/water injectors in this area, the East Vacuum G/SA Unit, Tract 3333, Well No. 5 and the East Vacuum G/SA Unit, Tract 3374, Well No. 2. This area is being converted from two 80-acre nine-spot patterns to a 160-acre line drive pattern. The existing East Vacuum G/SA Unit, Tract 3333, Well No. 2 will be converted to injection and three additional producing wells (the East Vacuum G/SA Unit, Tract 3308, Well No. 6, East Vacuum G/SA Unit, Tract 3366, Well No. 1, and East Vacuum G/SA Unit, Tract 3373, Well No. 2) will be drilled offset to the line drive injection. The combination of these changes will alter the displacement process significantly by increasing the areal sweep to allow carbon dioxide to contact new areas that are currently not being contacted with carbon dioxide. In addition to the three new infill wells, the following nine existing producers should experience an improvement in oil recovery through improved sweep efficiency; the East Vacuum G/SA Unit, Tract 3308, Well Nos. 2 and 3, the East Vacuum G/SA Unit, Tract 3366, Well No. 29, the East Vacuum G/SA Unit, Tract 3373, Well No. 28, the East Vacuum G/SA Unit, Tract 3333, Well Nos. 3 and 8, the East Vacuum G/SA Unit, Tract 3328, Well No. 2, and the East Vacuum G/SA Unit, Tract 3374, Well Nos. 1 and 3;

AREA 4: There are currently two carbon dioxide/water injectors in this area, the East Vacuum G/SA Unit, Tract 3315, Well Nos. 6 and 8. This area is being converted from one 80-acre nine-spot pattern and one 70-acre seven spot pattern to a 150-acre line drive pattern. The existing East Vacuum G/SA Unit, Tract 3315, Well No. 1 will be converted to injection and an additional well (the East Vacuum G/SA Unit, Tract 3440, Well No. 7) is to be drilled to accomplish these changes in operations. The combination of these changes should alter the oil displacement process significantly by changing the areal sweep to allow carbon dioxide to contact new areas that are currently not being contacted with carbon dioxide. In addition, the following nine wells should experience an improvement in oil recovery through this improved sweep efficiency; the East Vacuum G/SA Unit, Tract 3333, Well Nos. 1, 4, and 7, the East Vacuum G/SA Unit, Tract 3440, Well Nos. 1, 3, and 5, and the East Vacuum G/SA Unit, Tract 3315, Well Nos. 2, 4, and 5; and,

AREA 5: The conversion of the East Vacuum G/SA Unit, Tract 3202, Well No. 33, along with the existing carbon dioxide/water injector East Vacuum G/SA Unit, Tract 3236, Well No. 6, will alter this pattern from an 80-acre inverted nine-spot pattern to an 80-acre line drive pattern. This change will alter the oil displacement process by changing the areal sweep to allow carbon dioxide to contact new areas that are currently not being contacted with carbon dioxide. The following seven wells should experience an improvement in oil recovery through this improved sweep efficiency; the East Vacuum G/SA Unit, Tract 3202, Well Nos. 3, 16, and 19 and the East Vacuum G/SA Unit, Tract 3236, Well Nos. 3, 4, 5, and 7.

(10) Applicant's engineering evidence indicates that with a significant change or modification in the injection patterns with the drilling of said additional producers and the conversion of existing wells to injection, an estimated additional 1.056 million barrels of oil will be recovered in the five "Expanded Use Areas" having a current undiscounted value of $19,505,308.00.

(11) The costs of the required additional facilities in the five "Expanded Use Areas" are estimated to be approximately $3,958,825.00 and the total project costs are estimated to be approximately $5,976,249.00.

(12) The geologic evidence presented by Phillips demonstrated that portions of the reservoir in the "Expanded Use Areas" contains distinct stringers each vertically isolated from the others with none continuous over the entire southern portion of the unit resulting in the existing 80-acre waterflood pattern being too large to overcome the areal discontinuities found in the Pool.

(13) Based on the testimony presented in this case the proposed enhanced oil recovery project is economically and technically feasible and has not been prematurely filed.

(14) Each of the subject five "Expanded Use Areas" that are included in the "Qualified Tertiary Project Area" of Phillips' East Vacuum Grayburg-San Andres Unit Pressure Maintenance Project Area should be qualified an "Enhanced Oil Recovery Project" (EOR) pursuant to the "Enhanced Oil Recovery Act" (Laws 1992, Chapter 38, Sections 1 through 5).

(15) In order for the applicant to be eligible for said EOR credit, the operator should advise the Division, after an appropriate application for injection is processed, when the injection into each additional injection well commences and at such time, request the Division certify the project to the New Mexico Taxation and Revenue Department.

(16) The application should be approved and the EOR Project should be governed by the provisions of the "Rules and Procedures for Qualifications of Enhanced Oil Recovery Projects" and "Certification for Recovered Oil Tax Rate" as promulgated by Division Order No. R-9708.

(17) Each of the five "enhanced oil recovery project areas" should initially comprise those producing wells listed by Phillips that are to be affected by the expanded carbon dioxide/water injection in the five subject areas.

(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 identify 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.

IT IS THEREFORE ORDERED THAT:

(1) The application of Phillips Petroleum Company to qualify five individual and separate portions of its East Vacuum Grayburg-San Andres Unit Pressure Maintenance Project, Vacuum Grayburg-San Andres Pool, Lea County, New Mexico as an "Enhanced Oil Recovery Project" pursuant to the "Enhanced Oil Recovery Act" (Laws 1992, Chapter 38, Sections 1 through 5), is hereby approved.

(2) The subject "enhanced oil recovery project areas" shall initially comprise the following five described areas in Lea County, New Mexico:

Area 1:

That portion of Lot No. 3 being the SW/4 NW/4 NE/4 NW/4 equivalent, the W/2 SW/4 NE/4 NW/4 equivalent, and the SE/4 SW/4 NE/4 NW/4 equivalent, that portion of Lot No. 4 being the S/2 N/2 NW/4 NW/4 equivalent, and the S/2 NW/4 NW/4 equivalent, N/2 SW/4 NW/4, N/2 S/2 SW/4 NW/4, NW/4 SE/4 NW/4, and N/2 SW/4 SE/4 NW/4 all in Section 5, Township 18 South, Range 35 East, NMPM, Lea County, New Mexico, comprising 85 acres, more or less.

Area 2:

S/2 N/2 NE/4 SW/4, S/2 NE/4 SW/4, SE/4 NE/4 NW/4 SW/4, E/2 SE/4 NW/4 SW/4, E/2 NE/4 SW/4 SW/4, NE/4 SE/4 SW/4 SW/4, N/2 SE/4 SW/4, N/2 S/2 SE/4 SW/4, SW/4 NE/4 NE/4 SE/4, S/2 NW/4 NE/4 SE/4, SW/4 NE/4 SE/4, W/2 SE/4 NE/4 SE/4, S/2 N/2 NW/4 SE/4, S/2 NW/4 SE/4, N/2 SW/4 SE/4, N/2 S/2 SW/4 SE/4, W/2 NE/4 SE/4 SE/4, NW/4 SE/4 SE/4, N/2 SW/4 SE/4 SE/4, and NW/4 SE/4 SE/4 SE/4 all in Section 32, Township 17 South, Range 35 East, NMPM, Lea County, New Mexico, comprising 180.00 acres, more or less.

