Stewart Bros

Case No.

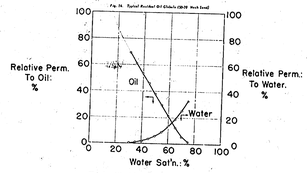
1787

Large Exhibits

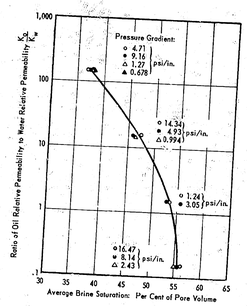
U.S.N.C.P. MICROGRAPHICS

BEST AVAILABLE COPY





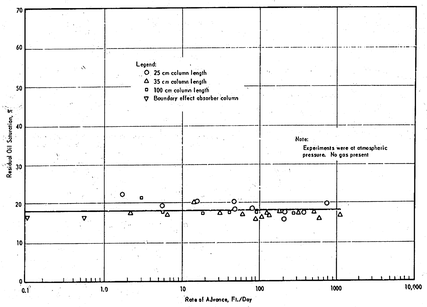
Typical Imbibition-Type Relative Permeability Curves



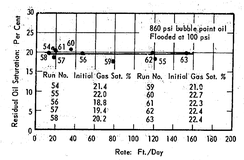
RELATIVE PERMEABILITY AS A FUNCTION OF BRINE SATURATION: MEASUREMENTS AT DIFFERENT PRESSURE GRADIENTS
(From Data of Geffen, Owens, Parrish & Morse)

U.N.N.C.F. MICROGRAPHICS

BEST AVAILABLE COPY



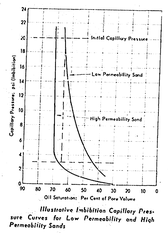
THE EFFECT OF RATE ON RECOVERY BY WATER FLOODING
(Homogeneous Sand)



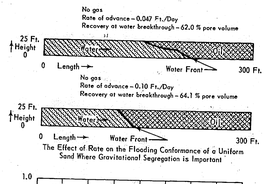
THE EFFECT OF RATE ON OIL RECOVERY BY WATER FLOODING IN PRESENCE OF A 22% FREE GAS SATURATION
(Homogeneous Sand)

U.N.M.C.F. MICROGRAPHICS

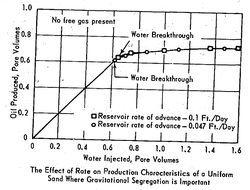
BEST AVAILABLE COPY



Illustrative Imbibition Capillary Pressure Curves for Low Permeability and High Permeability Sands



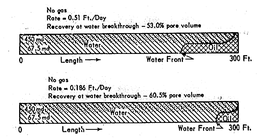
The Effect of Rate on the Flooding Conformance of a Uniform Sand Where Gravitational Segregation is Important



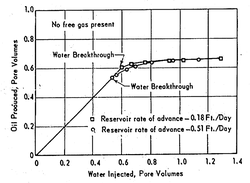
The Effect of Rate on Production Characteristics of a Uniform Sand Where Gravitational Segregation is Important

W.N.M.G.F. MICROGRAPHICS

BEST AVAILABLE COPY



The Effect of Rate on the Flooding Conformance of A Stratified Reservoir



The Effect of Rate on the Production Characteristics of A Stratified Reservoir

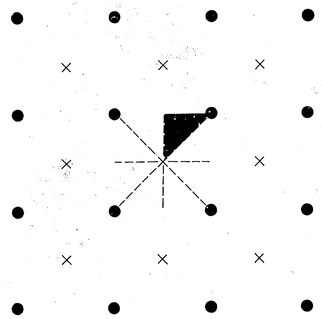
FIELD WATER-FLOOD PROPERTIES

Characteristics	Range of Values (9 water floods)	Representative Water Flood
Water-Flood Pattern	5-spot	5-spot
Areal Extent, acres	20, 40, 80	20
Net Stratum Thickness, ft	4-30	10
Porosity, %	14-33	20
Absolute Permeability, md	16-339	16-116
Connate Water Saturation, %	20-50	30
Residual Oil Saturation, %	26-2	20
Water-Oil Density Difference, gm/cc	0.15-0.30	0.20
Water Viscosity, cp	0.48-0.95	0.50
Oil Viscosity, cp	0.46-10	0.50, 2.17
Interfacial Tension, dyne/cm	25-35	25

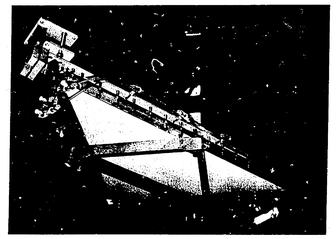
W.N.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY

TYPICAL 5 SPOT PATTERN



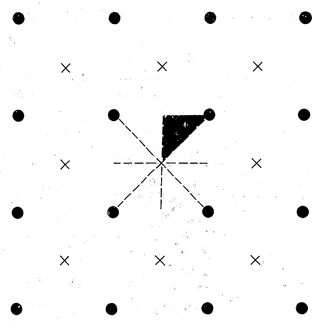
STRATIFIED 5-SPOT MODEL

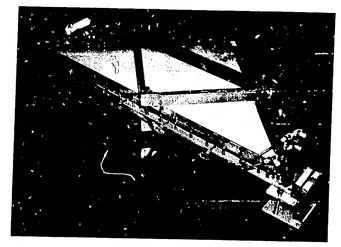


W.N.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY

TYPICAL 5 SPOT PATTERN

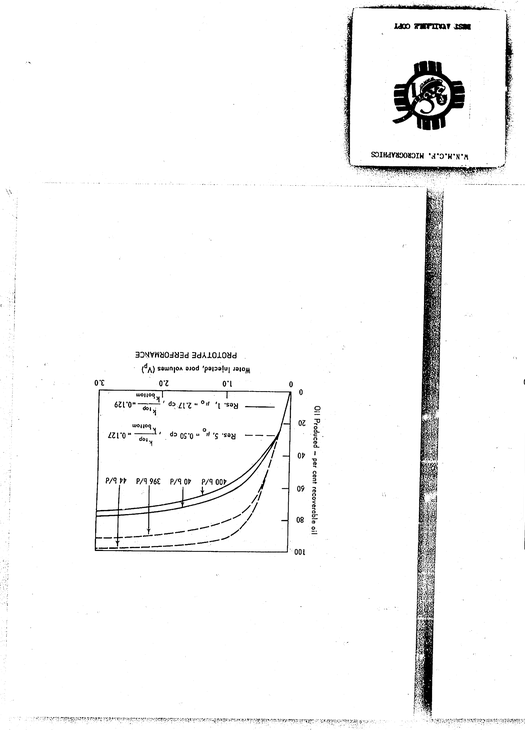




STRATIFIED 5-SPOT MODEL

W.M.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY


PROTOTYPE PERFORMANCE
Water injected, pore volumes (V_p)
0
1.0
2.0
3.0
0
20
40
60
80
100
Oil Produced – per cent recoverable oil
Res. 1, ρ_o = 2.17 cp, $\frac{k_{top}}{k_{bottom}}$ = 0.129
400 b/d
40 b/d

PROTOTYPE PERFORMANCE
Water injected, pore volumes (V_p)
0
1.0
2.0
3.0
0
20
40
60
80
100
Oil Produced – per cent recoverable oil
Res. 1, ρ_o = 2.17 cp, $\frac{k_{top}}{k_{bottom}}$ = 0.129
Res. 5, ρ_o = 0.50 cp, $\frac{k_{top}}{k_{bottom}}$ = 0.127
400 b/d
40 b/d
396 b/d
44 b/d

29; and the W/4 of the SW/4 of Section 21, all in Township 5 North, Range 6 East, Pontotoc County, Oklahoma; and the SE/4 of the NW/4 and E/2 of the SW/4 of the NE/4 of Section 29; and Lot 2, with riparian rights accretions thereto, Section 29; and the East 13.34 Acres of Lot 4 in Section 20; and Lot 1, approximately 53 Acres out of the Northeast corner of Section 29, all in Township 5 North, Range 6 East, Seminole County, Oklahoma.

which said lands are delineated upon plat included in the Plan of Unitization attached to the application. The plat referred to as Exhibit "A" in the Plan of Unitization pertains to the Thurman Sand Unit, and said plat is adopted and made a part hereof by reference thereto.

4. That the unit area hereinabove described is underlain by a portion of a common source of supply of oil and gas known as the Thurman Sand; the portion of such common source of supply within the unit area has been defined and determined to be productive of oil and gas by actual drilling operations.

That the unitized management, operation and further development of the Thurman Sand common source of supply in the unit area is reasonably necessary in order to effectively carry on pressure maintenance or repressuring operations or water-flooding operations, or any combination thereof, or any other form of joint effort calculated to substantially increase the ultimate recovery of oil and gas from the common source of supply; that one or more of said unitized methods of operation as applied to said common source of supply in the unit area are feasible, will prevent waste and will, with reasonable probability, result in the increased recovery of substantially more oil and gas from said common source of supply underlying the unit area than would otherwise be recovered; that the estimated additional cost of conducting such operations will not exceed the value of the additional oil and gas so recovered; the evidence shows that substantial quantities of oil will be recovered from said common source of supply under the unitized methods of operations contemplated, and such amounts will not be recoverable otherwise.

6. That the proposed unit and the adoption of one or more unitized methods of operation is for the common good and will result in the general advantage of the owners of the oil and gas rights within the common source of supply affected.

7. That the size and shape of the unit area of said unit is such as may be reasonably required for the successful and efficient conduct of the unitized method or methods of operation for which the unit is created, and that such unit and the conduct of unitized operations thereunder will have no material adverse effect upon the common source of supply or other common sources of supply, if any, within or without the unit area.

8. That the Plan of Unitization, filed herein and presented to the Commission for approval, is made a part hereof by reference thereto, is suited to the needs and requirements of the unit designated in said Plan as the Thurman Sand Unit; that the terms and provisions of said Plan of Unitization are adequate and are proper to effectuate and accomplish the purposes of the statute hereinabove referred to; that said Plan contains fair, reasonable and equitable provisions for: (a) the efficient unitized management and control of the further development and operation of the unit area for the recovery of oil and gas from the portion of the common source of supply affected; (b) a division of interest or formula for the apportionment and allocation of the unit production among and to the several separately owned tracts within the unit area such as will reasonably permit persons otherwise entitled to share in or benefit by the production from such separately owned tracts to produce or receive, in lieu thereof, their fair, equitable and reasonable share of the unit production or other benefits thereof; (c) the manner in which the unit and the further development and operation of the unit area shall or may be financed and the basis, terms and conditions on which the cost and expense thereof shall be apportioned among and assessed against the tracts and interests made chargeable therewith, including a detailed accounting procedure governing all charges and credits incidental to such operations, and the procedure for carrying or otherwise financing lessees who are unable to promptly meet their financial obligations in connection with the unit; (d) the procedure and basis upon which wells, equipment and other properties of the several lessees within the unit area are to be taken over and used for unit operations, including the method of arriving at the compensation therefor or of otherwise proportionately equalizing or adjusting the

Cause CD No. 12433 Page 2 Order No. 40413

O R D E R

IT IS THEREFORE ORDERED by the Corporation Commission of Oklahoma that Wilcox Oil Company be and it is hereby, permitted and authorized to operate a unitized in the Hunton Zone underlying the SW/4 NE/4 and the SE/4 NW/4 and the E/2 of Section 25, Township 15 North, Range 11 East, and the E/2 NW/4 and the NW/4 NE/4 and the W/2 NE/4 NE/4 and the W/2 E/2 NE/4 NE/4 of Section 2, Township 14 North, Range 11 East, Canadian County, Oklahoma.

IT IS FURTHER ORDERED that the daily production from this unitized operation shall be limited to that amount of oil calculated by multiplying the number of oil-producing wells on the lease times the basic daily oil allowable fixed by the Commission for unallocated wells in the State.

IT IS FURTHER ORDERED that this unitized shall be operated in such a manner that no detriment or damage will be done to any oil, gas or fresh water bearing formation.

DONE AND PERFORMED this 3rd day of September, 1959.

CORPORATION COMMISSION OF OKLAHOMA

Ray M. Jones, Chairman

Wilburn Cavenaugh, Vice-Chairman

Harold Freeman, Commissioner

ATTEST:

Carl B. Mitchell
Secretary

wd

W.N.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY

BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHO

IN THE MATTER OF THE APPLICATION OF NORTHE OIL & GAS COMPANY FOR AN ORDER PROVIDING FOR THE WATERFLOODING AND OTHER METHODS OF UNITIZED MANAGEMENT, OPERATION AND FURTHER DEVELOPMENT OF THE OIL AND GAS PROPERTIES AND THE THURMAN SAND UNDERLYING THE FOLLOWING DESCRIBED LAND: WEST 8.60 ACRES OF LOT 7, LOT 8, ALL IN SECTION 20; AND LOT 6 IN SECTION 29; TOGETHER WITH RIPARIAN RIGHTS AND ACCRETED LANDS THERETO BELONGING AND THE N/2 OF THE NW/4 OF SECTION 28; AND THE NE/4 OF THE SE /4 OF SECTION 20; AND THE NORTH 10 ACRES OF E/2 OF THE SE/4 OF THE NE/4 OF SECTION 29; AND THE NE /4 OF THE SW/4 OF SECTION 21, ALL IN TOWNSHIP 5 NORTH, RANGE 6 EAST, POTTOTOC COUNTY, OKLAHOMA; AND THE SE/4 OF THE NW/4 AND E/2 OF THE SW/4 OF THE NE/4 OF SECTION 29; AND LOT 2, WITH RIPARIAN RIGHTS AND ACCRETIONS THERETO, SECTION 29; AND THE EAST 13.34 ACRES OF LOT 4 IN SECTION 20; AND LOT 1, APPROXIMATELY 53 ACRES OUT OF THE NORTHEAST CORNER OF SECTION 29, ALL IN TOWNSHIP 5 NORTH, RANGE 6 EAST, SEMINOLE COUNTY, OKLAHOMA.

CAUSE CD NO. 12379

OR DER NO. 40245

REPORT OF THE COMMISSION

This cause came on for hearing before the Corporation Commission of Oklahom on the 31st day of July, 1959, at 10 o'clock a.m., in the Commission's Courtroom, Capitol Office Building, Oklahoma City, Oklahoma, the Honorable Ray C. Jones, Chairman, Wilburn Cartwright, Vice-Chairman, and Harold Freeman, Commissioner, sitting.

James W. George, Attorney, appeared for the applicant, the Norton Oil & Gas Company; Farrell H. Rogers, Conservation Attorney, and L. D. Hoyt, Assistant Conservation Attorney, appeared for the Commission.

The case was called and referred to W. H. Sellers, Trial Examiner, for the purpose of taking testimony and reporting to the Commission.

The Trial Examiner proceeded to hear the cause and has filed his report herein, recommending that the application be granted; the report and recommendation are hereby adopted and the Commission therefore finds as follows:

F I N D I N G S

1. That this is an Application of Norton Oil & Gas Company for an order approving the creation of and bringing the Bynum, Conservation and Unity Fields Thurman Sand Unit, herein called "Thurman Sand Unit", and prescribing a plan of unitization for such unit, said plan being as its purpose the unitized management, operation and further development of a portion of the common source of supply covered thereby and underlying lands in Seminole County and Pontotoc County, Oklahoma, pursuant to the provisions of Senate Bill 283 of the 1951 Legislature, being Sections 287.1 to 287.15, inclusive, Oklahoma Statutes 1951.

2. That notice of hearing on said Application has been duly and properly given in all respects as required by law and the Commission has jurisdiction of the subject matter and of the persons interested therein; and has jurisdiction to enter an order in this cause; that no opposition to the granting of the application was made at the hearing.

3. That the unit area for the Thurman Sand Unit, which applicant desires to unitize under the provisions of the law referred to, consists of the following described tracts of land in Seminole County and Pontotoc County, Oklahoma, to-wit:

West 8.60 Acres of Lot 7, Lot 8, all in Section 20; and Lot 6 in Section 29; together with riparian rights and accreted lands thereunto belonging; and the N/2 of the NW/4 of Section 28; and the NE/4 of the SE/4 of Section 20; and the North 10 Acres of E/2 of the SE/4 of the NE/4 of Section

BEFORE OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT No. 3
CASE

BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA

APPLICATION OF WILCOX OIL COMPANY FOR AUTHORITY TO WATERFLOOD THE DUTCHER SAND (UNDERLYING THE SOUTHWEST QUARTER OF THE NORTHEAST QUARTER (SW/4 NE/4) AND THE SOUTHEAST QUARTER OF THE NORTHWEST QUARTER (SE/4 NW/4) AND THE SOUTH HALF (S/2) OF SECTION THIRTY-FIVE (35); TOWNSHIP FIFTEEN NORTH (15N), AND THE NORTH HALF OF THE NORTHEAST QUARTER (N/2 NE/4) AND THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER (NW/4 NE/4) AND THE WEST HALF OF THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER (N/2 NE/4 NE/4) AND THE WEST HALF OF THE WEST HALF OF THE EAST HALF OF THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER (W/2 W/2 E/2 NE/4) OF SECTION TWO (2) TOWNSHIP FOURTEEN NORTH (14N), ALL OF THE ABOVE DESCRIBED LANDS BEING IN RANGE ELEVEN (11) EAST, OKMULGEE COUNTY, OKLAHOMA.

CAUSE CD NO. 18433

ORDER NO. 40413

REPORT OF THE COMMISSION

This cause came on for hearing before the Corporation Commission of Oklahoma on the 3rd day of September, 1959, at 10 o'clock a.m., in the Commission's Courtroom, Capitol Office Building, Oklahoma City, Oklahoma; the Honorable Ray C. Jones, Chairman, Wilburn Cartwright, Vice-Chairman, and Harold Freeman, Commissioner, sitting.

Frank S. Turner, Attorney, appeared for the applicant, Wilcox Oil Company; Farrell H. Rogers, Conservation Attorney, and Lester D. Hoyt, Assistant Conservation Attorney, appeared for the Commission.

The case was called and referred to W. H. Sellers, Trial Examiner, for the purpose of taking testimony and reporting to the Commission.

The Trial Examiner heard the cause and has filed his report recommending that the application be granted, which report and recommendation are hereby adopted and the Commission therefore finds as follows:

F I N D I N G S

1. That this is an application of Wilcox Oil Company for permission and authority to waterflood in the Dutcher Sand underlying the SW/4 NE/4 and the SE/4 NW/4 and the E/2 Section 35, Township 15 North, Range 11 East and the W/2 NE/4 and the NE/4 SE/4 and the W/2 NE/4 NE/4 and the W/2 W/2 E/2 NE/4 NE/4 of Section 2, Township 14 North, Range 11 East, Okmulgee County, Oklahoma.

2. That the Commission has jurisdiction over the subject matter hereof; that notice has been given in all respects as required by Law and the rules of the Commission and no protests have been entered to the granting of the application.

3. That the applicant is the owner and operator of oil and gas leases on the above described land on which some 70 wells were drilled and completed in the Dutcher Sand found at the approximate depth of 2260 feet in about the year 1919 and all of said wells produced to depletion and were abandoned.