Area 3:

S/2 SW/4 NE/4 NE/4, S/2 NE/4 NW/4 NE/4, W/2 NW/4 NE/4, SE/4 NW/4 NE/4, N/2 SW/4 NE/4, SW/4 SW/4 NE/4, N/2 SE/4 SW/4 NE/4, N/2 NW/4 SE/4 NE/4, NE/4 NE/4 NW/4, S/2 NW/4 NE/4 NW/4, S/2 NE/4 NW/4, S/2 SE/4 NW/4 NW/4, NE/4 SW/4 NW/4, S/2 NW/4 SW/4 NW/4, S/2 SW/4 NW/4, SE/4 NW/4, N/2 NE/4 SW/4, SW/4 NE/4 SW/4, N/2 SE/4 NE/4 SW/4, E/2 NW/4 SW/4, N/2 NW/4

NW/4 SW/4, SE/4 NW/4 NW/4 SW/4, NE/4 SW/4 NW/4 SW/4,, N/2 NE/4 SW/4 SW/4, N/2 NW/4 SE/4 SW/4, and N/2 NW/4 NW/4 SE/4 all in Section 33, Township 17 South, Range 35 East, NMPM, Lea County, New Mexico, comprising 275.00 acres, more or less.

Area 4:

S/2 SW/4 NE/4 NE/4, S/2 SE/4 NW/4 NE/4, NE/4 SW/4 NE/4, S/2 NW/4 SW/4 NE/4, S/2 SW/4 NE/4, S/2 NE/4 SE/4 NE/4, W/2 SE/4 NE/4, SE/4 SE/4 NE/4, S/2 SE/4 SE/4 NW/4, E/2 NE/4 NE/4 SW/4, NE/4 SE/4, N/2 NW/4 SE/4, E/2 SW/4 NW/4 SE/4, SE/4 NW/4 SE/4, E/2 NE/4 SW/4 SE/4, and N/2 SE/4 SE/4 of Section 33 and S/2 SW/4 SW/4 NW/4, W/2 SW/4 NE/4 SW/4, S/2 NE/4 NW/4 SW/4, W/2 NW/4 SW/4, SE/4 NW/4 SW/4, N/2 NE/4 SW/4 SW/4, and NW/4 SW/4 SW/4 of Section 34, all in Township 17 South, Range 35 East, NMPM, Lea County, New Mexico, comprising 250.00 acres, more or less.

Area 5:

S/2 SW/4 NE/4 NE/4, NW/4 NE/4, N/2 SW/4 NE/4, N/2 S/2 SW/4 NE/4, N/2 NW/4 SE/4 NE/4, NE/4 NW/4, S/2 SE/4 NW/4 NW/4, N/2 NE/4 SW/4 NW/4, N/2 SE/4 NW/4, and N/2 S/2 SE/4 NW/4 all in Section 32, Township 17 South, Range 35 East, NMPM, Lea County, New Mexico, comprising 160 acres, more or less.

(3) Each of the five Project Areas shall be defined in terms of the unit wells which would actually qualify for the recovered oil tax rate and shall initially comprise the following wells in the above described areas in Lea County, New Mexico:

AREA 1: EAST VACUUM GRAYBURG-SAN ANDRES UNIT		AREA 2: EAST VACUUM GRAYBURG-SAN ANDRES UNIT	
Tract No.	Well No.	Tract No.	Well No.
INJECTION WELLS		INJECTION WELLS	
0524	129	3202	1
PRODUCING WELLS		3229	8
0524	2	PRODUCING WELLS	

AREA 1: EAST VACUUM GRAYBURG-SAN ANDRES UNIT		AREA 2: EAST VACUUM GRAYBURG-SAN ANDRES UNIT	
Tract No.	Well No.	Tract No.	Well No.
0524	3	3202	4
0524	7	3202	6
0524	8	3202	12
0524	45	3202	15
0524	112	3202	20
		3202	21
		3229	3
		3229	4
		3229	5
		3229	13

AREA 3: EAST VACUUM GRAYBURG-SAN ANDRES UNIT		AREA 4: EAST VACUUM GRAYBURG-SAN ANDRES UNIT	
Tract No.	Well No.	Tract No.	Well No.
INJECTION WELLS		INJECTION WELLS	
3333	2	3315	1
3333	5	3315	6
3374	2	3315	8
PRODUCING WELLS		PRODUCING WELLS	
3308	2	3333	1
3308	3	3333	4
3308	6	3333	7
3328	2	3315	2
3333	3	3315	4

AREA 3: EAST VACUUM GRAYBURG-SAN ANDRES UNIT		AREA 4: EAST VACUUM GRAYBURG-SAN ANDRES UNIT	
Tract No.	Well No.	Tract No.	Well No.
3333	8	3315	5
3366	1	3440	1
3366	29	3440	3
3373	2	3440	5
3373	28	3440	7
3374	1		
3374	3		

AREA 5: EAST VACUUM GRAYBURG-SAN ANDRES UNIT	
Tract No.	Well No.
INJECTION WELLS	
3202	3
3236	6
PRODUCING WELLS	
3202	3
3202	16
3202	19
3236	3
3236	4
3236	5
3236	7

(4) The operator shall advise the Division when the additional injection phase of the project commences into any of the new injection wells.

(5) 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 identify 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.

(6) Said EOR project shall be governed by the provisions of the "Rules and Procedures for Qualifications of Enhanced Oil Recovery Projects" and "Certification for Recovered Oil Tax Rate" as promulgated by Division Order No. R-9708.

(7) 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

SEAL

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 5970
Order No. R-5496

APPLICATION OF TEXACO INC. FOR
STATUTORY UNITIZATION AND PRESSURE
MAINTENANCE, VACUUM-GRAYBURG-SAN ANDRES
POOL, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on June 22, 1977, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 9th day of August, 1977, the Commission, a quorum being present, 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 Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Texaco Inc., seeks the statutory unitization, pursuant to the "Statutory Unitization Act," Sections 65-14-1 through 65-14-21, NMSA, 1953 Compilation, of 3,046.2 acres, more or less, of State and fee lands, being a portion of the Vacuum-Grayburg-San Andres Pool, Lea County, New Mexico, and approval of the plan of unitization and the proposed operating plan.

(3) That the proposed unit area would be designated the Central Vacuum Unit Area; that the vertical limits of said unit area would be the subsurface formation commonly known as the Grayburg-San Andres formation identified between the depths of 3,858 feet (plus 144 feet sub-sea) and 4,858 feet (minus 856 feet sub-sea) on the Welex Acoustic Velocity Log, run on November 15, 1963, in Texaco's State of New Mexico "O" (NCT-1)

Well No. 23, located in the SW/4 SE/4 of Section 36, Township 17 South, Range 34 East, NMPM, Lea County, New Mexico, and is to include all subsurface points throughout the Unit area correlative to those identified depths, and that the unit area would comprise the following described lands:

TOWNSHIP 17 SOUTH, RANGE 34 EAST, NMPM
Section 25: S/2 and SE/4 NE/4
Section 36: All

TOWNSHIP 17 SOUTH, RANGE 35 EAST, NMPM
Section 30: All
Section 31: N/2, SW/4, and SW/4 SE/4

TOWNSHIP 18 SOUTH, RANGE 34 EAST, NMPM
Section 12: N/2 NE/4

TOWNSHIP 18 SOUTH, RANGE 35 EAST, NMPM
Section 6: All
Section 7: NW/4 and NW/4 NE/4

(4) That the portion of the Vacuum-Grayburg-San Andres Pool proposed to be included in the aforesaid Central Vacuum Unit Area has been reasonably defined by development.

(5) That the applicant proposes to institute a pressure maintenance project for the secondary recovery of oil and gas in the proposed unit area.

(6) That the unitized management, operation and further development of the subject portion of the Vacuum-Grayburg-San Andres Pool, as proposed, is reasonably necessary in order to effectively carry on secondary recovery operations and to substantially increase the ultimate recovery of oil from the pool.