4. That the applicant believes there are substantial quantities of oil in said formation underlying said land that can be recovered by operating a waterflood therein that would otherwise be lost; that all wells are or will be sealed to or through the sand and cemented.

4. That in the interest of securing the greatest ultimate recovery of oil from the pool, the prevention of waste and the protection of correlative rights, this application should be granted.

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT No. 4
CASE

W.N.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY

BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA

IN THE MATTER OF THE APPLICATION OF C & S OIL COMPANY, A CO-PARTNERSHIP, COMPOSED OF O. W. CLAY AND E. E. SMITH, FOR AN ORDER PERMITTING THE INJECTION OF WATER FOR THE PURPOSE OF SECONDARY RECOVERY OF THE LOGE SAND AS TO THE NE/4 OF SW/4, AND NE/4 OF NW/4, OF SEC. 14, TOWNSHIP 3 SOUTH, RANGE 5 WEST, STEPHENS COUNTY, OKLAHOMA.

CAUSE CD NO. 12,343

ORDER NO. 40440

REPORT OF THE COMMISSION

This cause came on for hearing before the Corporation Commission of Oklahoma on the 9th day of September, 1939, at 10 o'clock a. m., in the Commission's Courtroom, Capitol Office Building, Oklahoma City, Oklahoma; the Honorable Roy C. Jones, Chairman, Wilburn Cartwright, Vice-Chairman, and Harold Freeman, Commissioner, sitting.

E. E. Smith appeared for the applicant, C & S Oil Company, a co-partnership, composed of O. W. Clay and E. E. Smith; and Purrill H. Rogers, Conservation Attorney, and Lester D. Hayt, Assistant Conservation Attorney, appeared for the Commission.

The cause was called and referred to H. H. Sellers, Trial Examiner, for the purpose of taking testimony and reporting to the Commission.

The Trial Examiner heard the cause and has filed his report recommending that the application be granted, which report and recommendation are hereby adopted and the Commission therefore finds as follows:

FINDINGS

1. That this is an application of C & S Oil Company, a co-partnership, composed of O. W. Clay and E. E. Smith, for permission and authority to operate a waterflood in the Loge Sand underlying the E/2 of the SW/4 of Section 14, Township 3 South, Range 5 West, Stephens County, Oklahoma.

2. That the Commission has jurisdiction over the subject matter hereto; that notice has been given in all respects as required by law and the rules of the Commission and no protests have been entered to the granting of the application.

3. That the applicant is the owner and operator of an oil and gas lease on the above described land on which there are 6 wells completed in the Loge Sand between the depths of 900 feet and 920 feet and said wells are producing approximately 4 barrels of oil per well per day.

4. That the applicant believes there are substantial quantities of oil in said formation underlying said land that can be recovered by operating a waterflood therein that would otherwise be lost; that all wells are or will be cased through the sand and cemented.

5. That in the interest of securing the greatest ultimate recovery of oil from the pool, the prevention of waste and the protection of correlative rights, this application should be granted.

ORDER

IT IS THEREFORE ORDERED by the Corporation Commission of Oklahoma that C & S Oil Company, a co-partnership, composed of O. W. Clay and E. E. Smith, be and it is hereby permitted and authorized to operate a waterflood in the Loge Sand underlying the E/2 of the SW/4 of Section 14, Township 3 South, Range 5 West, Stephens County, Oklahoma.

IT IS FURTHER ORDERED that the daily production from this waterflood operation shall be limited to that amount of oil calculated by multiplying the number of oil-producing wells on the lease times the basic daily oil allowable fixed by the Commission for unallocated wells in the state.

IT IS FURTHER ORDERED that this waterflood shall be operated in such a manner that no ... detriment or damage will be done to any oil, gas or fresh water bearing formation.

DONE AND PERFORMED this 9th day of September, 1939.

CORPORATION COMMISSION OF OKLAHOMA

Roy C. Jones, Chairman

Wilburn Cartwright, Vice-Chairman

ATTEST:

Secretary

Harold Freeman, Commissioner

BEFORE THE OIL CONSERVATION COMMISSION SANTA FE, NEW MEXICO EXHIBIT No. 62 CASE

In

BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA

IN THE MATTER OF THE APPLICATION OF C & S OIL COMPANY, A CO-PARTNERSHIP, COMPOSED OF O. W. CLAY AND E. E. SMITH FOR AN ORDER PERMITTING THE INJECTION OF WATER FOR THE PURPOSE OF SECONDARY RECOVERY OF THE LOGE SAND AS TO NE/4 NW/4 AND THE NE/4 SE/4 OF SECTION 13, TOWNSHIP 3 SOUTH, RANGE 5 WEST, STEPHENS COUNTY, OKLAHOMA.

CAUSE CD NO. 12,344

ORDER NO. 40441

REPORT OF THE COMMISSION

This cause came on for hearing before the Corporation Commission of Oklahoma on the 9th day of September, 1939, at 10 o'clock a. m., in the Commission's Courtroom, Capitol Office Building, Oklahoma City, Oklahoma; the Honorable Roy C. Jones, Chairman, Wilburn Cartwright, Vice-Chairman, and Harold Freeman, Commissioner, sitting.

E. E. Smith appeared for the applicant, C & S Oil Company, a co-partnership, composed of O. W. Clay and E. E. Smith; and Purrill H. Rogers, Conservation Attorney, and Lester D. Hayt, Assistant Conservation Attorney, appeared for the Commission.

The cause was called and referred to H. H. Sellers, Trial Examiner, for the purpose of taking testimony and reporting to the Commission.

The Trial Examiner heard the cause and has filed his report recommending that the application be granted, which report and recommendation are hereby adopted and the Commission therefore finds as follows:

FINDINGS

1. That this is an application of C & S Oil Company, a co-partnership, composed of O. W. Clay and E. E. Smith, for permission and authority to operate a waterflood in the Loge Sand underlying the E/2 of the E/2 of the W/2 of the NE/4 and the E/2 of the NE/4 of the NW/4 and the E/2 of the SW/4 of the NE/4 of Section 13, Township 3 South, Range 5 West, Stephens County, Oklahoma.

2. That the Commission has jurisdiction over the subject matter hereto; that notice has been given in all respects as required by law and the rules of the Commission and no protests have been entered to the granting of the application.

3. That the applicant is the owner and operator of an oil and gas lease on the above described land on which there are 12 wells completed in the Loge Sand found between the depths of 900 feet and 920 feet and said wells are producing approximately 2 barrels of oil per well per day.

4. That the applicant believes there are substantial quantities of oil in said formation underlying said land that can be recovered by operating a waterflood therein that would otherwise be lost; that all wells are or will be cased through the sand and cemented.

5. That in the interest of securing the greatest ultimate recovery of oil from the pool, the prevention of waste and the protection of correlative rights, this application should be granted.

ORDER

IT IS THEREFORE ORDERED by the Corporation Commission of Oklahoma that C & S Oil Company, a co-partnership, composed of O. W. Clay and E. E. Smith, be and it is hereby permitted and authorized to operate a waterflood in the Loge Sand underlying the E/2 of the E/2 of the W/2 of the NE/4 and the E/2 of the NE/4 of the NW/4 and the E/2 of the SW/4 of the NE/4 of Section 13, Township 3 South, Range 5 West, Stephens County, Oklahoma.

IT IS FURTHER ORDERED that the daily production from this waterflood operation shall be limited to that amount of oil calculated by multiplying the number of oil-producing wells on the lease times the basic daily oil allowable fixed by the Commission for unallocated wells in the state.

IT IS FURTHER ORDERED that this waterflood shall be operated in such a manner that no detriment or damage will be done to any oil, gas or fresh water bearing formation.

DONE AND PERFORMED this 9th day of September, 1939.

CORPORATION COMMISSION OF OKLAHOMA

Roy C. Jones, Chairman

Wilburn Cartwright, Vice-Chairman

ATTEST:

Secretary

Harold Freeman, Commissioner

BEFORE THE OIL CONSERVATION COMMISSION SANTA FE, NEW MEXICO EXHIBIT No. 63 CASE

In

W.N.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY

BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA

IN THE MATTER OF THE APPLICATION OF GENERAL AMERICAN OIL COMPANY OF TEXAS, A CORPORATION, FOR AUTHORITY TO CONDUCT WATERFLOOD OPERATIONS IN THE PERU SAND, CORDELL SUBDIV. OF SEPOY UNDERLYING THE NE/4 OF SECTION 13, AND LOTS 1, 2, 3 AND 4 AND THE SW/4, TOWNSHIP 18 NORTH, RANGE 4 EAST, NOBLE COUNTY, OKLAHOMA.

CAUSE CD NO. 12,309

ORDER NO. 40101

REPORT OF THE COMMISSION

This cause came on for hearing before the Corporation Commission of Oklahoma on the 25th day of June, 1959, at 10 o'clock a. m., in the Commission's Courtroom, Capitol Office Building, Oklahoma City, Oklahoma; the Honorable Ray C. Jones, Chairman, Wilburn Cartwright, Vice-Chairman, and Harold Freeman, Commissioner, sitting.

Jack High, Attorney, appeared for the applicant, General American Oil Company of Texas; Geo. Gugel, Attorney, appeared for United Producing Company, Inc.; and Farrell H. Rogers, Conservation Attorney, and Lester D. Hoyt, Assistant Conservation Attorney, appeared for the Commission.

The case was called and referred to W. H. Sellers, Trial Examiner, for the purpose of taking testimony and reporting to the Commission.

The Trial Examiner heard the cause and has filed his report recommending that the application be granted, which report and recommendation are hereby adopted and the Commission therefore finds as follows:

FINDINGS

1. That this is an application of General American Oil Company of Texas for permission and authority to operate a waterflood in the Peru Sand underlying the NE/4 of Section 13, and Lots 1, 2, 3 and 4 and the SW/4 of the NW/4, together with all accretions and riparian rights to the center of the Cimarron River in Section 13, all in Township 18 North, Range 4 East, Noble County, Oklahoma.

2. That the Commission has jurisdiction over the subject matter hereto; that notice has been given in all respects as required by law and the rules of the Commission and no protests have been entered to the granting of the application; and United Producing Company, Inc., concurs in the application.

3. That the applicant and the United Producing Company, Inc., are the owners of oil and gas leases on the above described land the General American Oil Company of Texas as the operator; that seven wells have heretofore been completed in the Peru Sand on the above described lands and at this time six of said wells are producing an average of approximately 5 barrels of oil per day.

4. That the applicant believes there are substantial quantities of oil in said formation underlying said land that can be recovered by operating a waterflood therein that would otherwise be lost; that all wells are or will be cased to or through the sand and cemented.

5. That it is possible that some restriction will have to be made on the amount of oil that can be produced from waterflood projects in this state, and the operator of this waterflood should take notice of this condition at this time, and conduct the operation of this waterflood in such a manner that compliance can be made with any order of the Commission placing a restriction on the amount of oil that can be produced from this waterflood project.

6. That in the interest of securing the greatest ultimate recovery of oil from the pool, the prevention of waste and the protection of correlative rights, this application should be granted.

ORDER

IT IS THEREFORE ORDERED by the Corporation Commission of Oklahoma that General American Oil Company of Texas be and it is hereby permitted and authorized to operate a waterflood in the Peru Sand underlying the NE/4 of Section 13, and lots 1, 2, 3 and 4 and the SW/4 of the NW/4, together with all accretions and riparian rights to the center of the Cimarron River in Section 12, all in Township 18 North, Range 4 East, Noble County, Oklahoma.

IT IS FURTHER ORDERED that this waterflood shall be operated in such a manner that no detriment or damage will be done to any oil, gas or fresh water bearing formation.

DONE AND PERFORMED this 25th day of June, 1959.

CORPORATION COMMISSION OF OKLAHOMA

Ray C. Jones, Chairman

Wilburn Cartwright, Vice-Chairman

ATTEST:
Earl B. Mitchell
Secretary

Harold Freeman, Commissioner

ln

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT No. 5
Obs.

BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA

IN THE MATTER OF THE APPLICATION OF MURPHY OIL COMPANY OF OKLAHOMA FOR PERMISSION TO WATERFLOOD THE THOMAS SAND UNDERLYING THE E/2 AND THE SW/4 OF SECTION 6, TOWNSHIP 5 SOUTH, RANGE 12 WEST, COTTON COUNTY, OKLAHOMA.

CAUSE CD NO. 12,303

ORDER NO. 40061

REPORT OF THE COMMISSION

This cause came on for hearing before the Corporation Commission of Oklahoma on the 9th day of July, 1959, at 10 o'clock a.m., in the Commission's Courtroom, Capitol Office Building, Oklahoma City, Oklahoma; the Honorable Ray C. Jones, Chairman, Wilburn Cartwright, Vice-Chairman, and Harold Freeman, Commissioner, sitting.

David M. Thornton, Attorney, appeared for the applicant, Murphy Oil Company; Farrell H. Rogers, Conservation Attorney, and Lester D. Hoyt, Assistant Conservation Attorney, appeared for the Commission.

The case was called and referred to W. H. Sellers, Trial Examiner, for the purpose of taking testimony and reporting to the Commission.

The Trial Examiner heard the cause and has filed his report recommending that the application be granted, which report and recommendation are hereby adopted and the Commission therefore finds as follows:

F I N D I N G S

1. That this is an application of Murphy Oil Company of Oklahoma, Inc., for permission and authority to operate a waterflood in the Thomas Sand underlying the E/2 of Section 6, Township 5 South, Range 12 West, Cotton County, Oklahoma.

2. That the Commission has jurisdiction over the subject matter hereto; that notice has been given in all respects as required by law and the rules of the Commission and no protests have been entered to the granting of the application.

3. That the applicant is the owner and operator of oil and gas leases on the above described land on which some 30 wells have been completed in the Thomas Sand found at the approximate depth of 1550 feet, and some 20 of said wells are producing a total of approximately 40 barrels of oil per day.

4. That the applicant believes there are substantial quantities of oil in said formation underlying said land that can be recovered by operating a waterflood therein that would otherwise be lost; that all wells are or will be cased to the top of the sand and cemented.

5. That in the interest of securing the greatest ultimate recovery of oil from the pool, the prevention of waste and the protection of correlative rights, this application should be granted.

O R D E R

IT IS THEREFORE ORDERED by the Corporation Commission of Oklahoma that Murphy Oil Company of Oklahoma, Inc., be and it is hereby permitted and authorized to operate a waterflood in the Thomas Sand underlying the E/2 of Section 6, Township 5 South, Range 12 West, Cotton County, Oklahoma.

IT IS FURTHER ORDERED that the daily production from this waterflood operation shall be limited to that amount of oil calculated by multiplying the number of oil-producing wells on the lease times the basic daily oil allowable fixed by the Commission for unelocated wells in the state.

IT IS FURTHER ORDERED that this waterflood shall be operated in such a manner that no detriment or damage will be done to any oil, gas or fresh water bearing formation.

DONE AND PERFORMED this 9th day of July, 1959.

CORPORATION COMMISSION OF OKLAHOMA

Ray C. Jones, Chairman

ATTEST:
Earl B. Mitchell
Secretary

Wilburn Cartwright, Vice-Chairman

Harold Freeman, Commissioner

wd

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT No. 6
CASE

N.M.M.C.P. MICROGRAPHICS

BEST AVAILABLE COPY

BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA

IN THE MATTER OF THE APPLICATION OF WILLIAM J. LAMBERTON FOR AUTHORITY TO CONDUCT WATERFLOOD OPERATIONS UPON THE NORTHWEST QUARTER (NW/4) OF SECTION 17, TOWNSHIP 14 NORTH, RANGE 13 EAST, OKMULGEE COUNTY, OKLAHOMA, IN THE BARTLESVILLE SAND.

CAUSE CD NO. 12,348

ORDER NO. 40128

REPORT OF THE COMMISSION

This cause came on for hearing before the Corporation Commission of Oklahoma on the 16th day of July, 1959, at 10 o'clock a. m., in the Commission's Courtroom, Capitol Office Building, Oklahoma City, Oklahoma; the Honorable Ray C. Jones, Chairman, Wilburn Cartwright, Vice-Chairman, and Harold Freeman, Commissioner, sitting.

R. Robert Huff, Attorney, appeared for the applicant, William J. Lamberton; and Ferrill M. Rogers, Conservation Attorney, and Lester D. Hunt, Assistant Conservation Attorney, appeared for the Commission.

The case was called and referred to W. H. Sellers, Trial Examiner, for the purpose of taking testimony and reporting to the Commission.

The Trial Examiner heard the cause and has filed his report recommending that the application be granted, which report and recommendation are hereby adopted and the Commission therefore finds as follows:

FINDINGS

1. That this is an application of William J. Lamberton for permission and authority to operate a waterflood in the Bartlesville Sand underlying the NW/4 of Section 17, Township 14 North, Range 13 East, Okmulgee County, Oklahoma.

2. That the Commission has jurisdiction over the subject matter hereto; that notice has been given in all respects as required by law and the rules of the Commission and no protests have been entered to the granting of the application.

3. That the applicant is the operator of an oil and gas lease on the above described land on which there are 3 wells completed in the Bartlesville Sand at the approximate depth of 1,130 feet which are producing a total of approximately 20 barrels of oil per day.

4. That the applicant believes there are substantial quantities of oil in said formation underlying said land that can be recovered by operating a waterflood therein that would otherwise be lost; that all wells are owned through the sand and commoned.

5. That in the interest of securing the greatest ultimate recovery of oil from the pool, the prevention of waste and the protection of correlative rights, this application should be granted.

ORDER

IT IS THEREFORE ORDERED by the Corporation Commission of Oklahoma that William J. Lamberton be and he is hereby permitted and authorized to operate a waterflood in the Bartlesville Sand underlying the NW/4 of Section 17, Township 14 North, Range 13 East, Okmulgee County, Oklahoma.

IT IS FURTHER ORDERED that the daily production from this waterflood operation shall be limited to that amount of oil calculated by multiplying the number of oil-producing wells on the lease times the basic daily oil allowable fixed by the Commission for unallocated wells in the state.

IT IS FURTHER ORDERED that this waterflood shall be operated in such a manner that no detriment or damage will be done to any oil, gas or fresh water bearing formation.

DONE AND PERFORMED this 16th day of July, 1959.

CORPORATION COMMISSION OF OKLAHOMA

Ray C. Jones
Ray C. Jones, Chairman

Wilburn Cartwright
Wilburn Cartwright, Vice-Chairman

ATTEST:

Harold Freeman
Harold Freeman, Commissioner

Carl B. Hatchett
Secretary

In BEFORE THE OIL CONSERVATION COMMISSION SANTA FE, NEW MEXICO EXHIBIT No. 13 CASE

BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA

IN THE MATTER OF THE APPLICATION OF PAN AMERICAN PETROLEUM CORPORATION FOR PERMISSION TO WATERFLOOD AN AREA IN THE FRIDAY SAND COMMON SOURCE OF SUPPLY IN THE WALKERS FIELD, COTTON COUNTY, OKLAHOMA

CAUSE CD NO. 12,346

ORDER NO. 40133

REPORT OF THE COMMISSION

This cause came on for hearing before the Corporation Commission of Oklahoma on the 16th day of July, 1959, at 10 o'clock a. m., in the Commission's Courtroom, Capitol Office Building, Oklahoma City, Oklahoma; the Honorable Ray C. Jones, Chairman, Wilburn Cartwright, Vice-Chairman, and Harold Freeman, Commissioner, sitting.

Marion Standeven, Attorney, appeared for the applicant, Pan American Petroleum Corporation; and Ferrill M. Rogers, Conservation Attorney, and Lester D. Hunt, Assistant Conservation Attorney, appeared for the Commission.

The case was called and referred to W. H. Sellers, Trial Examiner, for the purpose of taking testimony and reporting to the Commission.

The Trial Examiner heard the cause and has filed his report recommending that the application be granted, which report and recommendation are hereby adopted and the Commission therefore finds as follows:

FINDINGS

1. That this is an application of Pan American Petroleum Corporation for permission and authority to operate a waterflood in the Friday Sand underlying the NW/4 of Section 3 and the SE/4 of Section 4 except a 15-acre tract in the Southeast corner of said Section 4, all in Township 2 South, Range 10 West, Cotton County, Oklahoma.

2. That the Commission has jurisdiction over the subject matter hereto; that notice has been given in all respects as required by law and the rules of the Commission and no protests have been entered to the granting of the application.

3. That the applicant and the Magnolia Petroleum Company and the Tennessee Gas Transmission Company are the owners of oil and gas leases on the above described land and the Pan American Petroleum Corporation is designated as the operator thereof; that there are 21 wells now located on said lands that are completed in the Friday Sand found at the approximate depth of 2,150 feet that are producing a total of approximately 80 barrels of oil per day.

4. That the applicant believes there are substantial quantities of oil in said formation underlying said land that can be recovered by operating a waterflood therein that would otherwise be lost; that all wells are or will be owned to the Friday Sand and commoned.

5. That in the interest of securing the greatest ultimate recovery of oil from the pool, the prevention of waste and the protection of correlative rights, this application should be granted.

ORDER

IT IS THEREFORE ORDERED by the Corporation Commission of Oklahoma that Pan American Petroleum Corporation be and it is hereby permitted and authorized to operate a waterflood in the Friday Sand underlying the NW/4 of Section 3 and the SE/4 of Section 4 except a 15-acre tract in the Southeast corner of said Section 4, all in Township 2 South, Range 10 West, Cotton County, Oklahoma.

IT IS FURTHER ORDERED that the daily production from this waterflood operation shall be limited to that amount of oil calculated by multiplying the number of oil-producing wells on the lease times the basic daily oil allowable fixed by the Commission for unallocated wells in the state.

IT IS FURTHER ORDERED that this waterflood shall be operated in such a manner that no detriment or damage will be done to any oil, gas or fresh water bearing formation.

DONE AND PERFORMED this 16th day of July, 1959.

CORPORATION COMMISSION OF OKLAHOMA

Ray C. Jones
Ray C. Jones, Chairman

Wilburn Cartwright
Wilburn Cartwright, Vice-Chairman

ATTEST:

Carl B. Hatchett
Secretary

Harold Freeman
Harold Freeman, Commissioner

In BEFORE THE OIL CONSERVATION COMMISSION SANTA FE, NEW MEXICO EXHIBIT No. 14 CASE

W.N.M.C.P. MICROGRAPHICS

BEST AVAILABLE COPY

investment of the several lessees in the project as of the effective date of unit operations; (e) the creation of an operating committee and appropriate sub-committee for the general overall management and control of the unit and the conduct of its business and affairs and the operations carried on by it; (f) the time when the Plan of Unitization shall become and be effective, and (g) the time when, and conditions under which, and the method by which the unit shall or may be dissolved and its affairs wound up.

9. That the application herein and the Plan of Unitization, with respect to such unit, presented for approval conform to and comply with the requirements of Senate Bills 203 of the [redacted] Legislature, being Sections 287.1 to 287.13, inclusive, Oklahoma Statutes 1951; that said Plan has been accepted and signed by more than 63.00 percent of the lessees of record within the unit area; that said Plan of Unitization has been signed or in writing ratified and approved by more than 63.00 percent of the owners of record of the normal one-eighth (1/8th) royalty interest within the unit area, exclusive of royalty interests owned by lessees or by subsidiaries of any lessee.

10. The amount of oil to be produced from this Unit should be fixed by the Commission at each regular market demand hearing.

11. That the application herein is supported by substantial evidence, and, in order to secure the greatest ultimate recovery of oil from the common source of supply covered hereby, to prevent waste and to protect correlative rights, this application should be granted.

ORDER

IT IS THEREFORE ORDERED by the Corporation Commission of the State of Oklahoma, as follows:

1. That the petition filed herein be, and the same is hereby granted.

2. That the creation of the Byng, Conservation and Watley Fields Thurman Sand Unit is hereby approved and same is hereby created in accordance with and upon and subject to the terms, provisions and conditions of the Plan of Unitization referred to above.

3. That the Plan of Unitization, which is attached to the application herein, is made a part of this order by reference, and is hereby approved, and such Plan of Unitization shall constitute the Plan of Unitization in and for said Unit and the unit area of such unit, all to the same extent and with the same force and effect as if copied herein in its entirety.

4. That the unit area of the unit so created shall include all of the lands which are hereinabove described, being the tracts shown on the plat which is attached to the Plan of Unitization, marked Exhibit "A".

5. That each of such tracts located in the unit area shall become, subject to the terms and provisions of the Plan of Unitization, participants in the unit production and in the other benefits and burdens of the Unit in accordance with the provisions of the Plan of Unitization.

6. That such unit and the unit operator shall, from time to time, make such reports to the Commission concerning the operation of the unit as may be requested by the Commission.

7. That the amount of oil to be produced from this unit shall be fixed by the Commission at each regular market demand hearing.

8. That the Commission retains continuing jurisdiction over said unit for the purpose of amending, modifying and interpreting of the terms and provisions of this order and the Plan of Unitization of said unit.

9. This order shall become effective immediately

DONE AND PERFORMED this 31st day of July, 1959.

CORPORATION COMMISSION OF OKLAHOMA

Ray C. Jones, Chairman

William Cartwright, Vice-Chairman

ATTEST: Carl B. Mitchell, Secretary — Harold Freeman, Commissioner

BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA

IN THE MATTER OF THE APPLICATION OF GREAT PLAINS PETROLEUM CORPORATION FOR PERMISSION TO INJECT SALT WATER INTO THE PENN SAND FORMATION FOR THE PURPOSE OF SECONDARY RECOVERY OPERATIONS IN AND UNDER LOTS ONE (1) AND TWO (2) OABLE THE N/2 OF THE NW/4) AND THE NE/4 OF THE NE/4 AND THE S/2 OF THE NE/4 OF THE NW/4 AND THE NE/4 OF THE NE/4 OF THE NW/4 OF SECTION THIRTY-ONE (31), TOWNSHIP FIFTEEN (15) NORTH, RANGE EIGHT (8) EAST, CREEK COUNTY, OKLAHOMA

CAUSE CD NO. 12,419

ORDER NO. #0362

REPORT OF THE COMMISSION

This cause came on for hearing before the Corporation Commission of Oklahoma on the 31st day of July, 1959, at 10 o'clock a. m., in the Commission's Courtroom, Capitol Office Building, Oklahoma City, Oklahoma; the Honorable Ray C. Jones, Chairman, Wilburn Cartwright, Vice-Chairman, and Harold Freeman, Commissioner, sitting.

Everett Berry, Robert Burton and Don Worthington, Attorneys, appeared for the applicant, Great Plains Petroleum Corporation; and Farrell S. Rogers, Conservation Attorney, and Looker D. Hoyt, Assistant Conservation Attorney, appeared for the Commission.

The case was called and referred to W. H. Sellers, Trial Examiner, for the purpose of taking testimony and reporting to the Commission.

The Trial Examiner heard the cause and has filed his report recommending that the application be granted, which report and recommendation are hereby adopted and the Commission therefore finds as follows:

FINDINGS

1. That this is an application of Great Plains Petroleum Corporation for permission and authority to operate a waterflood in the Penn Sand underlying Lots 1 and 2 (being the W/2 of the NW/4) and the SE/4 of the NW/4 and the S/2 of the NE/4 of the NW/4 and the NE/4 of the NE/4 of the NW/4 of Section 31, Township 15 North, Range 8 East, Creek County, Oklahoma.

2. That the Commission has jurisdiction over the subject matter hereto; that notice has been given in all respects as required by law and the rules of the Commission and no protests have been entered to the granting of the application.

3. That the applicant is the owner and operator of oil and gas leases on the above described land on which there are seven wells completed in the Penn Sand at the approximate depth of 2,430 feet and said wells are producing approximately one barrel of oil per well per day.

4. That the applicant believes there are commercial quantities of oil in said formation underlying said land that can be recovered by operating a waterflood therein that would otherwise be lost; that all wells are cased through the sand and cemented.

5. That in the interest of securing the greatest ultimate recovery of oil from the pool, the prevention of waste and the protection of correlative rights, this application should be granted.

ORDER

IT IS THEREFORE ORDERED by the Corporation Commission of Oklahoma that Great Plains Petroleum Corporation be and it is hereby permitted and authorized to operate a waterflood in the Penn Sand underlying Lots 1 and 2 (being the W/2 of the NW/4) and the NE/4 of the NW/4 and the S/2 of the NE/4 of the NW/4 and the NE/4 of the NE/4 of the NW/4 of Section 31, Township 15 North, Range 8 East, Creek County, Oklahoma.

IT IS FURTHER ORDERED that the daily production from this waterflood operation shall be limited to that amount of oil calculated by multiplying the number of oil-producing wells on the lease times the basic daily oil allowable fixed by the Commission for unrestricted wells in the area.

IT IS FURTHER ORDERED that this waterflood shall be operated in such a manner that no detriment or damage will be done to any oil, gas or fresh water bearing formation.

DONE AND PERFORMED this 31st day of July, 1959.

CORPORATION COMMISSION OF OKLAHOMA

Ray C. Jones, Chairman

Wilburn Cartwright, Vice-Chairman

ATTEST: Carl B. Mitchell, Secretary — Harold Freeman, Commissioner

In

BEFORE THE OIL CONSERVATION COMMISSION SANTA FE, NEW MEXICO EXHIBIT No. 16 CASE

W.N.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY

BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA

IN THE MATTER OF THE APPLICATION OF DOBBINS & BRANCH FOR AN ORDER PERMITTING THE INJECTION OF WATER FOR SECONDARY RECOVERY IN THE PENNSYLVANIAN SAND AND IN THE LOCO SAND OF THE SHALLOW LEASE COVERING THE W/2 SE/4 SW/4 AND SW/4 NW/4 AND W/2 NE/4 SW/4 AND SE/4 SW/4 SW/4 AND THE NW/4 SE/4 AND W/2 NE/4 SE/4 OF SECTION 15, TOWNSHIP 3 SOUTH, RANGE 3 WEST, STEPHENS COUNTY, OKLAHOMA.

CAUSE CD NO. 12,434

ORDER NO. 40419

REPORT OF THE COMMISSION

This cause came on for hearing before the Corporation Commission of Oklahoma on the 3rd day of September, 1959, at 10 o'clock a.m., in the Commission's Courtroom, Capitol Office Building, Oklahoma City, Oklahoma; the Honorable Ray C. Jones, Chairman, Wilburn Cartwright, Vice-Chairman, and Harold Freeman, Commissioner, sitting.

Geo. H. Ogg, Attorney, appeared for the applicant, Dobbins & Branch; Ferrell H. Rogers, Conservation Attorney, and Lester D. Hoyt, Assistant Conservation Attorney, appeared for the Commission.

The case was called and referred to W. H. Sellers, Trial Examiner, for the purpose of taking testimony and reporting to the Commission.

The Trial Examiner heard the cause and has filed his report recommending that the application be granted, which report and recommendation are hereby adopted and the Commission therefore finds as follows:

F I N D I N G S

1. That this is an application of Dobbins & Branch for permission and authority to operate a waterflood in the Pennsylvanian Sand and the Loco Sand underlying the W/2 SE/4 SW/4 and the SW/4 NW/4 and the W/2 NE/4 SW/4 and the SE/4 SW/4 SW/4 and the NW/4 SE/4 and the W/2 NE/4 SE/4 of Section 15, Township 3 South, Range 3 West, Stephens County, Oklahoma.

2. That the Commission has jurisdiction over the subject matter herein; that notice has been given in all respects as required by law and the rules of the Commission and no protests have been entered to the granting of the application.

3. That the applicant is the owner and operator of oil and gas leases on the above described land on which 3 wells have been completed in the Loco Sand found between the depths of 950 feet and 1020 feet which are now producing about 1 barrels each per day and 9 wells are completed in the Pennsylvanian Sand found between the depths of 2880 feet and 3001 feet and are producing about 1 barrel of oil each per day.

4. That the applicant believes there are substantial quantities of oil in said formation underlying said land that can be recovered by operating a waterflood therein that would otherwise be lost; that all wells are or will be cased to or through the sand and cemented to the surface.

5. That in the interest of securing the greatest ultimate recovery of oil from the pool, the prevention of waste and the protection of correlative rights, this application should be granted.

O R D E R

IT IS THEREFORE ORDERED by the Corporation Commission of Oklahoma that Dobbins & Branch be, and they are hereby permitted and authorized to operate a waterflood in the Pennsylvanian Sand and the Loco Sand underlying the W/2 SE/4 SW/4 and SW/4 NW/4 and the W/2 NE/4 SW/4 and SE/4 SW/4 SW/4 and NW/4 SE/4 and W/2 NE/4 SE/4 of Section 15, Township 3 South, Range 3 West, Stephens County, Oklahoma.

IT IS FURTHER ORDERED that the daily production from this waterflood operation shall be limited to that amount of oil calculated by multiplying the number of oil-producing wells on the lease times the basis daily oil allowable fixed by the Commission for unrestricted wells in the state.

IT IS FURTHER ORDERED that this waterflood shall be operated in such a manner that no detriment or damage will be done to any oil, gas or fresh water bearing formation.

DONE AND PERFORMED this 3rd day of September, 1959.

CORPORATION COMMISSION OF OKLAHOMA

Ray C. Jones, Chairman

Wilburn Cartwright, Vice-Chairman

Harold Freeman, Commissioner

ATTEST:

Secretary

wd

BEFORE THE OIL CONSERVATION COMMISSION SANTA FE, NEW MEXICO EXHIBIT No. 13 CASE

BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA

IN RE: APPLICATION OF PARAMORE OIL COMPANY, A PARTNERSHIP COMPOSED OF HENRY R. PARAMORE, PAUL PARAMORE, FRED PARAMORE AND DOROTHY A. HAMILTON FOR PERMISSION TO WATER FLOOD THE SHALLOW LOCO SANDS UNDERLYING THE SW/4, AND THE NW/4 SE/4 OF SECTION 16, TOWNSHIP 3 SOUTH, RANGE 3 WEST, STEPHENS COUNTY, OKLAHOMA.

CAUSE CD NO. 12,442

ORDER NO. 40421

REPORT OF THE COMMISSION

This cause came on for hearing before the Corporation Commission of Oklahoma on the 3rd day of September, 1959, at 10 o'clock a.m., in the Commission's Courtroom, Capitol Office Building, Oklahoma City, Oklahoma; the Honorable Ray C. Jones, Chairman, Wilburn Cartwright, Vice-Chairman, and Harold Freeman, Commissioner, sitting.

J. O. Cliff, Attorney, appeared for the applicant, Paramore Oil Company; Ferrell H. Rogers, Conservation Attorney, and Lester D. Hoyt, Assistant Conservation Attorney, appeared for the Commission.

The case was called and referred to W. H. Sellers, Trial Examiner, for the purpose of taking testimony and reporting to the Commission.

The Trial Examiner heard the cause and has filed his report recommending that the application be granted, which report and recommendation are hereby adopted and the Commission therefore finds as follows:

F I N D I N G S

1. That this is an application of Paramore Oil Company, a partnership composed of Henry R. Paramore, Paul Paramore, Fred Paramore and Dorothy A. Hamilton, for permission and authority to operate a waterflood in the Loco Sands underlying the SW/4 of the NW/4 and the NW/4 of the SW/4 of Section 16, Township 3 South, Range 3 West, Stephens County, Oklahoma.

2. That the Commission has jurisdiction over the subject matter herein; that notice has been given in all respects as required by law and the rules of the Commission and no protests have been entered to the granting of the application.

3. That the applicants are the owners and operators of oil and gas leases on the above described land on which 12 wells have heretofore been completed in the Loco Sands between the depths of 290 feet and 500 feet and are producing about 3/4ths barrel of oil per well per day.

4. That the applicant believes there are substantial quantities of oil in said formation underlying said land that can be recovered by operating a waterflood therein that would otherwise be lost; that all water injection wells will be cased to or through the sand and cemented to the surface and the producing wells will be cased to or through the sand and cemented.

5. That in the interest of securing the greatest ultimate recovery of oil from the pool, the prevention of waste and the protection of correlative rights, this application should be granted.

O R D E R

IT IS THEREFORE ORDERED by the Corporation Commission of Oklahoma that Paramore Oil Company, a partnership composed of Henry R. Paramore, Paul Paramore, Fred Paramore and Dorothy A. Hamilton, be, and it is hereby permitted and authorized to operate a waterflood in the Loco Sands underlying the SW/4 of the NW/4 and the NW/4 of the SW/4 of Section 16, Township 3 South, Range 3 West, Stephens County, Oklahoma.

IT IS FURTHER ORDERED that the daily production from this waterflood operation shall be limited to that amount of oil calculated by multiplying the number of oil-producing wells on the lease times the basis daily oil allowable fixed by the Commission for unrestricted wells in the state.

IT IS FURTHER ORDERED that this waterflood shall be operated in such a manner that no detriment or damage will be done to any oil, gas or fresh water bearing formation.

DONE AND PERFORMED this 3rd day of September, 1959.

CORPORATION COMMISSION OF OKLAHOMA

Ray C. Jones, Chairman

Wilburn Cartwright, Vice-Chairman

Harold Freeman, Commissioner

ATTEST:

Secretary

wd

BEFORE THE OIL CONSERVATION COMMISSION SANTA FE, NEW MEXICO EXHIBIT No. 14 CASE

W.N.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY

BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA

IN THE MATTER OF THE APPLICATION OF G. D. SPENDLIN TO CONDUCT WATERFLOOD OPERATIONS IN THE TONEY FORMATION IN A PORTION OF THE S/2 OF SECTION 31, TOWNSHIP 1 NORTH, RANGE 3 WEST, GARVIN COUNTY, OKLAHOMA.

CAUSE CD NO. 12,444

ORDER NO. 40423

REPORT OF THE COMMISSION

This cause came on for hearing before the Corporation Commission of Oklahoma on the 4th day of September, 1959, at 10 o'clock a. m., in the Commission's Courtroom, Capitol Office Building, Oklahoma City, Oklahoma; the Honorable Ray C. Jones, Chairman, Wilburn Cartwright, Vice-Chairman, and Harold Freeman, Commissioner, sitting.

G. D. Spendlin, Applicant, appeared in his own behalf; and Purcell H. Rogers, Conservation Attorney, and Lester D. Hoyt, Assistant Conservation Attorney, appeared for the Commission.

The case was called and referred to W. H. Sellers, Trial Examiner, for the purpose of taking testimony and reporting to the Commission.