(7) That the proposed unitized method of operation as applied to the Central Vacuum Unit Area is feasible, will prevent waste, and will result with reasonable probability in the increased recovery of substantially more oil from the pool than would otherwise be recovered.

(8) That the estimated additional costs of such operations will not exceed the estimated value of the additional oil so recovered plus a reasonable profit.

(9) That such unitization and adoption of the proposed unitized method of operation will benefit the working interest owners and royalty owners of the oil and gas rights within the Central Vacuum Unit Area.

(10) That the applicant has made a good faith effort to secure voluntary unitization within the Vacuum Grayburg-San Andres Pool.

(11) That the participation formula contained in the unitization agreement allocates the produced and saved unitized hydrocarbons to the separately owned tracts in the unit area on a fair, reasonable and equitable basis, and protects the correlative rights of all owners of interest within the unit area.

(12) That applicant's Exhibits Nos. 8 and 9 in this case, being the Unit Agreement and the Unit Operating Agreement should be incorporated by reference into this order.

(13) That the Statutory Unitization of the Central Vacuum Unit Area, in conformance to the above findings, will prevent waste and protect correlative rights and should be approved.

IT IS THEREFORE ORDERED:

(1) That the Central Vacuum Unit Agreement, covering 3,046.2 acres, more or less, of State and fee lands in the Vacuum-Grayburg-San Andres Pool, Lea County, New Mexico, is hereby approved for statutory unitization pursuant to the Statutory Unitization Act, Sections 65-14-1 through 65-14-21, NMSA, 1953 Compilation.

(2) That the lands covered by said Central Vacuum Unit Agreement shall be designated the Central Vacuum Unit Area and shall comprise:

TOWNSHIP 17 SOUTH, RANGE 34 EAST, NMPM
Section 25: S/2 and SE/4 NE/4
Section 36: All

TOWNSHIP 17 SOUTH, RANGE 35 EAST, NMPM
Section 30: All
Section 31: N/2, SW/4, and SW/4 SE/4

TOWNSHIP 18 SOUTH, RANGE 34 EAST, NMPM
Section 12: N/2 NE/4

TOWNSHIP 18 SOUTH, RANGE 35 EAST, NMPM
Section 6: All
Section 7: NW/4 and NW/4 NE/4

(3) That the vertical limits of the Central Vacuum Unit Area shall be the Grayburg-San Andres formation identified between the depths of 3,858 feet (plus 144 feet sub-sea) and 4,858 feet (minus 856 feet sub-sea) on the Welex Acoustic Velocity Log, run on November 15, 1963, in Texaco's State of New Mexico "O" (NCT-1) Well No. 23, located in the SW/4 SE/4 of Section 36, Township 17 South, Range 34 East, NMPM, Lea County, New Mexico, and is to include all subsurface points throughout the Unit area correlative to those identified depths.

(4) That applicant's Exhibit No. 8 in this case, being the Central Vacuum Unit Agreement, is hereby incorporated by reference into this order.

(5) That applicant's Exhibit No. 9 in this case, being the Central Vacuum Unit Operating Agreement, is hereby incorporated by reference into this order.

(6) That the Central Vacuum Unit Agreement and the Central Vacuum Unit Operating Agreement provide for unitization and unit operation of the subject portion of the Vacuum-Grayburg-San Andres Pool upon terms and conditions that are fair, reasonable and equitable and include:

an allocation to the separately owned tracts in the unit area of all the oil and gas that is produced from the unit area and is saved, being the production that is not used in the conduct of operations on the unit area or not unavoidably lost;

a provision for the credits and charges to be made in the adjustment among the owners in the unit area for their respective investments in wells, tanks, pumps, machinery, materials and equipment contributed to the unit operations;

a provision governing how the costs of unit operations including capital investments shall be determined and charged to the separately owned tracts and how said costs shall be paid including a provision providing when, how, and by whom the unit production allocated to an owner who does not pay the share of the costs of unit operations charged to such owner, or the interest of such owner, may be sold and the proceeds applied to the payment of such costs;

a provision for carrying any working interest owner on a limited, carried or net-profits basis, payable out of production, upon such terms and conditions determined by the Commission to be just and reasonable, and allowing an appropriate charge for interest for such service payable out of such owner's share of production, provided that any nonconsenting working interest owner being so carried shall be deemed to have relinquished to the unit operator all of its operating rights and working interest in and to the unit until his share of the costs, service charge and interest are repaid to the unit operator;

a provision designating the unit operator and providing for the supervision and conduct of the unit operations, including the selection, removal or substitution of an operator from among the working interest owners to conduct the unit operations;

a provision for a voting procedure for the decision of matters to be decided by the working interest owners in respect to which each working interest owner shall have a voting interest equal to its unit participation; and

the time when the unit operation shall commence and the manner in which, and the circumstances under which, the operations shall terminate and for the settlement of accounts upon such termination;

and are therefore hereby adopted.

(7) That this order shall not become effective unless and until the appropriate ratification provisions of Section 65-14-8, NMSA, 1953 Compilation, are complied with.

(8) That if the persons owning the required percentage of interest in the unit area as set out in Section 65-14-8 NMSA, 1953 Compilation, do not approve the plan for unit operations within a period of six months from the date of entry of this order, this order shall cease to be of further force and effect and shall be revoked by the Commission, unless the Commission shall extend the time for ratification for good cause shown.

(9) That when the persons owning the required percentage of interest in the unit area have approved the plan for unit operations, the interests of all persons in the unit are unitized whether or not such persons have approved the plan of unitization in writing.

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

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

PHIL R. LUCERO, Chairman

EMERY C. ARNOLD, Member

JOE D. RAMEY, Member & Secretary

S E A L

dr/

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 6008
Order No. R-5530

APPLICATION OF TEXACO INC., FOR
A PRESSURE MAINTENANCE PROJECT,
LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on August 17, 1977, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 20th day of September, 1977, the Commission, a quorum being present, 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 Commission has jurisdiction of this cause and the subject matter thereof.

(2) That by Commission Order No. R-5496 dated August 9, 1977, statutory unitization was approved for the Central Vacuum Unit Area, Lea County, New Mexico.

(3) That the applicant herein, Texaco Inc., seeks authority to institute a pressure maintenance project on the aforesaid Central Vacuum Unit Area, Vacuum Grayburg-San Andres Pool, Lea County, New Mexico, by the injection of water into the San Andres formation through the 55 wells described on Exhibit A attached to this order.

(4) That to permit an efficient injection pattern, the unorthodox locations of the 54 new injection wells as reflected on said Exhibit A should be approved.

(5) That the applicant further seeks the designation of a project area and the promulgation of special rules and regulations governing said project including special allowable provisions.

(6) That the project area should consist of those proration units within the boundary of said Central Vacuum Unit upon which is located an injection well and any directly or diagonally offsetting proration unit which contains a producing well.

(7) That the total project area allowable should be equal to the sum of the basic project area allowable plus the water injection credit allowable, and said total project area allowable should be limited to 80 barrels of oil per day times the number of developed 40-acre proration units in the project area times two.

(8) That the basic project area allowable should be equal to 80 barrels of oil per day times the number of developed 40-acre proration units in the project area.