The Trial Examiner heard the cause and has filed his report recommending that the application be granted, which report and recommendation are hereby adopted and the Commission therefore finds as follows:

FINDINGS

1. That this is an application of G. D. Spendlin for permission and authority to operate a waterflood in the Toney Sands underlying the NE/4 of the SE/4 and the E/2 of the SE/4 of the SW/4 of Section 31, Township 1 North, Range 3 West, Garvin County, Oklahoma.

2. That the Commission has jurisdiction over the subject matter hereto; that notice has been given in all respects as required by law and the rules of the Commission and no protests have been entered to the granting of the application.

3. That the applicant is the owner and operator of oil and gas leases on the above described land on which six wells have heretofore been completed within Toney Sands found between the depths of 3,160 feet and 3,700 feet, and said wells have now declined in production until the applicant believes that it is time to begin the operation of secondary recovery.

4. That the applicant believes there are substantial quantities of oil in said formation underlying said land that can be recovered by operating a waterflood therein that would otherwise be lost; that the applicant desires to operate said waterflood by injecting water into said formation through the Jones No. 1 Well located in the NE/4 of the SW/4 of the NE/4 of said Section 31; that said well has been completed by being cased with 80 feet of 10-3/4 inch casing cemented to the surface and 3,319 feet of 7" inch casing cemented with 250 sacks of cement; that all of the oil-producing wells are completed in a similar manner.

5. That in the interest of securing the greatest ultimate recovery of oil from the pool, the prevention of waste and the protection of correlative rights, this application should be granted.

ORDER

IT IS THEREFORE ORDERED by the Corporation Commission of Oklahoma that G. D. Spendlin be and he is hereby permitted and authorized to operate a waterflood in the Toney Sands found between the depths of 3,160 feet and 3,700 feet underlying the NE/4 of the SE/4 and the E/2 of the SE/4 of the SW/4 of Section 31, Township 1 North, Range 3 West, Garvin County, Oklahoma, by injecting water into said formation through the Jones No. 1 Well located in the NE/4 of the SW/4 of the SE/4 of said Section 31.

IT IS FURTHER ORDERED that the daily production from this waterflood operation shall be limited to that amount of oil calculated by multiplying the number of oil-producing wells on the lease times the basic daily oil allowable fixed by the Commission for unallocated wells in the state.

IT IS FURTHER ORDERED that this waterflood shall be operated in such a manner that no detriment or damage will be done to any oil, gas or fresh water bearing formation.

DONE AND PERFORMED this 4th day of September, 1959.

CORPORATION COMMISSION OF OKLAHOMA

Ray C. Jones, Chairman

Wilburn Cartwright, Vice-Chairman

Harold Freeman, Commissioner

ATTEST:

Carl B. Mitchell
Secretary

ln

BEFORE THE OIL CONSERVATION COMMISSION SANTA FE, NEW MEXICO
EXHIBIT No. 6-G
CASE

BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA

IN THE MATTER OF THE APPLICATION OF ELIAS DRUMMER FOR AUTHORITY TO PRODUCTE WATER FLOOD OPERATIONS IN THE E/2 OF NW/4 OF SECTION 15, TOWNSHIP 26 NORTH, RANGE 13 EAST, WASHINGTON COUNTY, OKLAHOMA AND IN THE NW/4 OF NW/4 OF SECTION 21, TOWNSHIP 26 NORTH, RANGE 16 EAST, NOWATA COUNTY, OKLAHOMA.

CAUSE CD NO. 12,462

ORDER NO. 40425

REPORT OF THE COMMISSION

This cause came on for hearing before the Corporation Commission of Oklahoma on the 9th day of September, 1959, at 10 o'clock a.m., in the Commission's Courtroom, Capitol Office Building, Oklahoma City, Oklahoma; the Honorable Ray C. Jones, Chairman, Wilburn Cartwright, Vice-Chairman, and Harold Freeman, Commissioner, sitting.

Allen M. Stocker, Attorney, appeared for the applicant, Elias Drummer; Purcell H. Rogers, Conservation Attorney, and Lester D. Hoyt, Assistant Conservation Attorney, appeared for the Commission.

The case was called and referred to W. H. Sellers, Trial Examiner, for the purpose of taking testimony and reporting to the Commission.

The Trial Examiner heard the cause and has filed his report recommending that the application be granted, which report and recommendation are hereby adopted and the Commission therefore finds as follows:

FINDINGS

1. That this is an application of Elias Drummer, for permission and authority to operate a waterflood in the Bartlesville Sand underlying the E/2 of the NW/4 of Section 15, Township 26 North, Range 13 East, Washington County, Oklahoma, and the NW/4 of the NW/4 of Section 21, Township 26 North, Range 16 East, Nowata County, Oklahoma.

2. That the Commission has jurisdiction over the subject matter hereto; that notice has been given in all respects as required by law and the rules of the Commission and no protests have been entered to the granting of the application.

3. That the applicant is the owner and operator of oil and gas leases on the above described land which have been heretofore developed in the Bartlesville Sand which is found at the approximate depth of 1340 feet in said Section 15, and 340 feet in said Section 21 and said wells have been produced to depletion and abandoned.

4. That the applicant believes there are substantial quantities of oil in said formation underlying said land that can be recovered by operating a waterflood therein that would otherwise be lost; that all injection wells will be cased to the sand and cemented to the surface and the producing wells will be cased to the top of the sand and cemented with approximately 50 sacks of cement and will have sufficient casing set and cemented to the surface sufficient to protect all fresh water.

5. That in the interest of securing the greatest ultimate recovery of oil from the pool, the prevention of waste and the protection of correlative rights, this application should be granted.

ORDER

IT IS THEREFORE ORDERED by the Corporation Commission of Oklahoma that Elias Drummer be and he is hereby, permitted and authorized to operate a waterflood in the Bartlesville Sand underlying the E/2 of the NW/4 of Section 15, Township 26 North, Range 13 East, Washington County, Oklahoma, and the NW/4 of the NW/4 of Section 21, Township 26 North, Range 16 East, Nowata County, Oklahoma.

IT IS FURTHER ORDERED that the daily production from this waterflood operation shall be limited to that amount of oil calculated by multiplying the number of oil-producing wells on the lease times the basic daily oil allowable fixed by the Commission for unallocated wells in the state.

IT IS FURTHER ORDERED that this waterflood shall be operated in such a manner that no detriment or damage will be done to any oil, gas or fresh water bearing formation.

DONE AND PERFORMED this 9th day of September, 1959.

CORPORATION COMMISSION OF OKLAHOMA

Ray C. Jones, Chairman

Wilburn Cartwright, Vice-Chairman

Harold Freeman, Commissioner

ATTEST:

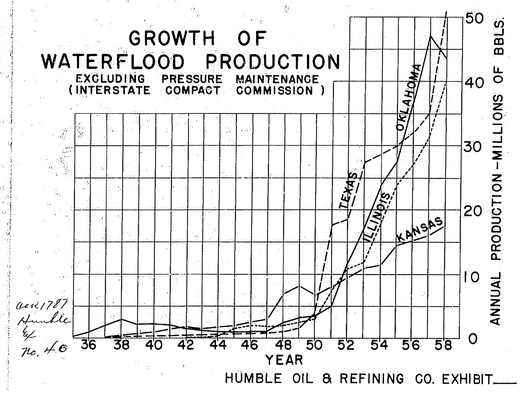
Carl B. Mitchell
Secretary

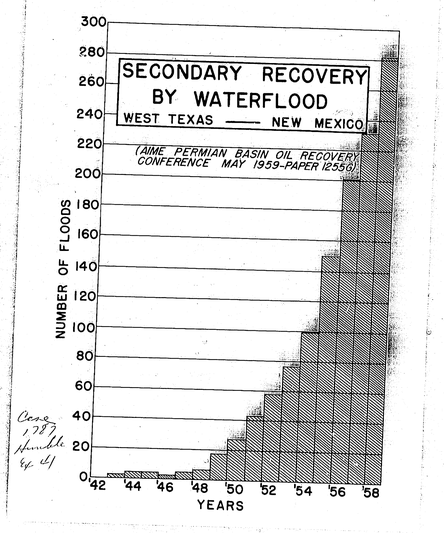
wd

BEFORE THE OIL CONSERVATION COMMISSION SANTA FE, NEW MEXICO
EXHIBIT No. 6-I
CASE

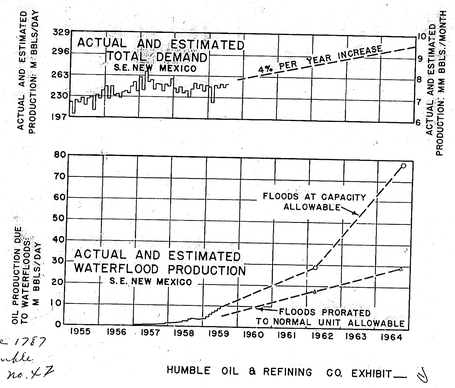
W.N.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY

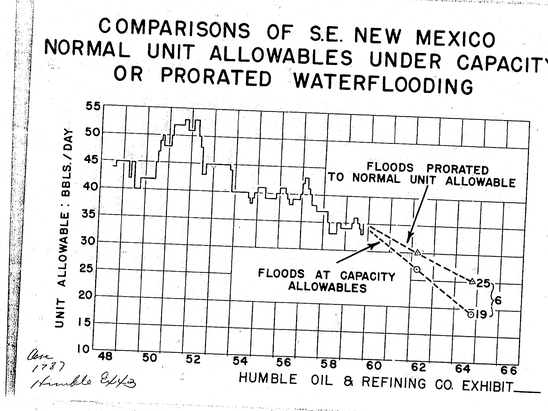




W.N.M.C.F. MICROGRAPHICS
BEST AVAILABLE COPY



Case 1787
Humble
Ex no. 47



Case 1787
Humble Ex #3

N.M.O.C.D. MICROGRAPHICS
BEST AVAILABLE COPY

CONCLUSIONS

1. FUTURE WATERFLOODING IN NEW MEXICO

   Prospects Bright.

2. RISK IN WATERFLOODING

   Less Than Industry Drilling Experiences.

3. WATERFLOODING INVESTMENT

   Less Than General Industry Requirements.

4. PROFIT IN WATERFLOODING

   Under Regulated Allowables, Profitability Several Fold Greater Than For Primary Drilling.

5. WATERFLOOD OIL EFFECT ON ALLOWABLES 5 YEARS HENCE

   6 Bbl. Estimated Difference In Southeast New Mexico Normal Unit Allowable Depending On Whether Flood Oil Production Prorated Or Allowed At Capacity.

6. PRORATION OF WATERFLOOD ALLOWABLES

   Is Sound Conservation Practice
   Permits Attractive Profit
   Places Flood Oil In Uniform Market Position
   Prevents Preferential Treatment To Waterflood Operation.

7. HOW DO WE SPLIT THE PUT?

   Same Consistent General Bases Of Proration & Assignment Of Allowables For Primary, Secondary, Pressure Maintenance Production. Limited Exceptions To Initial Pilot Operations.

Case 1787
Humble Ex 44

HUMBLE OIL & REFINING COMPANY EXHIBIT _____

HUMBLE OIL & REFINING COMPANY
RULE 701 (PROPOSED)

A. Permit for Injection Required

The injection of gas, liquefied petroleum gas, air, water, or any other medium into any reservoir for the purpose of maintaining reservoir pressure or for the purpose of secondary recovery or the injection of water into any formation for the purpose of water disposal shall be permitted only by order of the Commission after notice and hearing, unless otherwise provided herein or unless previously provided for in special rules governing a specific pool.

B. Method of Making Application

Application for hearing to obtain authority for the injection of gas, liquefied petroleum gas, air, water, or any other medium into any formation for any reason shall include the following:

1. A plat showing the location of the proposed injection (well(s) and the location of all other wells within a radius of two miles of said proposed injection well(s), and the formation from which said wells are producing or have produced. The plat shall also indicate the lessees, if any there be, within said two-mile radius.
2. A log of the proposed injection well(s) if same is available.
3. A description of the proposed injection well(s) casing program.
4. Such other pertinent information as the name and depth of the zone or formation into which injection will be made, the kind of fluid to be injected, the anticipated amounts to be injected, and the source of said injection fluid.

Case 1787
Humble Ex 45

W.N.M.C.P. MICROGRAPHICS

BEST AVAILABLE COPY

C. Salt Water Disposal Wells (Copy of Rule 701-C now in effect)

The Secretary-Director of the Oil Conservation Commission shall have authority to grant an exception to the requirements of Rule 701 (a) above for water disposal wells only, without notice and hearing when the waters to be disposed of are mineralized to such a degree as to be unfit for domestic, stock, irrigation, and/or other general use, and when said waters are to be disposed of into a formation of greater than Triassic age (Lea County only) which is non-productive of oil and/or gas within a radius of two miles from the proposed injection well, providing that any water occurring naturally within said disposal formation is mineralized to such a degree as to be unfit for domestic, stock, irrigation and/or other general use.

To obtain such administrative approval, operator shall submit in triplicate to the Commission at Santa Fe Commission form entitled, "Application to Dispose of Salt Water by Injection Into a Porous Formation Not Productive of Oil or Gas," together with evidence that a copy of said application was sent to the State Engineer's Office, Box 1079, Santa Fe, New Mexico, as well as to all offset operators and the surface owner of the land upon which the well is located.

If no objection is received within 15 days from the date of receipt of the application, the Secretary-Director is satisfied that all of the requirements above have been complied with and that the well is to be cased and cemented in such a manner that there will be no danger to oil, gas, or fresh water reservoirs, an administrative order approving the disposal well may be issued. In the event that the application is not granted administratively, it shall be set for public hearing.

The Commission may dispense with the 15-day waiting period if waivers of objection are received from all offset operators and the surface owner, and no objection is made by the State Engineering Office.

D. Project Area Defined

The project area shall comprise the proration units upon which injection wells are located plus all contiguous proration units which are substantially or totally enclosed by injection wells and which have producing wells completed on them.

In the following cases, the project area shall be limited to a reasonable number of proration units as determined by the Oil Conservation Commission on the basis of evidence submitted at hearing before the Commission:

1. Peripheral injection projects where certain proration units with producing wells on them may be substantially or totally enclosed by injection wells but are not contiguous with the tracts on which the injection wells are located.
2. Projects of the line-drive type where the injection wells do not enclose contiguous proration units which have producing wells completed on them.
3. Projects having injection patterns not covered by the above definitions.

E. Injection projects shall be expanded and additional wells placed on injection only upon authority from the Commission after notice and hearing or by administrative procedure in accordance with the following:

In order for a well to be added to a project by administrative approval for conversion to injection, it must be established to the satisfaction of the Secretary-Director of the Commission, that the proposed injection well is located on an injection pattern which will result in a thorough and efficient sweep of oil by the injected fluid in the project area being enlarged and also in conformance with the pattern used in other project areas in the pool.

W.N.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY

To obtain administrative approval for the conversion of any well to injection, applicant shall submit to the Commission in triplicate a request for such administrative approval, setting forth therein all the facts pertinent to the need for conversion of additional wells to injection, and attaching thereto Commission Form C-116, showing production tests of the affected well or wells both before and after stimulated by the flood. Applicant shall also attach plats of the project area and immediate surrounding area, indicating thereon the owner of each lease and the location of all injection wells and producing wells, and shall submit evidence that a copy of the application to convert additional wells to injection has been sent to each operator offsetting the proposed injection well and to the State Engineer.

The Secretary-Director may, if in his opinion there is need for conversion of additional wells to injection, authorize such conversion without notice and hearing, provided that no offset operator nor the State Engineer objects to the proposed conversion within fifteen (15) days. The Secretary-Director may grant immediate approval of the proposed conversion upon receipt of waivers of objection from all operators offsetting the proposed injection well and from the State Engineer.

F. Project Allowable

The allowable assigned to projects designed for the purpose of secondary recovery or for the purpose of pressure maintenance in reservoirs shall be determined as follows:

1. The initial project allowable prior to the demonstration of any effect from injection shall be the sum of the current allowables of wells in the project area, as defined in 701.D and 701.E above, including allowables from wells placed on injection. Such allowables from injection wells may be

transferred to any well or wells in the project area capable of producing the additional allowable.

2. Upon demonstration of the effect of injection through evidence submitted to the Secretary-Director, the project allowable may be assigned equal to producing capacity as it increases but the allowable shall be limited to a maximum allowable equal to the number of proration units in the project area times the Normal Unit Allowable times the proportional factor for the pool.

3. The project area allowable may be produced from any well or wells in the project area in any proportion but shall not exceed the maximum set out in 701.F.2 above with the following exception:

   In order to permit rapid evaluation of the effectiveness of injection and the feasibility of entering into a secondary recovery or pressure maintenance project, the initial pilot project in any pool may be granted a temporary allowable in excess of the number of proration units in the project area times the Normal Unit Allowable times the proportional factor for the pool for only such a period of time as is deemed necessary by the Oil Conservation Commission to permit adequate evaluation of the project.

W.N.M.C.P. MICROGRAPHICS

BEST AVAILABLE COPY

No definition of water flood or pressure maintenance project

NMOCC FLOOD ALLOWABLE PROPOSAL
40-ACRE WELL SPACING
5-SPOT FLOOD
S.E. NEW MEXICO



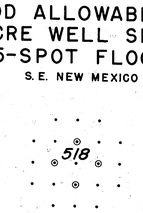
21 WELLS X 40 AC/WELL = 840 ACRES.
21 WELLS X 42 BBLS./WELL = 882 BBL. ALLOWABLE.
ALLOWABLE PER PROJECT ACRE = 1.05 BBLS.

Case 1787
Humble Ex. #6

HUMBLE OIL & REFINING CO. EXHIBIT__

N.M.M.C.F. MICROGRAPHICS
BEST AVAILABLE COPY

NMOCC FLOOD ALLOWABLE PROPOSAL
10-ACRE WELL SPACING
5-SPOT FLOOD
S.E. NEW MEXICO

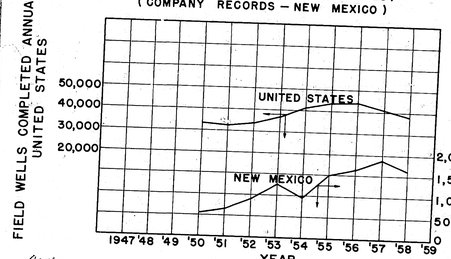


21 WELLS X 10 AC/WELL = 210 ACRES
8 WELLS X 42 BBLS/WELL = 336 BBLS.
13 WELLS X 14 BBLS/WELL = 182 BBLS.
518 BBL. ALLOWABLE.
ALLOWABLE PER PROJECT ACRE = 2.47 BBLS.

Case 1787
Humble Ex 47

HUMBLE OIL & REFINING CO. EXHIBIT___

ANNUAL FIELD WELL DRILLING
UNITED STATES
NEW MEXICO
(OIL & GAS JOURNAL – UNITED STATES)
(COMPANY RECORDS – NEW MEXICO)



Case 1787
Humble Ex 48

HUMBLE OIL & REFINING CO. EXHIBIT___

N.M.M.C.F. MICROGRAPHICS
BEST AVAILABLE COPY

BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA

41

IN THE MATTER OF THE APPLICATION OF MODEL AND GUSSMAN FOR PERMISSION TO WATERFLOOD THE MISSISSIPPI CHAT FORMATION UNDERLYING THE SOUTHEAST QUARTER (SE/4) OF SECTION 19, TOWNSHIP 23N, RANGE 9E, OSAGE COUNTY, OKLAHOMA.

CAUSE CD NO. 12,236

ORDER NO. 40099

REPORT OF THE COMMISSION

This cause came on for hearing before the Corporation Commission of Oklahoma on the 15th day of June, 1939, at 10 o'clock a. m., in the Commission's Courtroom, Capitol Office Building, Oklahoma City, Oklahoma; the Honorable Ray C. Jones, Chairman, Wilburn Cartwright, Vice-Chairman, and Harold Freeman, Commissioner, sitting.

Jack Campbell, Attorney, appeared for the applicant, Model and Gussman; and Purcell H. Rogers, Conservation Attorney, and Lester D. Hyl, Assistant Conservation Attorney, appeared for the Commission.

The cause was called and referred to W. H. Sellers, Trial Examiner, for the purpose of taking testimony and reporting to the Commission.

The Trial Examiner heard the cause and has filed his report recommending that the application be granted, which report and recommendation are hereby adopted and the Commission therefore finds as follows:

FINDINGS

1. That this is an application of Model and Gussman for permission and authority to operate a waterflood in the Mississippi Chat underlying the SE/4 of Section 19, Township 23 North, Range 9 East, Osage County, Oklahoma.

2. That the Commission has jurisdiction over the subject matter hereby that notice has been given in all respects as required by law and the rules of the Commission and no protests have been entered to the granting of the application.

3. That the applicant is the owner and operator of an oil and gas lease on the above described land on which 10 wells have heretofore been completed in the Mississippi Chat found at the approximate depth of 2,275 feet and five of these wells are producing an average of approximately 8 barrels of oil per day.

4. That the applicant believes there are substantial quantities of oil in said formation underlying said land that can be recovered by operating a waterflood therein that would otherwise be lost; that all wells are or will be owned into the sand and connected.

5. That it is possible that some restriction will have to be made on the amount of oil that can be produced from waterflood projects in this state, and the operator of this waterflood should take notice of this condition at this time, and conduct the operation of this waterflood in such a manner that compliance can be made with any order of the Commission placing a restriction on the amount of oil that can be produced from this waterflood project.

6. That in the interest of securing the greatest ultimate recovery of oil from the pool, the prevention of waste and the protection of correlative rights, this application should be granted.

ORDER

IT IS THEREFORE ORDERED by the Corporation Commission of Oklahoma that Model and Gussman be and it is hereby permitted and authorized to operate a waterflood in the Mississippi Chat underlying the SE/4 of Section 19, Township 23 North, Range 9 East, Osage County, Oklahoma.

IT IS FURTHER ORDERED that this waterflood shall be operated in such a manner that no detriment or damage will be done to any oil, gas or fresh water bearing formation.

DONE AND PERFORMED this 15th day of June, 1939.

CORPORATION COMMISSION OF OKLAHOMA

Ray C. Jones, Chairman

Wilburn Cartwright, Vice-Chairman

ATTEST:

Harold Freeman, Commissioner

Carl B. Mitchell
Secretary

In

BEFORE THE OIL CONSERVATION COMMISSION SANTA FE, NEW MEXICO
CASE _____ EXHIBIT No. 49

BEFORE THE OIL CONSERVATION COMMISSION SANTA FE, NEW MEXICO
CASE _____ EXHIBIT No. _____

BEFORE THE CORPORATION COMMISSION OF THE STATE OF OKLAHOMA

IN THE MATTER OF THE APPLICATION OF UNITED PRODUCING COMPANY, INC., FOR PERMISSION TO INSTITUTE A WATER FLOOD SECONDARY RECOVERY PROGRAM IN THE NEWS SAND UNDERLYING LOTS 2, 3, 4 AND 5, LYING SOUTH OF THE CIMARRON RIVER IN SECTION 12, TOWNSHIP 18 NORTH, RANGE 4 EAST) AND THE SW/4 OF SECTION 7, TOWNSHIP 18 NORTH, RANGE 5 EAST, PAYNE COUNTY, OKLAHOMA.

CAUSE CD NO. 12,158

ORDER NO. 40100

REPORT OF THE COMMISSION

This cause came on for hearing before the Corporation Commission of Oklahoma on the 15th day of June, 1939, at 10 o'clock a. m., in the Commission's Courtroom, Capitol Office Building, Oklahoma City, Oklahoma; the Honorable Ray C. Jones, Chairman, Wilburn Cartwright, Vice-Chairman, and Harold Freeman, Commissioner, sitting.

Geo. Dayal, Attorney, appeared for the applicant, United Producing Company, Inc.; and Purcell H. Rogers, Conservation Attorney, and Lester D. Hyl, Assistant Conservation Attorney, appeared for the Commission.

The case was called and referred to W. H. Sellers, Trial Examiner, for the purpose of taking testimony and reporting to the Commission.

The Trial Examiner heard the cause and has filed his report recommending that the application be granted, which report and recommendation are hereby adopted and the Commission therefore finds as follows:

FINDINGS

1. That this is an application of United Producing Company, Inc., for permission and authority to operate a waterflood in the News Sand underlying Lots 2, 3, 4 and 5, lying North of the Cimarron River in Section 12, Township 18 North, Range 4 East, and the SW/4 of Section 7, Township 18 North, Range 5 East, Payne County, Oklahoma.

2. That the Commission has jurisdiction over the subject matter hereby that notice has been given in all respects as required by law and the rules of the Commission and no protests have been entered to the granting of the application.

3. That the applicant is the owner and operator of oil and gas leases on the above described land on which six wells are completed in the Pure Sand found at the approximate depth of 2,900 feet and are producing a total of approximately 15 barrels of oil per day.

4. That the applicant believes there are substantial quantities of oil in said formation underlying said land that can be recovered by operating a waterflood therein that would otherwise be lost; that all wells are or will be completed by setting casing into or through the sand and connecting the same.

5. That it is possible that some restriction will have to be made on the amount of oil that can be produced from waterflood projects in this state, and the operator of this waterflood should take notice of this condition at this time, and conduct the operation of this waterflood in such a manner that compliance can be made with any order of the Commission placing a restriction on the amount of oil that can be produced from this waterflood project.

6. That in the interest of securing the greatest ultimate recovery of oil from the pool, the prevention of waste and the protection of correlative rights, this application should be granted.

ORDER

IT IS THEREFORE ORDERED by the Corporation Commission of Oklahoma that United Producing Company, Inc., be and it is hereby permitted and authorized to operate a waterflood in the Pure Sand underlying Lots 2, 3, 4 and 5, lying North of the Cimarron River in Section 12, Township 18 North, Range 4 East, and the SW/4 of Section 7, Township 18 North, Range 5 East, Payne County, Oklahoma.

IT IS FURTHER ORDERED that this waterflood shall be operated in such a manner that no detriment or damage will be done to any oil, gas or fresh water bearing formation.

DONE AND PERFORMED this 15th day of June, 1939.

CORPORATION COMMISSION OF OKLAHOMA

Ray C. Jones, Chairman

Wilburn Cartwright, Vice-Chairman

ATTEST:

Harold Freeman, Commissioner

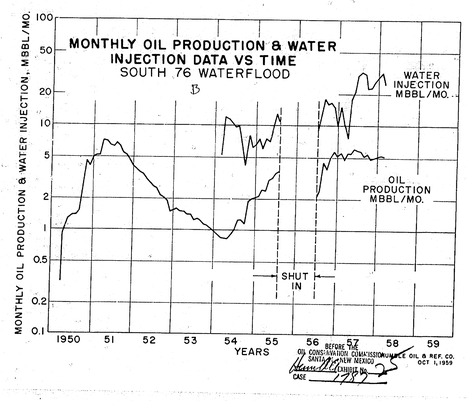
Carl B. Mitchell
Secretary

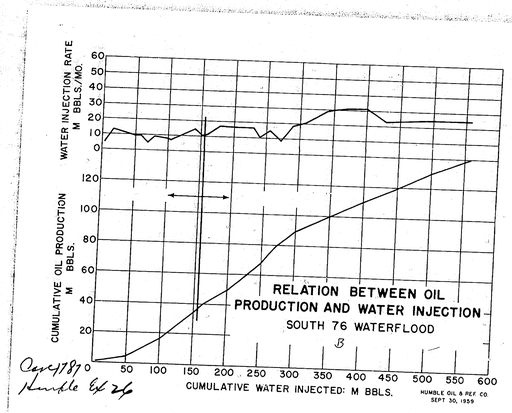
In

BEFORE THE OIL CONSERVATION COMMISSION SANTA FE, NEW MEXICO
CASE _____ EXHIBIT No. 50

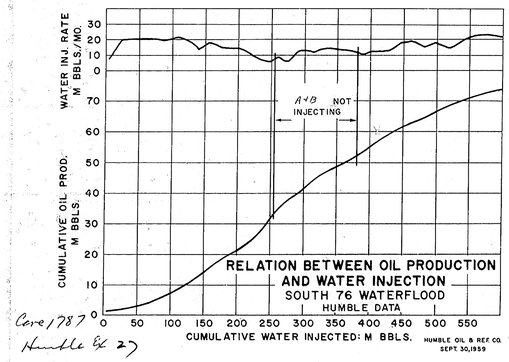
W.N.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY

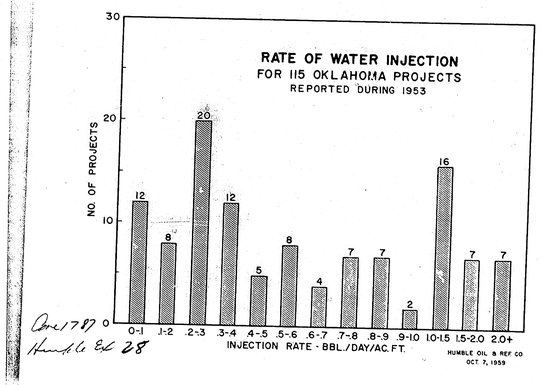




W.N.M.C.P. MICROGRAPHICS
BEST AVAILABLE COPY

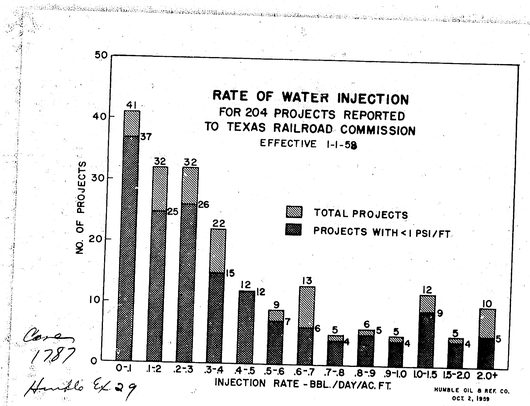


Core 1787
Humble Ex 27



Core 1787
Humble Ex 28

W.N.M.C.F. MICROGRAPHICS
BEST AVAILABLE COPY



Case 1787
Humble Ex 29

INJECTION RATES
SOUTHEAST NEW MEXICO

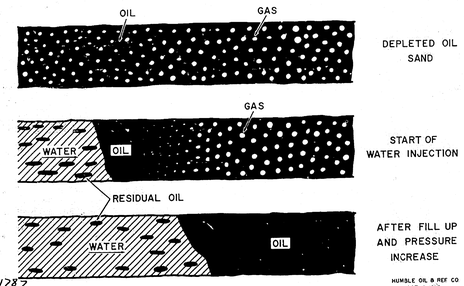
Pool	Injection Rate, B/D/Ac-Ft
Artesia	0.38
Caprock-Queen	
Craridge	0.39
Ambassador	0.47
Cities Service	0.52
Great Western	0.37
Corbin - Queen	0.20
Grayburg - Jackson	0.29
High Lonesome	0.05
Langlie-Mattix	0.21
Loco Hills	0.38
Maljamar	0.04
Red Lake - Grayburg	0.14
Russell - Yates	0.26
Shugart, No.	0.13
Square Lake	0.09
Vacuum	0.08

HUMBLE OIL & REFINING COMPANY EXHIBIT

Case 1787
Humble Ex 30

W.N.M.C.F. MICROGRAPHICS
BEST AVAILABLE COPY

WATER DISPLACEMENT IN AN OIL SAND CONTAINING GAS SATURATION



HUMBLE OIL & REF. CO.
OCT. 1, 1959

Case 1787
Humble Ex 31

LARGE PRESSURE MAINTENANCE PROJECTS

FIELD	WATER INJECTED BBL./D	INJECTION RATE BBL./D/AC.FT.	OIL PRODUCTION BBL./D
ADAIR WOLFCAMP	9900	.04	3092
COGDELL	43400	.03	13973
DIAMOND "M"			
LION UNIT	22200	.03	3826
SHARON RIDGE UNIT	40100	.03	12871
EAST TEXAS	473300	.11	130314
KELLY-SNYDER, SACROC UNIT	107000	.01	58353
SALT CREEK	13700	.01	9169
TODD, CRINOIDAL	2500	.01	1800

Case 1787
Humble Ex 32

HUMBLE OIL & REF. CO.
OCT. 1, 1959

U.N.M.C.F. MICROGRAPHICS
BEST AVAILABLE COPY

INDUSTRY EXPLORATORY DRILLING EXPERIENCE YEAR 1958

(FROM AAPG JUNE 1959 BULLETIN)

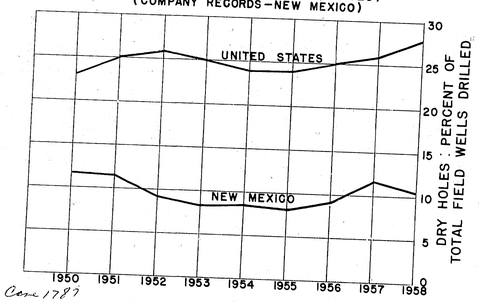
	TOTAL EXPLORATORY WELLS DRILLED	EXPLORATORY DRY HOLES	DRY EXPLORATORY HOLES PERCENT OF TOTAL
UNITED STATES	13,199	10,632	81
NEW MEXICO	325	235	72

Case 1787
Humble Ex. 33

HUMBLE OIL & REFINING CO. EXHIBIT___

INDUSTRY FIELD WELL EXPERIENCE

(OIL & GAS JOURNAL - UNITED STATES)
(COMPANY RECORDS - NEW MEXICO)



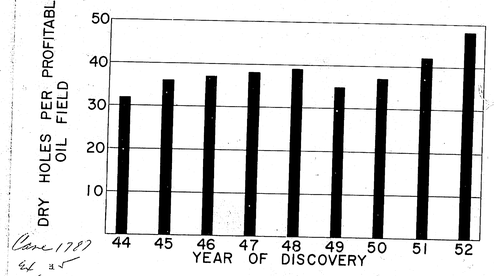
Case 1787
Humble Ex. 34

HUMBLE OIL & REFINING CO. EXHIBIT___

N.M.M.G.F. MICROGRAPHICS
BEST AVAILABLE COPY

DRY WILDCATS DRILLED FOR EACH PROFITABLE OIL FIELD DISCOVERY

(JUNE 1959 BULLETIN OF THE AAPG)

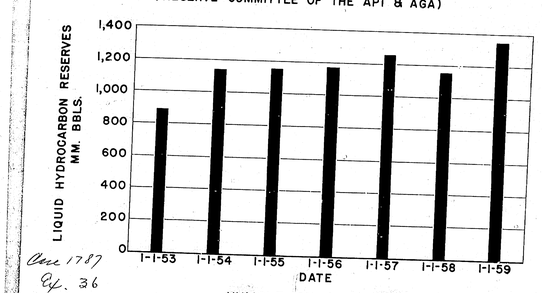


Case 1787
Ex. 35
Humble

HUMBLE OIL & REFINING CO EXHIBIT ___

PROVEN LIQUID HYDROCARBON RESERVES STATE OF NEW MEXICO

(RESERVE COMMITTEE OF THE API & AGA)



Case 1787
Ex. 36
Humble

HUMBLE OIL & REFINING CO. EXHIBIT ___

N.M.O.C.C. MICROGRAPHICS

BEST AVAILABLE COPY

CONVERSION COSTS TO CONDUCT PRESSURE MAINTENANCE AND SECONDARY RECOVERY PROJECTS

	YEAR INITIATED	NUMBER OF WELLS PRODUCING	NUMBER OF WELLS INJECTION	PROJECT ACREAGE	CONVERSION COSTS/ACRE
PRESSURE MAINTENANCE PROJECTS					
UNIT A	1955	305	39	14,760	122
UNIT B	1954	1188	66	49,706	127
UNIT C	1955	329	48	15,172	180
UNIT D	1956	58	6	2,844	140
FIVE-SPOT WATERFLOOD					
FLOOD A	1955	18	17	350	746
FLOOD B	1944	16	13	320	102
FLOOD C	1949	12	12	240	571
FLOOD D	Planning Stage	84	98	10,433	248
FLOOD E	Planning Stage	148	77	23,568	107
FLOOD F	1957	22	22	1760	400*

CONVERSION COSTS INCLUDE DEVELOPING SOURCE OF INJECTION WATER, INSTALLATION OF WATER INJECTION FACILITIES, AND PERFORMING NECESSARY WORKOVERS TO INITIATE THE PROJECT.