(9) That the water injection credit allowable should be based on the following formula:

$$\text{Water Injection Credit Allowable} = \left[\frac{\text{net water injected}}{\text{basic project area allowable voidage}}\right] \times \text{basic project area allowable}$$

and should be calculated as follows:

$$\text{Water Injection Credit Allowable} = \left\{ \frac{W_i - W_p}{BPAA\left[\beta_o + \left(\frac{R_p - R_s}{1000}\right)\beta_g\right]} - 1 \right\} BPAA$$

where W_i = Average daily water injection during previous month, project area

W_p = Average daily water production during previous month, project area

BPAA = Basic Project Area Allowable = 80 x number of 40-acre tracts in project area

β_o = Oil formation volume factor, reservoir barrels per stock tank barrel, as determined from Exhibit B, for latest available project area reservoir pressure

R_p = Producing gas-oil ratio, cubic feet per barrel, during previous month, project area

R_s = Solution gas-oil ratio, cubic feet per barrel, as determined from Exhibit B, for latest available project area reservoir pressure

β_g = Gas formation volume factor, reservoir barrels per MCF, as determined from Exhibit B, for latest available project area reservoir pressure

In no event should the Water Injection Credit Allowable be less than zero.

(10) That the project area allowable should be produced from the wells within the project area in any proportion provided that any proration unit situated on the boundary of said Central Vacuum Unit which proration unit is not directly or diagonally offset by a San Andres injection well outside the unit should not be permitted to produce in excess of 80 barrels of oil per day.

(11) That each of the newly drilled injection wells in the project should be equipped with surface casing and production casing set at approximately 350 feet and 4800 feet, respectively, and cemented to the surface.

(12) That injection should be accomplished through 2 3/8-inch plastic coated tubing installed in a packer which should be set approximately 50 feet above the uppermost perforation in the case of newly drilled wells and at approximately 4376 feet in the one well to be converted to injection.

(13) That the casing-tubing annulus in each injection well should be filled with an inert fluid and that a pressure gauge or approved leak detection device should be attached to the annulus in order to determine leakage in the casing, tubing, or packer.

(14) That the injection wells or system should be equipped with a pop-off valve or acceptable substitute which will limit the surface injection pressure to no more than 0.2 pounds per foot of depth to the uppermost perforation unless the Secretary-Director of the Commission should administratively authorize a higher pressure.

(15) That there are 15 wells, as set out on Exhibit C to this order, which are located within or immediately adjacent to the boundaries of said Central Vacuum Unit which are completed or plugged in such a manner that will not assure that they will not serve as channels for injected water to migrate from the San Andres formation to other formations or to the surface.

(16) That to prevent migration of injected water from the San Andres formation, formation injection pressure at wells offsetting the wells identified on said Exhibit C should be limited to hydrostatic pressure until such time as the wells on said Exhibit C have been repaired or it shall otherwise be demonstrated to the satisfaction of the Secretary-Director of the Commission that the same will not serve as avenues for escape of such waters.

(17) That the wells within the project should be equipped to facilitate periodic testing of the annular space between strings of production and surface casing.

(18) That the operator should take all other 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, producing, or plugged and abandoned wells.

(19) That approval of the subject application should result in the recovery of additional volumes of oil from the Central Vacuum Unit Area, thereby preventing waste.

(20) That the application should be approved.

IT IS THEREFORE ORDERED:

(1) That the applicant, Texaco Inc., is hereby authorized to institute a pressure maintenance project in the Central Vacuum Unit Area, Vacuum-Grayburg-San Andres Pool, Lea County, New Mexico, by the injection of water into 55 wells at orthodox and unorthodox locations as set out on Exhibit A attached to this order and by reference made a part hereof.

(2) That each of the newly drilled injection wells shall be equipped with surface casing and production casing set at approximately 350 feet and 4800 feet, respectively, and cemented to the surface.

(3) That injection shall be accomplished through 2 3/8-inch plastic coated tubing installed in a packer set approximately 50 feet above the uppermost perforation in the case of newly drilled wells and at approximately 4376 feet in the one existing well converted to injection.

(4) That the casing-tubing annulus in each injection well shall be filled with an inert fluid and a pressure gauge or approved leak detection device shall be attached to the annulus in order to determine leakage in the casing, tubing, or packer.

(5) That the injection wells or system shall be equipped with a pop-off valve or acceptable substitute which will limit the surface injection pressure to no more than 0.2 pounds per foot of depth to the uppermost perforations.

(6) That the Secretary-Director of the Commission may administratively authorize a pressure limitation in excess of that set out in Order No. (5) above upon a showing by the operator that such higher pressure will not result in fracturing of the confining strata.

(7) That the applicant shall not inject water into the formation of any well located on a 40-acre tract that has on it, or that directly or diagonally offsets a tract that has on it, one of the 15 wells identified on Exhibit C attached hereto and by reference made a part hereof, at a pressure greater than hydrostatic until such well has been repaired or it has been shown to the satisfaction of the Secretary-Director of the Commission that such well will not serve as an avenue of escape for waters injected into the San Andres formation and he has authorized a higher than hydrostatic pressure.

(8) That the wells within the project area shall be equipped with risers or in another acceptable manner such as to facilitate the periodic testing of the bradenhead for pressure or fluid production.

(9) That the operator shall immediately notify the supervisor of the Commission district office at Hobbs of the failure of the tubing or packer in any of said injection wells, the leakage of water or oil from or around any producing well, the leakage of water or oil from or around any plugged and abandoned well within the project area, or any other evidence of fluid migration from the injection zone, and shall take such timely steps as may be necessary or required to correct such failure or leakage.

(10) That the pressure maintenance project shall be designated the Texaco Inc. Central Vacuum Unit Pressure Maintenance Project.

(11) That the project area of said Central Vacuum Unit Pressure Maintenance Project shall consist of those proration units within the boundary of the Central Vacuum Unit upon which is located an injection well and any directly or diagonally offsetting proration unit which contains a producing well.

(12) That those wells within the Central Vacuum Unit Area that are not included within the project area as defined above shall be prorated in accordance with the Rules and Regulations of the Commission.

(13) That the project area shall receive a project area allowable, and said project area allowable shall be the sum of the basic project area allowable plus the water injection credit allowable, and shall be limited to 80 barrels of oil per day times the number of developed 40-acre project area times two.

(14) That the basic project area allowable shall be equal to 80 barrels of oil per day times the number of developed 40-acre proration units in the project area.

(15) That the water injection credit allowable shall be based on the following formula:

$$\text{Water Injection Credit Allowable} = \left[\frac{\text{net water injected}}{\text{basic project area allowable voidage}}\right] \times \text{basic project area allowable}$$

and should be calculated as follows:

$$\text{Water Injection Credit Allowable} = \left\{\frac{W_i - W_p}{BPAA\left[\beta_o + \left(\frac{R_p - R_s}{1000}\right)\beta_g\right]} - 1\right\} BPAA$$

where:
- W_i = Average daily water injection during previous month, barrels per day, project area only
- W_p = Average daily water produced during previous month, barrels per day, project area only
- BPAA = Basic Project Area Allowable = 80 x number of 40-acre tracts in project area
- β_o = Oil formation volume factor, reservoir barrels per stock tank barrel, as determined from Exhibit B (attached hereto and by reference made a part hereof), for the latest available project area reservoir pressure
- R_p = Producing gas-oil ratio, cubic feet per barrel, for previous month, project area only
- R_s = Solution gas-oil ratio, cubic feet per barrel, as determined from Exhibit B, for the latest available project area reservoir pressure
- β_g = Gas formation volume factor, reservoir barrels per MCF, as determined from Exhibit B, for latest available project area reservoir pressure

In no event shall the Water Injection Credit Allowable be less than zero, i.e., negative numbers derived from application of the above formula shall be ignored.

(13) That the average project area reservoir pressure shall be determined prior to the commencement of injection of water into the reservoir and at least annually thereafter. The average project area pressure shall be the average of the pressures in at least ten representative wells selected by the operator of the unit and the Supervisor of the Hobbs District Office of the Commission at an agreed upon datum.

(14) That the project area allowable may be produced from any well within the project area in any proportion provided, however, that any proration unit situated on the boundary of the Central Vacuum Unit which proration unit is not directly or diagonally offset by a San Andres injection well outside said Central Vacuum Unit shall not be permitted to produce in excess of 80 barrels of oil per day.