*DEVELOPMENT COST

HUMBLE OIL & REFINING CO. EXHIBIT 38

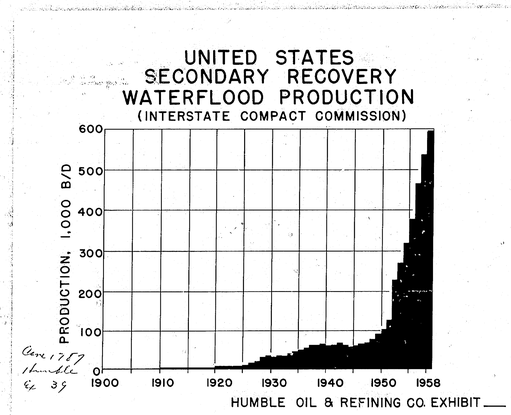
DEVELOPMENT COSTS FOR PRIMARY PRODUCTION TYPICAL NEW MEXICO FIELDS

	DEPTH	INVESTMENT FOR WELL DRILLING & LSE. FACILITIES $/ACRE
AREA A	3900	1038
AREA B	4200	1259
AREA C	6200	2238

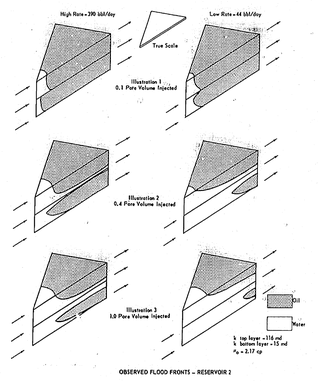
Case 1787
Humble
Ex 37

HUMBLE OIL & REFINING CO. EXHIBIT__

U.N.M.C.F. MICROGRAPHICS
BEST AVAILABLE COPY



Case 1757
Humble
Ex 39



OBSERVED FLOOD FRONTS – RESERVOIR 2

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT NO. 12
CASE

W.N.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY

BEFORE THE OIL CONSERVATION COMMISSION SANTA FE, NEW MEXICO EXHIBIT No. 13 CASE 1287

HUMBLE WATERFLOOD PROJECTS
INJECTION RATE DATA

DESIGNATION OF FLOOD	TYPE OF FLOOD	ACRES	INJECTION RATE, BPD	AVERAGE INJECTION RATE, BPD/AC-FT	DAILY OIL PROD., BBL
NOT PRORATED					
COLORADO, EXTENSION AREA FLOOD	PATTERN	627	3925	1.01	322
COLORADO, LINE DRIVE FLOOD	LINE DRIVE	450	2123	0.74	460
HOWARD GLASSCOCK, SETTLES LEASE	PATTERN	20	170	0.39	108
KERMIT, COLBY "A" LEASE	PATTERN	300	3061	0.17	253
KERMIT, COLBY "C" LEASE	PATTERN	180	2279	0.49	112
KERMIT, HOWE LEASE	PATTERN	240	2136	0.18	270
KERMIT, McCUTCHEN LEASE	PATTERN	100	1014	1.13	134
KERMIT, WALTON "D" LEASE	PATTERN	730	4136	0.20	360
NORTH WARD - ESTES, RICHTER LEASE	PATTERN	240	757	0.08	309
NORTH WARD - ESTES, STATE UNIV. "F"	PATTERN	350	3861	0.34	573
SOUTH SEVENTY SIX, W.F. OIL UNIT I	PATTERN	150	1340	1.79	42
SUBJECT TO PWT - EXEMPT FROM S-D					
COATES RANCH	PATTERN	220	400	0.25	100
SOUTH LIBERTY, BALDWIN	LINE DRIVE	70	70	0.04	85
THROCKMORTON COUNTY 1700-FEET	PERIPHERAL	90	500	0.23	52
SUBJECT TO PWT & S-D					
COLMENA, OCRC "L" LEASE	PATTERN	128	2083	1.35	276
CHARLOTTE PILOT	PATTERN	40	750	1.04	8
DORWARD, SAN ANGELO PILOT	PATTERN	40	1950	1.52	187
LOMA NOVIA, NORTH END	PATTERN	320	3448	0.69	490
RACOON BEND, GRAWUNDER	LINE DRIVE	755	3980	0.14	141
RACOON BEND, GUTOWSKI	LINE DRIVE	1050	2748	0.07	102

HUMBLE OIL & REF. CO. OCT. 1, 1955

Daily Average Prod.: bbl.

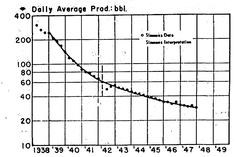


Fig. 1

Daily Average Prod.: bbl.

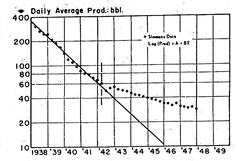


Fig. 2

Daily Average Prod.: bbl.

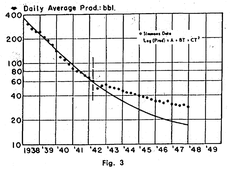


Fig. 3

BEFORE THE OIL CONSERVATION COMMISSION SANTA FE, NEW MEXICO EXHIBIT No. 14 CASE 1287

W.N.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY

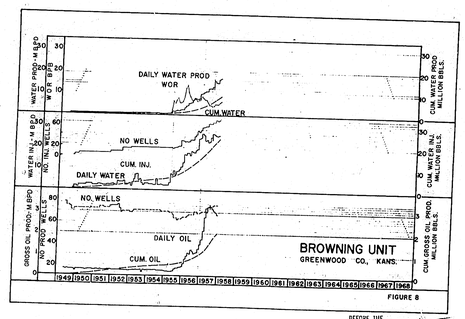


FIGURE 8

BEFORE THE
OIL CONSERVATION COMMISSION
CASE 1787 EXHIBIT No. 15

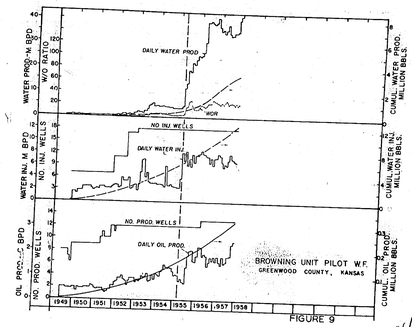
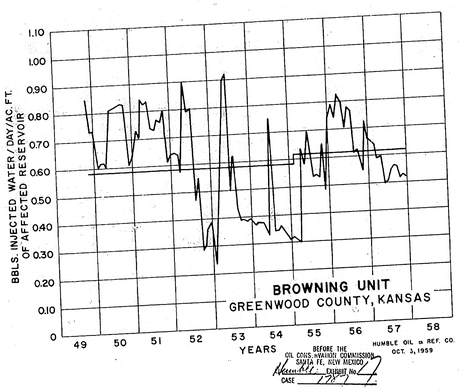


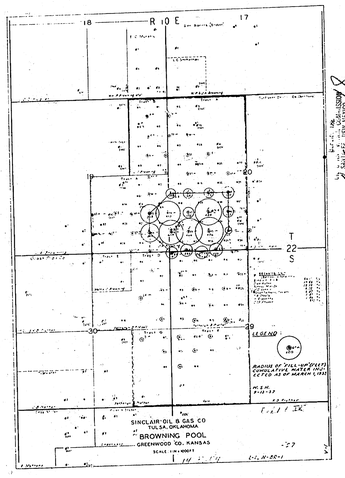
FIGURE 9

BEFORE THE
OIL CONSERVATION COMMISSION
CASE 1787 EXHIBIT No. 16

W.K.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY





N.M.O.C.C. MICROGRAPHICS
BEST AVAILABLE COPY

BROWNING UNIT

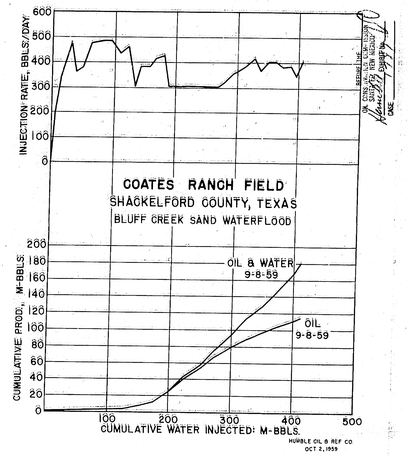
WATERFLOOD RECOVERY AS OF 1-1-58

PILOT AREA ..... 39.9 B/AC. FT.

OUTSIDE PILOT AREA ..... 31.9 B/AC. FT.

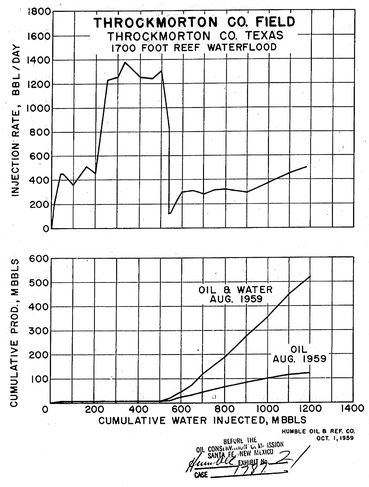
HUMBLE OIL & REF. CO.

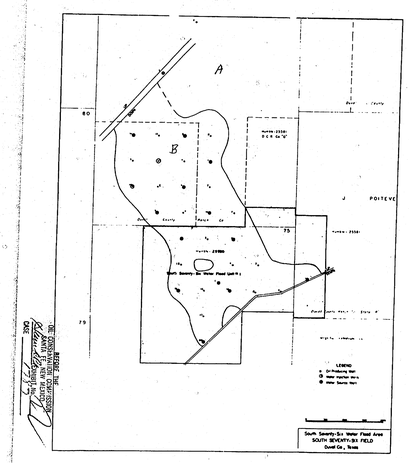
OCT. 2, 1959



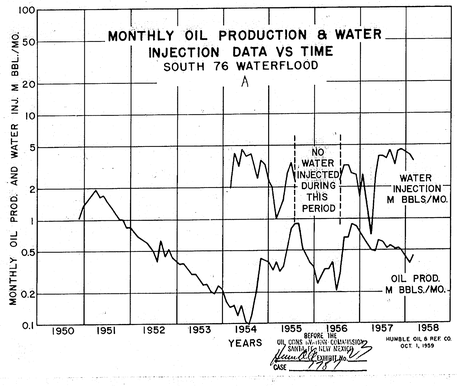
W.N.M.C.F. MICROGRAPHICS

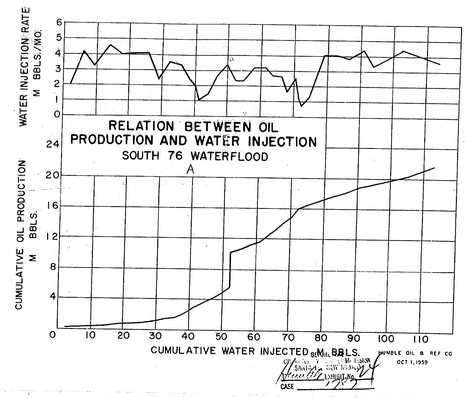
BEST AVAILABLE COPY





W.N.M.C.P. MICROGRAPHICS
BEST AVAILABLE COPY





W.N.M.C.P. MICROGRAPHICS
BEST AVAILABLE COPY

FORM 921-A-REVISED — THIS FORM CONFORMS TO API RP 33

RADIOACTIVITY LOG
WELEX JET SERVICES, Inc.

LICENSED BY: WELL SURVEYS, INC. — FILE NO.

Location of Well

COMPANY F. KIRK JOHNSON
WELL O. CLAPP # 3-A
FIELD KERMIT
COUNTY WINKLER STATE TEXAS
LOCATION 330' FSL & 100' FEL SE/4, SEC.
26 BLK. 26 PSL SURV. (70'W. OF PLUGGED & ABANDONED WELL #2)

COMPANY F. KIRK JOHNSON
WELL O. CLAPP # 3-A
FIELD KERMIT
COUNTY WINKLER STATE TEXAS
LOCATION 330' FSL & 100' FEL SE/4, SEC. 26 BLK. 26 PSL SURV. (70'W. OF PLUGGED & ABANDONED WELL #2)

LOG MEAS. FROM 9.70' ABV. BRADEN HD. ELEV. 2869.60
DRLG. MEAS. FROM SAME ELEV.
PERM. DATUM SAME ELEV.

	GAMMA RAY	NEUTRON
TYPE OF LOG		
RUN NO.	1	1
DATE	5-25-63	5-25-63
JOB NO.	WLS-478	WLS-481
TOTAL DEPTH (DRILLER)	3108	3108
EFFECTIVE DEPTH (DRILLER)	3108	3108
TOTAL DEPTH (R/A LOG)	3107	3107
TOP OF LOGGED INTERVAL	SURF.	SURF.
BOTTOM OF LOGGED INTERVAL	3095	3105
TYPE OF FLUID IN HOLE	SWC	SWC
FLUID LEVEL		
MAXIMUM RECORDED TEMPERATURE		
NEUTRON SOURCE STRENGTH & TYPE		500 M
SOURCE SPACING—IN.		3.75
LENGTH OF MEASURING DEVICE—IN.	30	9.5
O.D. OF INSTRUMENT—IN.	3-5/8	3-5/8
TIME CONSTANT—SECONDS	2.5	2.5
LOGGING SPEED FT./MIN.	20-40	20-40
STATISTICAL VARIATION—IN.		
SENSITIVITY REFERENCE	276	275
RECORDED BY	TAYLOR	
WITNESSED BY	REMARKS	

CASING RECORD

SIZE—IN.	WT.—LB.	INTERVAL	R/A DEPTH
8-5/8	24	SURF. TO 146	
5-1/2	14	SURF. TO 2736	2733
		TO	
		TO	
		TO	

OPEN HOLE RECORD

BIT SIZE—IN.	INTERVAL
11	SURF. TO 146
7-7/8	146 TO 2736
6-3/4	2736 TO 3108
	TO
	TO

REMARKS OR OTHER DATA

O.L. ELEV. 2861
R.B. TO O.L. 8.60

GAMMA RAY — RADIATION INTENSITY INCREASES

COUNTS PER MIN. DEPTH

NEUTRON — RADIATION INTENSITY INCREASES

6.2 | 0 | 2

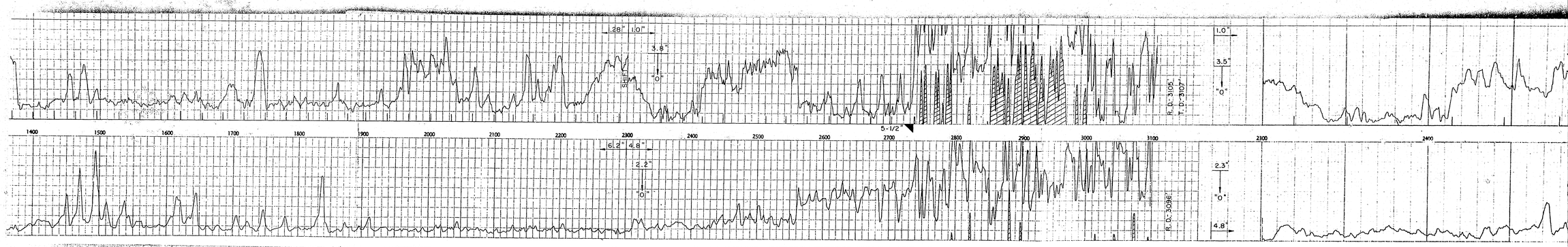
3.8 | 0 | 12.8

8-5/8"

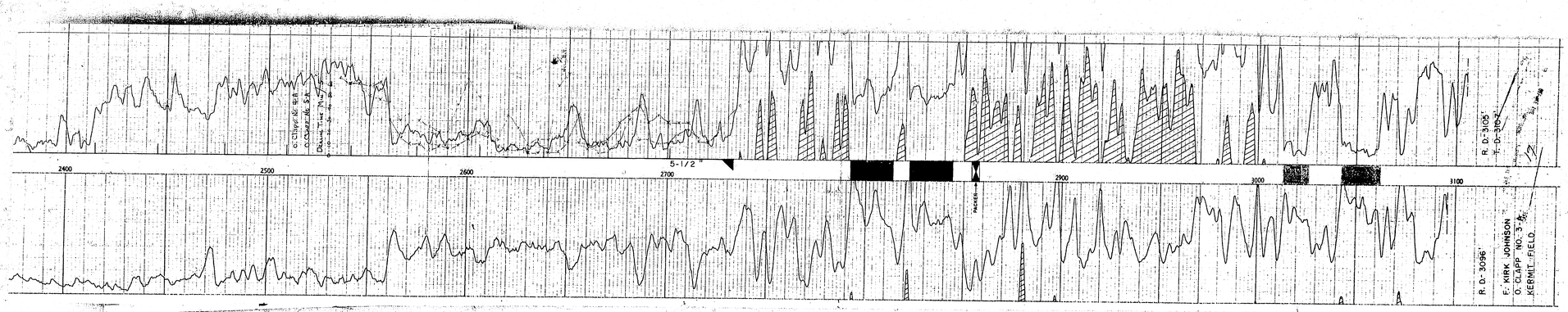
100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700

V.A.M.C.F. MICROGRAPHICS

LAID CENTRAL FILM



U.S.N.M.C.F. MICROGRAPHICS
BEST AVAILABLE COPY



W.N.M.C.P. MICROGRAPHICS

BEST AVAILABLE COPY

PROPOSED RULE

RULE 701. INJECTION OF FLUIDS INTO RESERVOIRS

A. Permit for Injection Required

The injection of gas, liquefied petroleum gas, air, water, or any other medium into any reservoir for the purpose of maintaining reservoir pressure or for the purpose of secondary recovery or the injection of water into any formation for the purpose of water disposal shall be permitted only by order of the Commission after notice and hearing, unless otherwise provided herein.

B. Method of Making Application

Application for hearing to obtain authority for the injection of gas, liquefied petroleum gas, air, water, or any other medium into any formation for any reason shall include the following:

1. A plat showing the location of the proposed injection well(s) and the location of all other wells within a radius of two miles of said proposed injection well(s), and the formation from which said wells are producing or have produced. The plat shall also indicate the lessees, if any there be, within said two-mile radius.
2. The log of the proposed injection well(s) if same is available.
3. A description of the proposed injection well(s) casing program.
4. Such other pertinent information as the name and depth of the zone or formation into which injection will be made, the kind of fluid to be injected, the anticipated amounts to be injected, and the source of said injection fluid.

W.N.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY

C. Salt Water Disposal Wells

(Rule 701(c) remains the same in its entirety.)

D. Pressure Maintenance Projects

1. Pressure maintenance projects are defined as those projects in which fluids are injected into the producing horizon in an effort to build-up and/or maintain the reservoir pressure in an area which has not reached the "stripper" state of depletion.

2. The project area and the allowable formula for pressure maintenance projects shall be fixed by the Commission on an individual basis after notice and hearing.

E. Water Flood Projects

1. Water flood projects are defined as those projects in which water is injected into a producing horizon in sufficient quantities and under sufficient pressure to stimulate the production of oil from other wells in the area, and shall be limited to those areas in which the wells have reached an advanced state of depletion and are regarded as what is commonly referred to as "stripper" wells.

2. The project area of a water flood project shall comprise the 40-acre tracts upon which injection wells are located plus all 40-acre tracts which directly or diagonally offset the injection tracts and have producing wells completed on them.

3. The maximum allowable assigned to any water flood project area shall be determined by multiplying the number of 40-acre tracts in the project area times the Area Allowable

U.N.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY

Factor times the 40-acre proportional factor for the pool. The allowable assigned to any water flood project area in which there are 40-acre tracts containing more than one well shall be increased by an amount of oil equal to 0.333 times the Area Allowable Factor for each such additional well on a 40-acre tract, provided however, that the additional allowable for any such 40-acre tract shall not exceed the Area Allowable Factor.

The project area allowable may be produced from any well or wells in the project area in any proportion.

Nothing herein contained shall be construed as prohibiting the assignment of special allowables to wells in buffer zones, after notice and hearing.

4. The Area Allowable Factor for the counties of Lea, Eddy, Chaves, and Roosevelt shall be 42. The Area Allowable Factor for the counties of San Juan, Rio Arriba, Sandoval, and McKinley shall be 52.

5. Water flood projects shall be expanded and additional wells placed on injection only upon authority from the Commission after notice and hearing or by administrative procedure in accordance with the following:
In order for a well in a water flood project to be eligible for administrative approval for conversion to water injection, it must be established to the satisfaction of the Secretary-Director of the Commission that the proposed water injection well has experienced a substantial response to water injection or is directly offset by a producing well which has experienced

W.R.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY

such response, and that the proposed injection well is located on a water injection pattern which will result in a thorough and efficient sweep of oil by the water flood.