(15) That each month the project operator shall submit to the Commission a Pressure Maintenance Project Operator's Report, on a form prescribed by the Commission, outlining thereon the data required, and requesting allowables for each of the several wells in the Project as well as the total project area allowable. The aforesaid Pressure Maintenance Project Operator's Report shall be filed in lieu of Form C-120 for the Project.

(16) That the Commission shall, upon review of the report and after any adjustments deemed necessary, calculate the allowable for the wells in the Project for the next succeeding month in accordance with these rules. The sum of the allowables so calculated shall be assigned to the Project and, except as provided under Order (14) above, may be produced from the wells in the Project in any proportion.

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

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

PHIL R. LUCERO, Chairman

EMERY C. ARNOLD, Member

JOE D. RAMEY, Member & Secretary

S E A L

dr/

CENTRAL VACUUM UNIT
Authorized Injection Wells

54 new wells to be drilled at the following locations:

WELL NO.	LOCATION	SECTION	TOWNSHIP SOUTH	RANGE EAST
5	1310' FNL & 1310' FWL	30	17	35
6	1310' FNL & 2630' FWL	30	17	35
7	1310' FNL & 1330' FEL	30	17	35
13	2630' FNL & 10' FEL	25	17	34
14	2630' FNL & 1310' FWL	30	17	35
15	2630' FNL & 2630' FWL	30	17	35
16	2630' FNL & 1330' FEL	30	17	35
25	1330' FSL & 1310' FWL	25	17	34
26	1330' FSL & 2630' FWL	25	17	34
27	1330' FSL & 1330' FEL	25	17	34
28	1330' FSL & 10' FEL	25	17	34
29	1330' FSL & 1310' FWL	30	17	35
30	1330' FSL & 2630' FWL	30	17	35
31	1330' FSL & 1330' FEL	30	17	35
40	10' FSL & 1310' FWL	25	17	34
41	10' FSL & 2630' FWL	25	17	34
42	10' FSL & 1330' FEL	25	17	34
43	10' FSL & 10' FEL	25	17	34
44	10' FSL & 1310' FWL	30	17	35
45	10' FSL & 2630' FWL	30	17	35
46	10' FSL & 1330' FEL	30	17	35
55	1310' FNL & 1310' FWL	36	17	34
56	1310' FNL & 2630' FWL	36	17	34
57	1310' FNL & 1330' FEL	36	17	34
58	1310' FNL & 10' FEL	36	17	34
59	1310' FNL & 1310' FWL	31	17	35
60	1310' FNL & 2630' FWL	31	17	35
61	1310' FNL & 1330' FEL	31	17	35
70	2630' FNL & 1310' FWL	36	17	34
71	2630' FNL & 2630' FWL	36	17	34
72	2630' FNL & 1330' FEL	36	17	34
73	2630' FNL & 10' FEL	36	17	34
74	2630' FNL & 1310' FWL	31	17	35
81	1330' FSL & 1310' FWL	36	17	34
82	1330' FSL & 2630' FWL	36	17	34
83	1330' FSL & 1330' FEL	36	17	34
84	1330' FSL & 10' FEL	36	17	34
85	1330' FSL & 1310' FWL	31	17	35
93	10' FSL & 1310' FWL	31	17	35
94	10' FSL & 2630' FWL	31	17	35
99	1310' FNL & 1310' FWL	6	18	35
100	1310' FNL & 2630' FWL	6	18	35
101	1310' FNL & 1330' FEL	6	18	35
106	2520' FNL & 1040' FWL	6	18	35

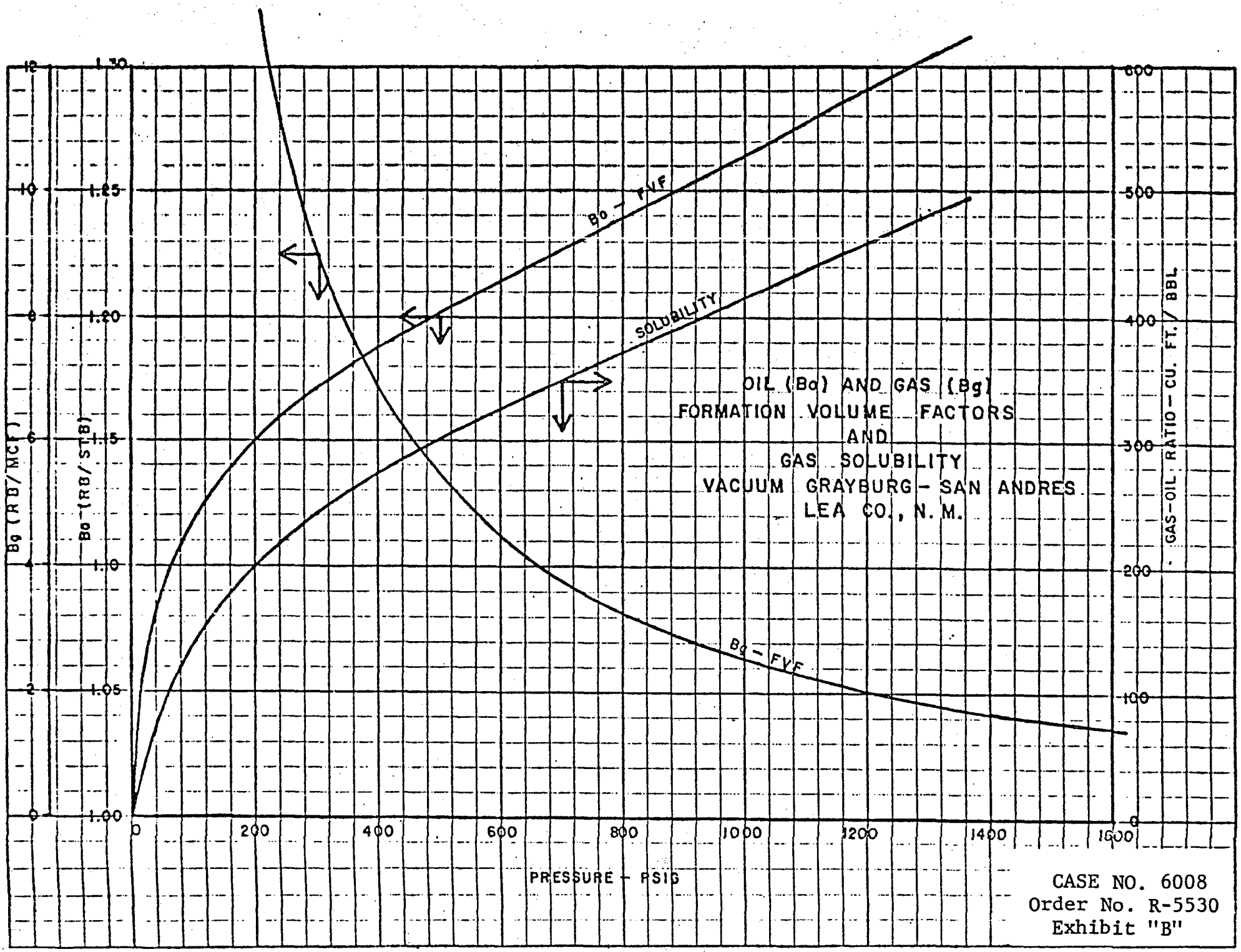
Case No. 6008
Order No. R-5530
Exhibit "A"

54 new wells to be drilled at the following locations continued

WELL NO.	LOCATION	SECTION	TOWNSHIP SOUTH	RANGE EAST
107	2450' FNL & 2630' FWL	6	18	35
108	2630' FNL & 1480' FEL	6	18	35
113	1620' FSL & 1100' FWL	6	18	35
114	1460' FSL & 2100' FWL	6	18	35
115	1600' FSL & 1500' FEL	6	18	35
120	60' FNL & 1100' FWL	7	18	35
121	400' FSL & 2380' FWL	6	18	35
122	350' FSL & 1560' FEL	6	18	35
128	1310' FNL & 200' FEL	12	18	34
129	1310' FNL & 2630' FWL	7	18	35

One existing well, Sun Oil Company Lea State "B" No. 7 located as follows:

131	2119' FNL & 918' FWL	7	18	35


Bo - FVF
SOLUBILITY
Bg - FVF
OIL (Bo) AND GAS (Bg)
FORMATION VOLUME FACTORS
AND
GAS SOLUBILITY
VACUUM GRAYBURG - SAN ANDRES
LEA CO., N. M.
Bg (RB/MCF)
Bo (RB/STB)
GAS-OIL RATIO - CU. FT./ BBL
PRESSURE - PSIG
0
200
400
600
800
1000
1200
1400
1600
1.00
1.05
1.10
1.15
1.20
1.25
1.30
0
2
4
6
8
10
12
0
100
200
300
400
500
600
CASE NO. 6008
Order No. R-5530
Exhibit "B"

OPERATOR	LEASE	WELL NO.	UT.	SEC.	TWP.	RGE.
Continental Oil Co.	State H 35	9	H	35	17S	34E
Getty Oil Company	State AN	8	P	7	18S	35E
Getty Oil Company	State AN	9	I	7	18S	35E
Getty Oil Company	State BA	6	D	36	17S	34E
Marathon Oil Co.	Warn State A/c 2	6	K	6	18S	35E
Marathon Oil Co.	Warn State A/c 2	10	K	6	18S	35E
Mobil Oil Corp.	Bridges State	11	F	25	17S	34E
Mobil Oil Corp.	State DD	1	D	31	17S	35E
Phillips Petroleum Co.	Santa Fe	87	L	31	17S	35E
Texaco Inc.	New Mexico "AB" State	5	J	6	18S	35E
Texaco Inc.	New Mexico "AE" State	4	F	12	18S	34E
Texaco Inc.	New Mexico "O" State NCT-1	14	J	36	17S	34E
Texaco Inc.	New Mexico "O" State NCT-1	18	H	36	17S	34E
Texaco Inc.	New Mexico "P" State	1	J	7	18S	35E
Texaco Inc.	New Mexico "Q" State	4	P	25	17S	34E

Case No. 6008
Order No. R-5530
Exhibit "C"

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. 11650
ORDER NO. R-5530-E

APPLICATION OF TEXACO EXPLORATION AND PRODUCTION INC. FOR AMENDMENT OF DIVISION ORDER NO. R-5530, AS AMENDED, TO INCREASE INJECTION PRESSURES IN ITS CENTRAL VACUUM UNIT PRESSURE MAINTENANCE PROJECT AREA, AUTHORIZE A TERTIARY RECOVERY PROJECT BY THE INJECTION OF CARBON DIOXIDE AND TO QUALIFY THIS PROJECT FOR THE RECOVERED OIL TAX RATE PURSUANT TO THE "ENHANCED OIL RECOVERY ACT", LEA COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a. m. on December 19, 1996, at Santa Fe, New Mexico, before Examiner David R. Catanach.

NOW, on this 30th day of April, 1997, 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) By Division Order R-5496, entered in Case No. 5970 on August 9, 1977, the Division, upon application of Texaco Inc., approved the Central Vacuum Unit, said unit comprising some 3,046 acres, more or less, of State and fee lands described as follows:

TOWNSHIP 17 SOUTH, RANGE 34 EAST, NMPM
Section 25: S/2, SE/4 NE/4
Section 36: All

TOWNSHIP 17 SOUTH, RANGE 35 EAST, NMPM
Section 30: All
Section 31: N/2, SW/4, SW/4 SE/4

TOWNSHIP 18 SOUTH, RANGE 34 EAST, NMPM
Section 12: N/2 NE/4

TOWNSHIP 18 SOUTH, RANGE 35 EAST, NMPM
Section 6: All
Section 7: NW/4, NW/4 NE/4

(3) By Order No. R-5530 entered in Case No. 6008 on September 20, 1977, the Division authorized Texaco Inc. to institute a pressure maintenance project within the aforesaid Central Vacuum Unit by the injection of water into the Grayburg and San Andres formations, Vacuum Grayburg-San Andres Pool, through fifty-five initial injection wells.

(4) The "Unitized Formation" for the Central Vacuum Unit includes the stratigraphic interval underlying the Unit Area in the Vacuum-Grayburg-San Andres Pool between the depths of 3,858 feet (plus 144 feet sub-sea) and 4,858 feet (minus 856 feet sub-sea) on the Welex Acoustic Velocity Log, run on November 15, 1963, in the Texaco Inc. State of New Mexico "O" (NCT-1) Well No. 23, located in Unit O of Section 36, Township 17 South, Range 34 East, NMPM, Lea County, New Mexico (now Vacuum Glorieta West Unit Well No. 101).

(5) The applicant, Texaco Exploration and Production Inc. (Texaco) seeks:

a) to amend Division Order No. R-5530, as amended, to authorize the implementation of tertiary recovery operations within the Central Vacuum Unit Pressure Maintenance Project by the alternate injection of water and carbon dioxide and produced gases (WAG) into the Grayburg and San Andres formations;

b) authorization to increase the surface injection pressure for water in certain injection wells to 1500 psi, provided that step rate tests conducted on these wells do not indicate fracturing of the injection formation;

c) authorization to inject carbon dioxide gas at a maximum surface injection pressure of 350 psi above the maximum allowed surface water injection pressure, not to exceed 1850 psi; and,

d) to qualify the proposed tertiary recovery project for the recovered oil tax rate pursuant to the "New Mexico Enhanced Oil Recovery Act" (Laws 1992, Chapter 38, Sections 1 through 5).

(6) The applicant proposed that the project area for the tertiary recovery project comprise some 1,550 acres, more or less, being a portion of the Central Vacuum Unit Area, described as follows:

TOWNSHIP 17 SOUTH, RANGE 34 EAST, NMPM
Section 25: S/2 S/2 SE/4, S/2 SE/4 SW/4, SE/4 SW/4 SW/4
Section 36: S/2, NE/4, E/2 NW/4, SW/4 NW/4, S/2 NW/4 NW/4, NE/4 NW/4 NW/4

TOWNSHIP 17 SOUTH, RANGE 35 EAST, NMPM
Section 30: S/2 S/2 SW/4, S/2 SW/4 SE/4, SW/4 SE/4 SE/4
Section 31: W/2, SW/4 SE/4, W/2 NE/4, SE/4 NE/4, S/2 NE/4 NE/4, NW/4 NE/4 NE/4

TOWNSHIP 18 SOUTH, RANGE 35 EAST, NMPM
Section 6: N/2 NW/4, NW/4 NE/4, SW/4 NW/4, N/2 NE/4 NE/4, SW/4 NE/4 NE/4, NW/4 SE/4 NE/4, N/2 SW/4 NE/4, N/2 SE/4 NW/4, SW/4 SE/4 NW/4, N/2 NW/4 SW/4, NW/4 NE/4 SW/4

(7) Current secondary recovery operations within the Central Vacuum Unit are summarized as follows:

Number of Producing Wells:	88
Number of Injection Wells:	86
Current Oil Production:	4,100 BOPD
Current Water Injection:	63,000 BWPD
Cumulative Oil Recovery:	72 MMSTBO
Cumulative Secondary Oil Recovery (1977-Date):	42 MMSTBO
Current Average Water Cut:	96%

(8) According to evidence and testimony presented by the applicant, its plan of operation within the proposed tertiary recovery project includes:

a) implementing a change in the process used for the displacement of crude oil by initiating water-alternating-gas (WAG) injection (injecting water and carbon dioxide (CO_2) in alternating slugs of produced gas and CO_2 with slugs of water);

b) injecting an estimated 259 BCF of CO_2 and other produced gases and 148 million barrels of water over the life of the proposed tertiary project, which is estimated to be approximately 25 years;

c) utilizing a total of fifty-one (51) injection wells (all as shown on Exhibit "A" attached hereto) and seventy-one (71) producing wells (sixty-eight (68) existing wells and three (3) new wells proposed to be drilled) within the proposed tertiary recovery project; and,

d) injecting at sufficient pressure so as to maintain reservoir pressure at high enough levels to meet miscible pressure requirements in the reservoir.