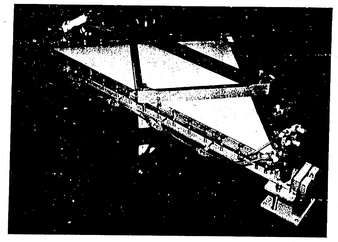
To obtain administrative approval for the conversion of any well to water injection, applicant shall submit to the Commission in triplicate a request for such administrative approval, setting forth therein all the facts pertinent to the need for conversion of additional wells to water injection, and attaching thereto Commission Form C-116, showing production tests of the affected well or wells both before and after stimulation by water flood. Applicant shall also attach plats of the water flood project area and immediate surrounding area, indicating thereon the owner of each lease and the location of all water injection wells and producing wells, and shall submit evidence that a copy of the application to convert additional wells to water injection has been sent to each operator offsetting the proposed injection well and to the State Engineer.

The Secretary-Director may, if in his opinion there is need for conversion of additional wells to water injection, authorize such conversion without notice and hearing, provided that no offset operator nor the State Engineer objects to the proposed conversion within fifteen (15) days. The Secretary-Director may grant immediate approval of the proposed conversion upon receipt of waivers of objection from all operators offsetting the proposed injection well and from the State Engineer.

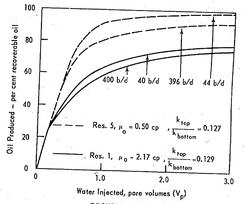
ir/

W.N.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY



STRATIFIED 5-SPOT MODEL



PROTOTYPE PERFORMANCE

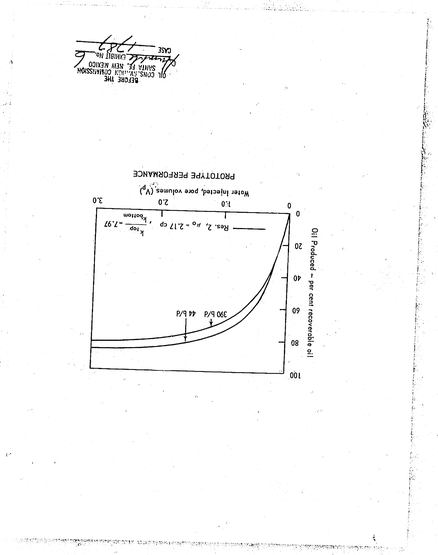
BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT No. 5
CASE 1287

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT No. 2
CASE 1287

W.N.M.C.P. MICROGRAPHICS

BEST AVAILABLE COPY

U.N.M.C.P. MICROGRAPHICS
BEST AVAILABLE COPY



BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
Exhibit No. 3
Case 1267

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
Exhibit No. 4
Case 1267

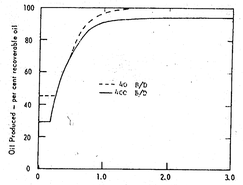


RELEASE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
DATE

PROTOTYPE PERFORMANCE
Water Injected, pore volumes (V_p)
Oil Produced - per cent recoverable oil
390 b/d
44 b/d
393 b/d
44 b/d
Run 2, μ_o = 2.17 cp, $\frac{k_{top}}{k_{bottom}}$ = 7.97
Run 6, μ_o = 0.50 cp, $\frac{k_{top}}{k_{bottom}}$ = 7.86

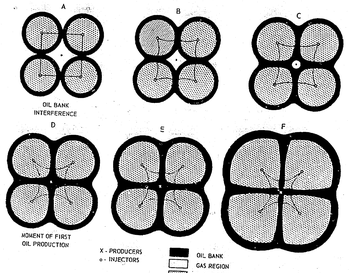
RELEASE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
DATE

PROTOTYPE PERFORMANCE
EFFECT OF CONTAMINANT
Water Injected, pore volumes (V_p)
Oil Produced - per cent recoverable oil
INJECTION RATE CHANGED
44 B/D) CONSTANT RATE
393 B/D) WATERFLOOD
393 B/D) CONTAMINATED WATER
44 B/D) WATERFLOOD
$\frac{k_{top}}{k_{bottom}}$ = 7.86



PROTOTYPE PERFORMANCE
WITH INITIAL GAS SATURATION

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
Humble EXHIBIT No. 9
CASE 1787



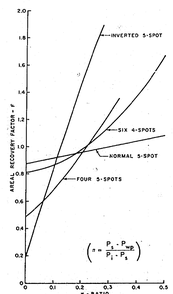
Fluid migration out of a five-spot in a pressure-depleted, dissolved gas drive reservoir.
(After Fitcher and Matthews)

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
Humble EXHIBIT No. 10
CASE 1787

W.N.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY

Case 1787
Humble Exhibit
Oct. 1959 Hearing



EFFECT OF OPERATING CONDITIONS ON AREAL RECOVERY FACTOR

(After Dalton, Rapoport, and Carpenter-AIME 10-59)

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT No. 11
CASE 1787

FIELD WATER-FLOOD PROPERTIES

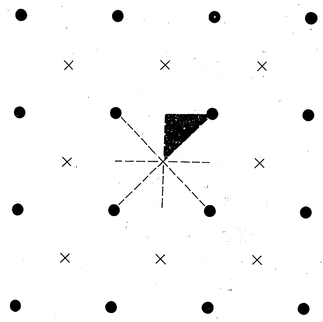
Characteristics	Range of Values (9 water floods)	Representative Water Flood
Water-Flood Pattern	5-spot	5-spot
Areal Extent, acres	20, 40, 80	20
Net Stratum Thickness, ft	4-30	10
Porosity, %	14-33	20
Absolute Permeability, md	16-339	16-116
Connate Water Saturation, %	20-50	30
Residual Oil Saturation, %	26-2	20
Water-Oil Density Difference, gm/cc	0.15-0.30	0.20
Water Viscosity, cp	0.48-0.95	0.50
Oil Viscosity, cp	0.46-10	0.50, 2.17
Interfacial Tension, dyne/cm	25-35	25

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT No. 1
CASE 1787

N.M.M.C.P. MICROGRAPHICS

BEST AVAILABLE COPY

TYPICAL 5 SPOT PATTERN

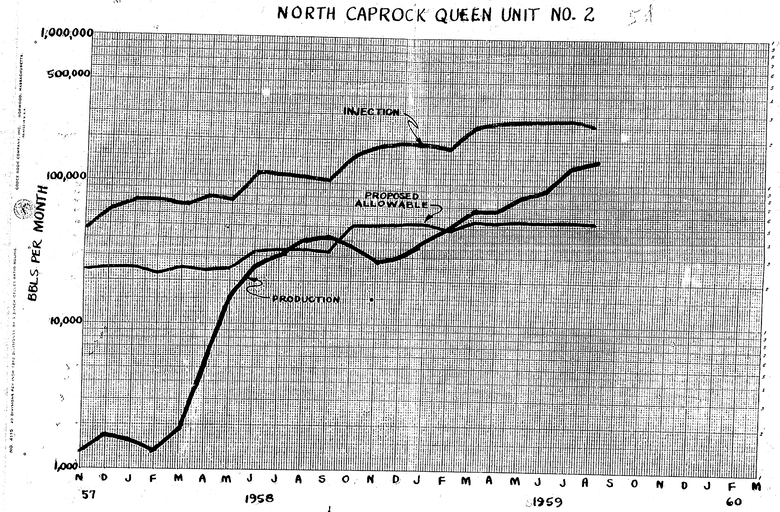


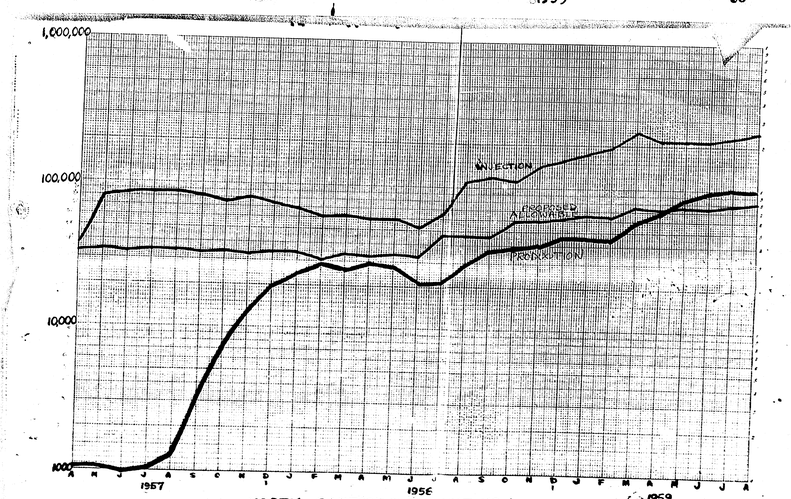
W.N.M.C.P. MICROGRAPHICS

BEST AVAILABLE COPY

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
Humble EXHIBIT No. 2
CASE 1287

NORTH CAPROCK QUEEN UNIT NO. 2





NORTH CAPROCK QUEEN UNIT NO. 1

U.S.N.C.F. MICROGRAPHICS
BEST AVAILABLE COPY

NEW MEXICO OIL CONSERVATION COMMISSION
PURCHASER'S NOMINATIONS FOR CRUDE OIL NOVEMBER, 1959

SOUTHEAST NEW MEXICO

Continental	12,000	
Famarins	10	
Atlantic	4,105	-615
Cactus	2,811	-1109
Cities Service	11,420	✓ 3
Gulf	22,000	
Magnolia	23,245	✓ 200
Phillips	965	
Shell	32,200	-2100
Indiana	40,000	
Sinclair	30,000	
Texaco	32,000	
Tidewater	3,500	
McWood	3,710	- 2
Permian	2,907	✓ 156
Graridge	282	- 3
High Lonesome	400	✓ 25
Western Development	685	✓ 80
Total Southeast New Mexico	222,240	-3365

NORTHWEST NEW MEXICO

El Paso	6,600	- 600
Shell	29,800	
Gulf	3,100	
Oriental	150	
Vanadium	25	- 3
Total Northwest New Mexico	39,675	- 603
TOTAL NEW MEXICO	261,915	-3968

ir/

RAILROAD COMMISSION OF TEXAS
OIL AND GAS DIVISION
AVERAGE CALENDAR DAY ALLOWABLE AS OF SEPTEMBER 26, 1959

(1)		(2)	(3)	(4)	(5)	(6)
DISTRICTS	WELLS	SCHEDULE DAILY ALLOW	EXEMPT ALLOW	SCHEDULE DAILY ALLOW SUBJECT TO SHUTDOWN DAYS	COLUMN #4 CONVERTED TO CALENDAR DAY BASIS	TOTAL AVER CALENDAR DAY ALLOW COL. 3 + 5
1	8,202	73,804	42,604	31,200	9,360	51,964
2	5,728	300,42	27,338	273,083	81,925	109,263
3	13,053	802,372	173,964	628,408	188,522	362,486
4	12,401	454,604	75,890	378,714	113,614	189,504
5	3,350	70,198	16,514	53,684	16,105	32,619
6*	5,285	289,302	42,571	246,731	74,019	116,590
6**	19,361	375,393	30,799	344,594	103,378	134,177
7-B	17,217	345,004	90,240	254,764	76,429	166,669
7-C	8,002	330,199	50,560	279,639	83,892	134,452
8	54,063	2,896,503	301,191	2,595,312	775,920	1,077,111
9	33,081	438,622	198,370	240,252	72,076	264,446
10	12,899	195,753	139,455	56,298	16,899	156,344
TOTAL:	192,642	6,566,175	1,183,496	5,382,679	1,612,129	2,795,625

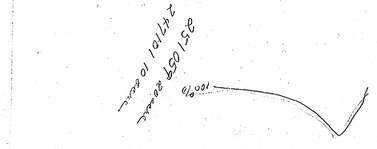
NOTE: 6* Denotes all of District 6 except the East Texas Field
6**Denotes the East Texas Field

TOTAL NUMBER OF WELLS AS OF SEPTEMBER 26, 1959 192,642
TOTAL NUMBER OF WELLS AS OF SEPTEMBER 19, 1959 191,838
INCREASE 804
TOTAL AVERAGE CALENDAR DAY ALLOWABLE AS OF SEPTEMBER 26, 1959 2,795,625
TOTAL AVERAGE CALENDAR DAY ALLOWABLE AS OF SEPTEMBER 19, 1959 2,779,346
INCREASE 16,279
TOTAL NUMBER OF FIELDS 6,688
TOTAL NUMBER OF FIELDS EXEMPT 410
SEPTEMBER 26, 1959
ob

not an exhibit (for info purposes)

W.N.M.C.F. MICROGRAPHICS
BEST AVAILABLE COPY


U.S.M.C.F. MICROGRAPHICS
BEST AVAILABLE COPY



NEW MEXICO OIL CONSERVATION COMMISSION
P. O. BOX 871
SANTA FE - NEW MEXICO

MEMORANDUM:

TO: ALL OPERATORS

FROM: A. L. PORTER, Jr., Secretary-Director

SUBJECT: PROPOSED WATER FLOOD RULES

Attached hereto is a proposed revision of Rule 701 of the Commission Rules and Regulations. This revision will be considered by the Commission at the October 14th hearing, Elks Club, Roswell, New Mexico.

You will note that this proposed Rule 701 is much more comprehensive than the presently existing Rule 701 and includes, among other things, provisions for administrative expansion of water floods and the assignment of project allowables to water flood projects.

It should be explained that the "Area Allowable Factor" for Southeast New Mexico is based upon the average normal unit allowable during the last ten years, and the Area Allowable Factor for Northwest New Mexico is based upon average allowables for that area since market outlets have been available.

It is proposed that these rules will apply only to new floods, not yet authorized by the Commission. Your suggestions as to the operation of buffer zones between new floods and old floods, as well as any other recommendations or proposed rules which you wish to submit, will be welcomed.

September 25, 1959

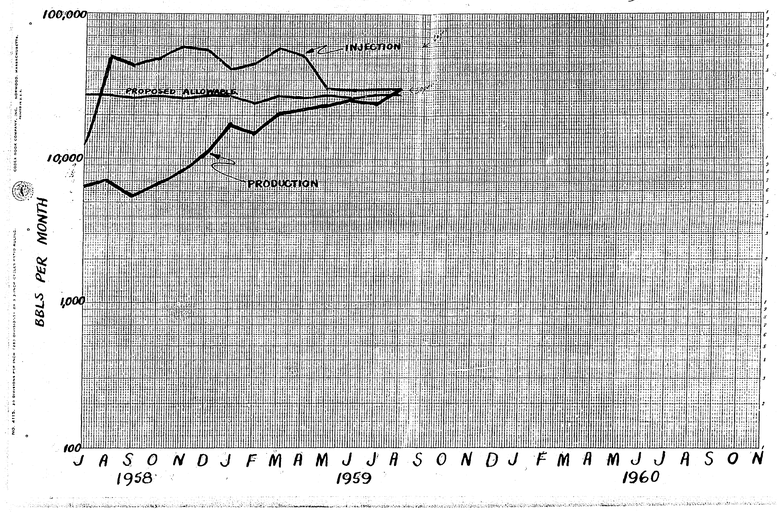
Enclosures: (2)