(9) The proposed tertiary recovery project area (described in Finding No. 6 above) represents approximately 50 percent of the area contained within the Central Vacuum Unit. According to applicant's testimony, the proposed tertiary recovery project is being limited to only a portion of the Central Vacuum Unit for the following reasons:

a) the targeted area represents that portion of the Central Vacuum Unit which contains the best hydrocarbon pore volume within the Grayburg-San Andres reservoir; and,

b) the current economics of the proposed tertiary recovery project dictate that CO_2 injection should be initially limited to that portion of the Central Vacuum Unit containing sufficient hydrocarbon pore volume.

(10) Applicant further testified that the proposed tertiary recovery project may be expanded in the future into other areas of the Central Vacuum Unit in the event economic considerations become more favorable.

(11) Further evidence and testimony presented by the applicant indicates that the amount of recoverable oil attributed to a positive production response from the expanded use of enhanced oil recovery technology for the proposed tertiary recovery project is an estimated 20.3 million stock tank barrels along with 23.2 BCF of hydrocarbon gas.

(12) Texaco testified that the initiation of tertiary recovery operations utilizing the methodology proposed should result in the additional recovery set forth in Finding Paragraph No. (11) above for a projected cost of approximately $345.7 million which includes field installations and upgrades, well remediation, separation and compression facilities, the purchase of CO_2 and the costs associated with the recycling of injectant.

(13) The proposed tertiary recovery project is offset by the following described tertiary CO_2 floods within the Vacuum Grayburg-San Andres Pool, approved respectively, by Division Order Nos. R-6856, as amended, and Order No. R-10599-B:

a) to the east is the Phillips Petroleum Company East Vacuum Grayburg-San Andres Unit Pressure Maintenance Project located in portions of Townships 17 and 18 South, Range 35 East, NMPM, East Vacuum Grayburg-San Andres Unit Area, Lea County, New Mexico. The current authorized bottomhole pressure in this project area equates to a surface injection pressure for CO_2 of approximately 1850 psig; and,

b) to the west is the Phillips Petroleum Company State "35" Unit Pressure Maintenance Project which is also a CO_2 tertiary recovery project underlying the N/2, E/2 SW/4, and SE/4 of Section 35, Township 17 South, Range 34 East, NMPM, State "35" Com Unit Area, Lea County, New Mexico. The authorized surface injection pressure for CO_2 in this project area is 1850 psig.

(14) The evidence and testimony presented in this case indicates that it is prudent to implement the proposed tertiary recovery project within the Central Vacuum Unit at this time, and that such implementation will result in the recovery of additional oil and gas from the project area which may otherwise not be recovered, thereby preventing waste.

(15) The evidence further indicates that the oil and gas recovered as a result of implementing the proposed tertiary recovery project will be allocated to each tract within the Central Vacuum Unit on a fair and reasonable basis, thereby protecting correlative rights.

(16) The proposed tertiary recovery project should be approved.

(17) The evidence presented by Texaco indicates that the proposed tertiary recovery project meets all the criteria for certification 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).

(18) The certified "EOR Project Area" should initially comprise the area described in Finding Paragraph No. (6) above, provided however, the "EOR Project Area" eligible for the recovered oil tax rate may be contracted and reduced dependent upon the evidence presented by the applicant in its demonstration of the occurrence of a positive production response.

(19) To be eligible for the EOR tax credit, the applicant should advise the Division when CO_2 (WAG) injection commences within the "EOR Project Area" and request the Division certify the subject tertiary recovery project to the New Mexico Taxation and Revenue Department.

(20) At such time as a positive production response occurs from CO_2 (WAG) injection operations and within seven 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 benefiting from tertiary recovery operations. The Division may review the application administratively or set it for hearing. Based upon evidence presented, the Division will certify to the New Mexico Taxation and Revenue Department those lands and wells which are eligible for the tax credit.

(21) Division Order No. R-5530 established maximum surface injection pressures within the Central Vacuum Unit equal to 0.2 psi/ft. of depth to the uppermost injection perforation in each of the fifty-five initial injection wells, or approximately 800 psi.

(22) Throughout the course of secondary recovery operations, the maximum surface injection pressures for the injection wells within the Central Vacuum Unit have been increased upon a showing by the operator that such higher pressure will not result in the fracturing of the injection formation or confining strata. Pressure increases such as described are usually based upon the results of step rate tests.

(23) The current maximum surface injection pressures within the proposed tertiary recovery project area range from approximately 872 psi to 2775 psi.

(24) With regards to the injection pressures within the proposed tertiary recovery project area, the applicant seeks:

a) authority to inject CO_2 at a surface injection pressure 350 psi above the current maximum surface injection pressure for water for a given well (all as shown on applicant's Exhibit No. 12), said CO_2 injection pressure not to exceed 1850 psi;

b) authority to continue to conduct step rate tests and receive pressure increase authority on injection wells within the tertiary recovery project area whose current maximum surface injection pressure for water is less than 1500 psi; and,

c) authority to increase the surface injection pressure for water to 1500 psi on eight wells located within the tertiary recovery project area which have shown no "break" or fracture on current step rate tests, (these wells having been identified on applicant's Exhibit No. 12).

(25) The evidence and testimony presented by Texaco indicates that the proposed maximum CO_2 surface injection pressure of 1850 psi, or 350 psi above the current maximum surface injection pressure for water, is reasonable, necessary and should not result in the migration of injected fluid from the proposed injection interval.

(26) Texaco should be authorized to conduct step rate tests and obtain surface injection pressure increases for water within those injection wells in the tertiary recovery project area whose current maximum surface injection pressure for water is less than 1500 psi.

(27) Texaco should be required to submit current step rate tests on those eight wells described in Finding No. (24)(c) above prior to obtaining Division approval to increase the surface injection pressure for water on these wells to 1500 psi.

(28) All injection wells or the pressurization system should be initially equipped with a pressure control device or acceptable substitute which will limit the surface injection pressure to no more than the individual well surface injection pressure authorized by this order.

(29) The applicant testified that there are no "problem wells" within the one-half mile "area of review" and further testified that all plugged and abandoned wells and all producing wells are cemented in a manner adequate to confine the injected fluid to the proposed injection interval.

(30) Texaco proposed that each of the injection wells shown on Exhibit "A" be equipped no different than previously equipped for waterflood operation.

(31) In support of this request, Texaco testified that it anticipates no additional corrosion problems within these wellbores as a result of CO_2 injection.

(32) Texaco's request should be granted, provided however, the Division may require the installation of additional or upgraded wellbore tubulars and packers should it become apparent that the injection of CO_2 is causing beyond normal corrosion problems.

(33) If not previously equipped, each of the injection wells shown on Exhibit "A" should be equipped with internally coated tubing installed in a packer set within 100 feet of the uppermost injection perforation or casing shoe; 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.

(34) 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 any new injection equipment and of the mechanical integrity pressure tests in order that the same may be witnessed.

(35) 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, Texaco Exploration and Production Inc., is hereby authorized to institute an EOR tertiary recovery project by means of combined water, carbon dioxide (CO_2), and produced gas injection (WAG) in its Central Vacuum Unit Area located in portions of Townships 17 and 18 South, Ranges 34 and 35 East, NMPM, Lea County, New Mexico, by the injection of water, CO_2, and produced gases into the Grayburg and San Andres formations, Vacuum-Grayburg-San Andres Pool, through the correlative gross perforated and/or open hole interval between the depths of 3,858 feet (plus 144 feet sub-sea) and 4,858 feet (minus 856 feet sub-sea) on the Welex Acoustic Velocity Log, run on November 15, 1963, in the Texaco Inc. State of New Mexico "O" (NCT-1) Well No. 23, located in Unit O of Section 36, Township 17 South, Range 34 East, NMPM, Lea County, New Mexico (now Vacuum Glorieta West Unit Well No. 101), within each of the fifty-one injection wells shown on Exhibit "A" attached hereto.

IT IS FURTHER ORDERED THAT:

(2) Any previous injection authority not in conflict with the provisions set forth in this order shall remain in full force and effect.

(3) WAG injection operations shall be accomplished through internally coated tubing installed in a packer set within approximately 100 feet of the uppermost injection perforations or casing shoe; the casing-tubing annulus shall be filled with an inert fluid and a gauge or approved leak-detection device shall be attached to the annulus in order to determine leakage in the casing, tubing or packer.

(4) For those injection wells within the "EOR Project Area" whose current maximum surface injection pressure for water is less than 1500 psi (as shown on applicant's Exhibit No. 12), the applicant is hereby authorized to inject water into each of these wells at the current maximum surface injection pressure, provided however, such pressure may be administratively increased by the Division upon a showing that such increase will not result in the fracturing of the injection formation or confining strata, and shall be further authorized to inject CO_2 and produced gases at a maximum surface injection pressure of 350 psi above the current maximum surface injection pressure for water, provided however, such CO_2 injection shall not occur at a surface injection pressure in excess of 1850 psi.

(5) For those injection wells within the "EOR Project Area" whose current maximum surface injection pressure for water exceeds 1500 psi (as shown on applicant's Exhibit No. 12), the applicant is hereby authorized to inject water into each of these wells at the current maximum surface injection pressure, and shall be further authorized to inject CO_2 and produced gases at a maximum surface injection pressure of 1850 psi.

(6) Texaco shall be required to submit current step rate tests on those eight wells described in Finding No. (24)(c) above prior to obtaining Division approval to increase the surface injection pressure for water on these wells to 1500 psi.

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

(8) The operator shall immediately notify the Supervisor of the Hobbs District Office of the Division of the failure of the casing in any of the injection wells, the leakage of water, natural gas, CO_2, or oil from or around any producing well, or the leakage of water, natural gas, CO_2, or oil from any plugged and abandoned well within the "EOR Project Area", and shall take such steps as may be necessary to correct such failure or leakage.

(9) The subject tertiary recovery project is hereby certified as a qualified "Enhanced Oil Recovery Project" pursuant to the"Enhanced Oil Recovery Act" (Laws 1992, Chapter 38, Sections 1 through 5).

(10) The certified and approved "EOR Project Area" shall include those lands described as follows, provided however, the "EOR Project Area" eligible for the recovered oil tax rate may be reduced dependent upon the evidence presented by the applicant in its demonstration of the occurrence of a positive production response.

TOWNSHIP 17 SOUTH, RANGE 34 EAST, NMPM
Section 25: S/2 S/2 SE/4, S/2 SE/4 SW/4, SE/4 SW/4 SW/4
Section 36: S/2, NE/4, E/2 NW/4, SW/4 NW/4, S/2 NW/4 NW/4, NE/4 NW/4 NW/4

TOWNSHIP 17 SOUTH, RANGE 35 EAST, NMPM
Section 30: S/2 S/2 SW/4, S/2 SW/4 SE/4, SW/4 SE/4 SE/4
Section 31: W/2, SW/4 SE/4, W/2 NE/4, SE/4 NE/4, S/2 NE/4 NE/4, NW/4 NE/4 NE/4

TOWNSHIP 18 SOUTH, RANGE 35 EAST, NMPM
Section 6: N/2 NW/4, NW/4 NE/4, SW/4 NW/4, N/2 NE/4 N/4, SW/4 NE/4 NE/4, NW/4 SE/4 NE/4, N/2 SW/4 NE/4, N/2 SE/4 NW/4, SW/4 SE/4 NW/4, N/2 NW/4 SW/4, NW/4 NE/4 SW/4

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

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

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

(14) The subject tertiary recovery project is hereby designated the Central Vacuum Unit Tertiary Recovery Project and shall be governed by the provisions of Rules Nos. 701 through 708 of the Oil Conservation Division Rules and Regulations.

(15) Monthly progress reports of the tertiary recovery project herein authorized shall be submitted to the Division in accordance with Rules 706 and 1115 of the Division Rules and Regulations.

(16) Jurisdiction is hereby 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. 11650
ORDER NO. R-5530-E
TEXACO EXPLORATION AND PRODUCTION INC.
CENTRAL VACUUM UNIT
TERTIARY PROJECT INJECTION WELLS

WELL NO	FOOTAGE	U	SECTION	TWNSHP	RANGE	API NUMBERS
CVU #40	42' FNL, 1247' FWL	D	36	17S	34E	30-025-25703
CVU #41	60' FNL, 2552' FWL	C	36	17S	34E	30-025-25704
CVU #42	32' FNL, 1286' FEL	A	36	17S	34E	30-025-25705
CVU #43	35' FNL, 127' FEL	A	36	17S	34E	30-025-25706
CVU #44	134' FNL, 1219' FWL	D	31	17S	35E	30-025-25719
CVU #45	121' FNL, 2475' FWL	C	31	17S	35E	30-025-25720
CVU #46	119' FNL, 1224' FEL	A	31	17S	35E	30-025-25818
CVU #55	1310' FNL, 1310' FWL	D	36	17S	34E	30-025-25721
CVU #56	1310' FNL, 2630' FWL	C	36	17S	34E	30-025-25722
CVU #57	1310' FNL, 1330' FEL	B	36	17S	34E	30-025-25723
CVU #58	1310' FNL, 132' FEL	A	36	17S	34E	30-025-25724
CVU #59	1403' FNL, 1200' FWL	E	31	17S	35E	30-025-25725
CVU #60	1310' FNL, 2535' FWL	C	31	17S	35E	30-025-25707
CVU #61	1310' FNL, 1230' FEL	A	31	17S	35E	30-025-25819
CVU #70	2630' FNL, 1310' FWL	E	36	17S	34E	30-025-25726
CVU #71	2630' FNL, 2623' FEL	G	36	17S	34E	30-025-25727
CVU #72	2630' FNL, 1330' FEL	G	36	17S	34E	30-025-25697
CVU #73	2630' FNL, 142' FEL	H	36	17S	34E	30-025-25728
CVU #74	2561' FSL, 1180' FWL	L	31	17S	35E	30-025-25729
CVU #81	1332' FSL, 1310' FWL	L	36	17S	34E	30-025-25708
CVU #82	1333' FSL, 2528' FWL	K	36	17S	34E	30-025-25730
CVU #83	1330' FSL, 1330' FEL	J	36	17S	34E	30-025-25731
CVU #84	1333' FSL, 151' FEL	I	36	17S	34E	30-025-25732