ir/

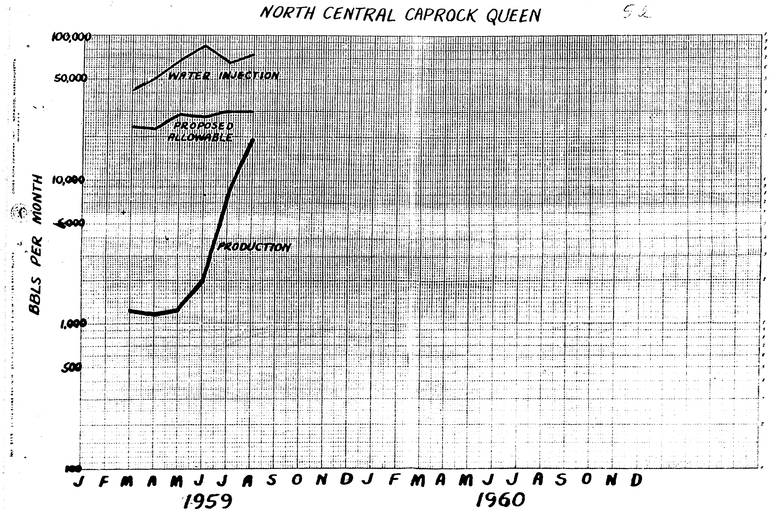
W.N.M.C.P. MICROGRAPHICS

BEST AVAILABLE COPY

DRICKEY-QUEEN UNIT AREA

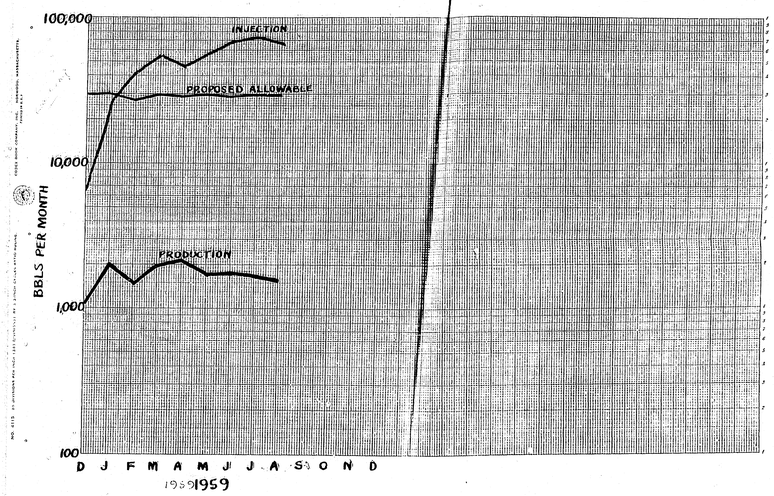


NORTH CENTRAL CAPROCK QUEEN

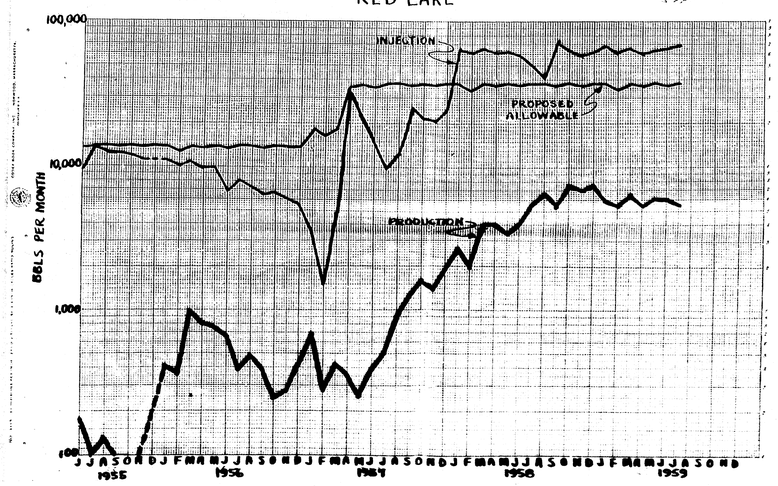


W.N.M.C.F. MICROGRAPHICS
BEST AVAILABLE COPY

VACUUM POOL



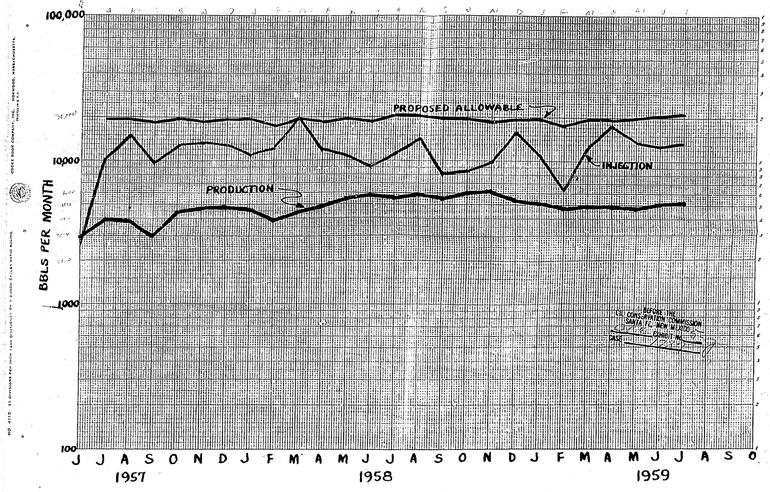
RED LAKE



U.N.M.C.F. MICROGRAPHICS
BEST AVAILABLE COPY

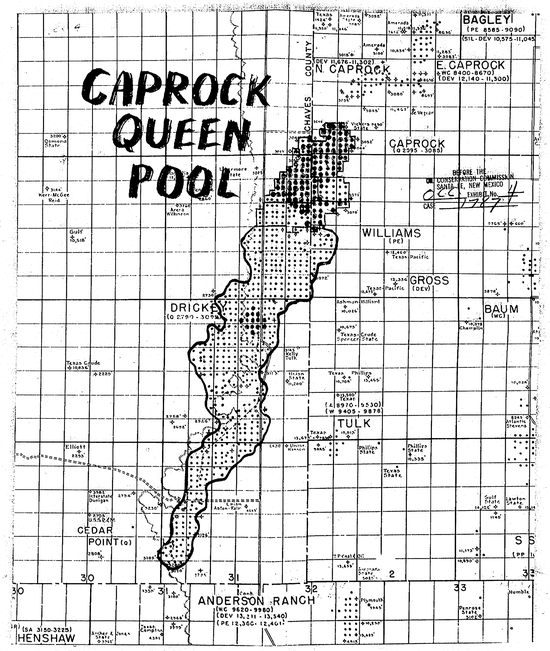
59

HIGH LONESOME POOL



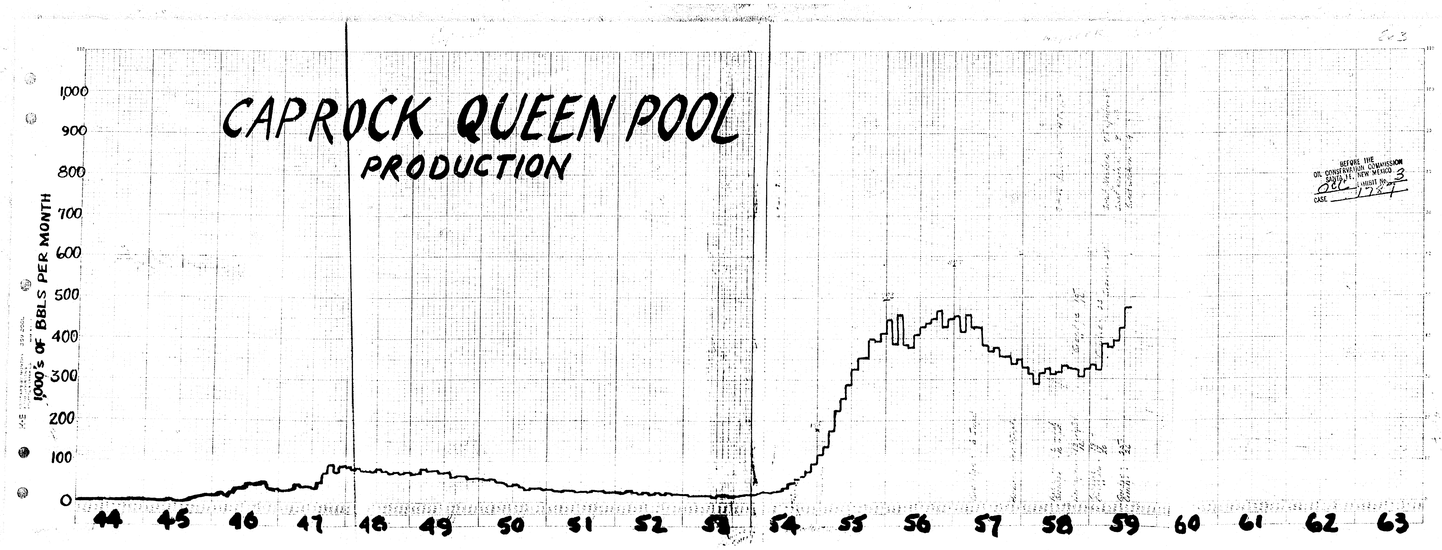
U.N.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY

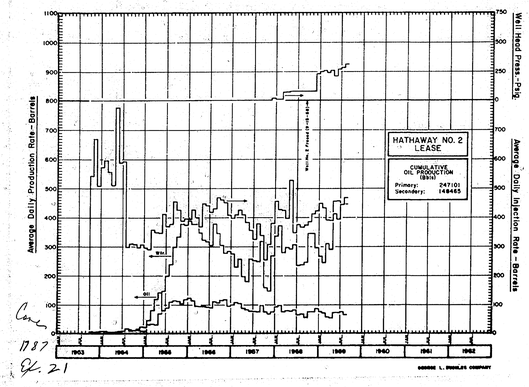


N.M.O.C.C. MICROGRAPHICS
BEST AVAILABLE COPY

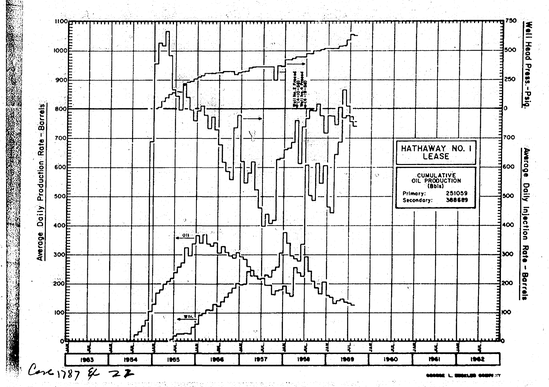



CAPROCK QUEEN POOL
PRODUCTION
1000's OF BBLS PER MONTH
1000
900
800
700
600
500
400
300
200
100
0
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT NO. 3
CASE 1727


U.N.M.C.F. MICROGRAPHICS



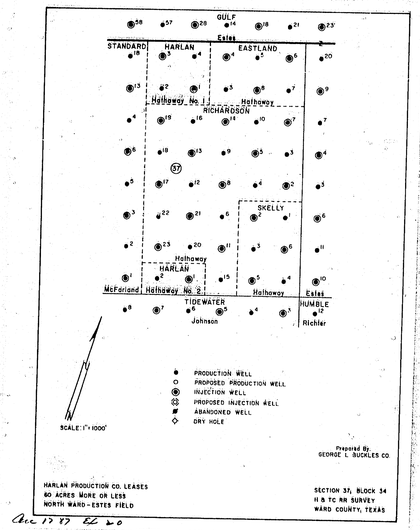
Conc 1787 Ex. 21



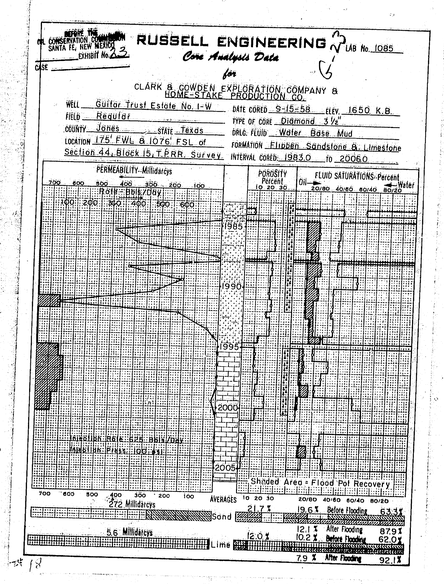
Conc 1787 Ex 22

W.N.M.C.P. MICROGRAPHICS

BEST AVAILABLE COPY

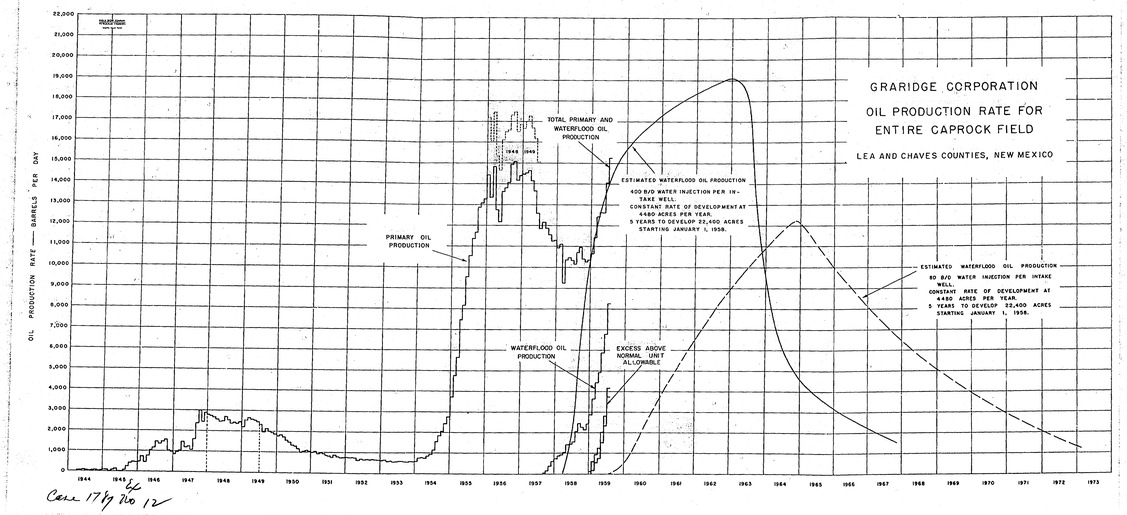


Dec 17 57 Ec 20



N.M.O.C.C. MICROGRAPHICS

BEST AVAILABLE COPY



Case 179 Exh 12

W.N.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY

SUMMARY OF STRIPPER WATERFLOOD ALLOWABLES IN TEXAS, September, 1959

(1) RRC Dist. #	(2) No. Fields	(3) No. Lses. Under WF	(4) NUMBER WELLS Prod.	(5) Injec.	(6) Total	(7) ALLOWABLE Prorated	(8) Marg.	(9) Exempt	(10) Avg. allow. per well per calendar day prod.& inj.	(11) Total allow. above ydstk. for lses. under WF/day
1	11	14	222	76 /	298 /	2,286	364	51	3.7	
2	4	4	12	11 /	23 /			58	2.5	
3	5	5	18	18 /	36 /		100	102	5.6	
4	32	96	940	352 /	1,292 /	822	2,544	8,063	8.4	891
5	3	22	204	20 /	224 /	359	64	861	4.6	
6	5	9	148	27	175	364	93	1,339	8.8	29
7-B	70*	366	2,579	443 /	3,022/	4,268	1,348#	12,672#	5.2	1,085
7-C	11	37	320	106 /	426 /	614	664	5,654	15.3	2,755
8	25	506	3,688	2,311	5,999	6,137	1,527	96,841	16.7	31,408
9	80*	909	6,084	1,841 /	7,925 /	6,780	2,283#	52,725#	7.2	4,100
10**	4**	36	425	119 /	544		@@	3,162	5.8	
TOTAL	250	2,004	14,640	5,324 /	19,964	21,630	8,987	181,531	9.87	40,268

SUMMARY:	
Avg. calendar day allowable as of 9/26/59	2,795,625
Est. daily allowable for stimulated floods, 75% of Columns 7 and 9	141,015
Stimulated flood allowable % of state	5.044%
Total flood allowable above ydstk./cal. day	40,268
Flood allowable above ydstk. % of state	1.440%

County Regular Marginal and Exempt	33,486
Exempt Excluding County Regular	148,045
Panhandle Marginal and Exempt	3,162
Exempt Excluding County Regular and Panhandle	144,883

SYMBOLS:
*Include County Regulars
#County Regular Marg. incl. in Exempt Column
**4 our counties
@Panhandle Exempt.
@@Incl. in Exempt. Column

Case 1787
Ex No. IX

5.04% with Local oil

DATA BY
Edgerton & Stearns
Austin, Texas

V.N.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY

Exhibit ___

RELATION OF WATERFLOOD TO TOTAL OIL PRODUCTION

KANSAS

Year	Total Oil Bbl/Dy	Waterflood Oil Bbl/Dy	Waterflood Oil % of Total	Projects Reported
1958	329,000	47,000	14.25	240
1957	340,000	46,000	13.62	212
1956	341,000	41,000	12.36	217
1955	332,000	41,000	12.46	188
1954	324,000	31,000	9.47	173
1953	313,000	30,000	9.54	182
1952	313,000	27,000	8.75	170
1951	312,000	22,000	7.12	143
1950	294,000	19,000	6.52	137
1949	274,000	19,000	7.00	150

Source: Annual data published by State Geological Survey of Kansas.

BY:

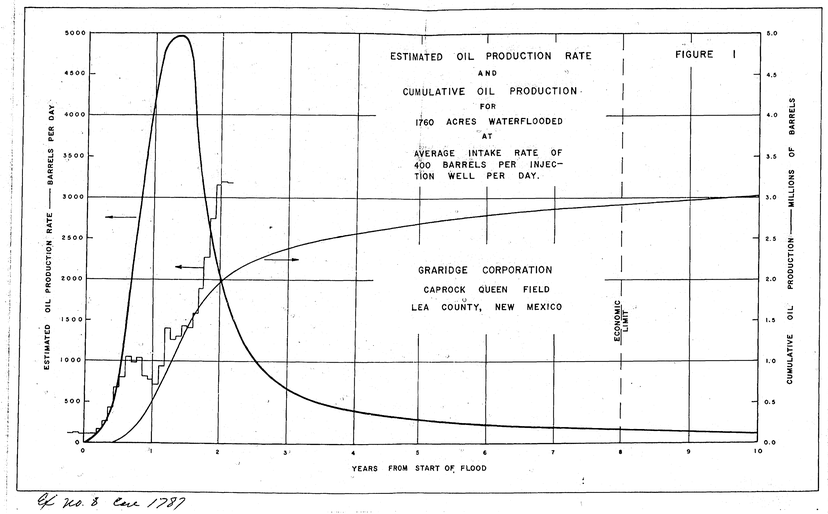


FIGURE 1

Gf No. 8 Case 1787

N.M.O.C.C. MICROGRAPHICS

BEST AVAILABLE COPY

EXHIBIT

WATERFLOOD PRODUCTION IN OKLAHOMA - MAY, 1959

(NO PRORATION OF WATERFLOODS)

RANGE - B/D/total well	NUMBER OF PROJECTS	NUMBER OF WELLS			PIPELINE RUNS - MAY, 1959		PRODUCTION IN EXCESS OF 20 B/D/TOTAL WELL	
		INPUT	OIL WELLS	TOTAL	MONTHLY	DAILY/TOTAL WELL	DAILY	PERCENTAGE OF STATE TOTAL PROD. 2/
60 and above 1/	4	2	9	11	22,144	64.9	494	.0009
50 thru 59	1	9	32	41	63,643	50.1	1,233	.0022
40 thru 49	4	8	29	37	49,934	43.5	871	.0016
30 thru 39	8	79	181	260	273,103	33.9	3,610	.0065
20 thru 29	22	276	714	990	755,939	24.6	4,388	.0078
Less than 20	604 (94%)	11,026	16,171	27,197	3,161,127	3.8	-	
Totals	643	11,400	17,136	28,536	4,325,890 3/	4.9	10,596	

= 1.9% of total State production
= 7.6% of total Waterflood production

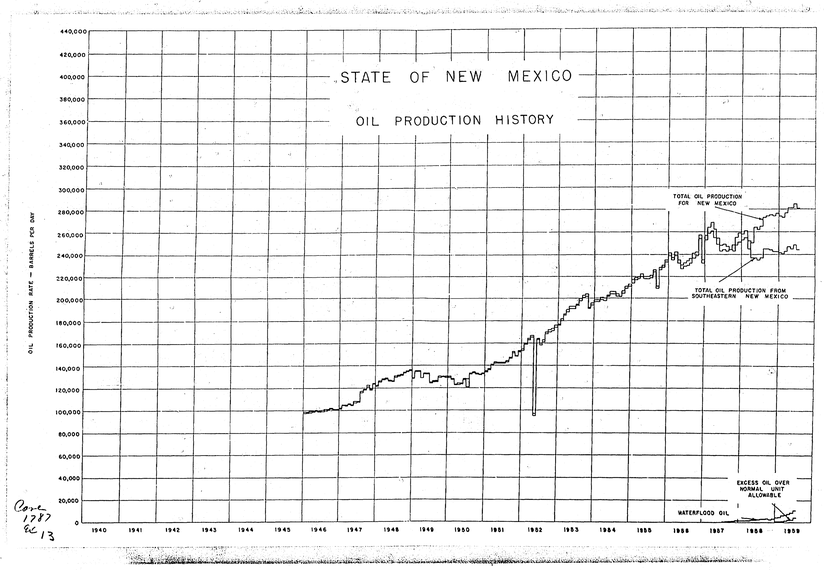
1/ Highest daily rate of all Oklahoma waterfloods, was 74 B/D/total well.

2/ Total State production during May, 1959 averaged 556,856 B/D.

3/ Total Waterflood production during May, 1959, averaged 139,545 B/D, or 25.06% of States total production.

Case 1787 Gf. 16

W. E. STILES ENGINEERING



W.N.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY

Case 1787
EL 13

Exhibit ___

KANSAS OIL PRODUCTION STATISTICS

8 Months 1959

	Prorated Table "B" Pools			Partially Restricted Table "C" Pools			Unprorated Table "D" Pools			Total All Pools		
Month	Wells	Total B/D	Average B/W/D	Wells	Total B/D	Average B/W/D	Wells	Total B/D	Average B/W/D	Wells	Total B/D	Average B/W/D
January	6,188	120,915	20	4,517	57,040	13	35,377	149,646	4	46,082	327,601	7
February	6,253	129,017	21	4,539	59,596	13	35,390	152,739	4	46,182	341,352	7
March	6,319	129,255	20	4,550	59,109	13	35,313	152,737	4	46,182	341,103	7
April	6,316	130,161	20	4,550	59,720	13	35,346	154,152	4	46,212	343,973	7
May	6,404	120,360	19	4,551	53,933	12	35,367	151,978	4	46,322	326,279	7
June	6,533	116,543	18	4,567	57,501	13	35,302	154,698	4	46,402	330,742	7
July	6,604	113,733	17	4,516	56,126	12	35,392	142,968	4	46,512	312,827	7
August	6,503	111,153	17	4,647	54,241	12	35,452	150,041	4	46,602	315,435	7
8 mos. 1959 Average -	6,416	121,723	19	4,563	57,033	12	35,377	151,120	4	46,357	326,126	7

Source: Monthly proration reports of the Kansas Corporation Commission.

Case 1787

EL 17

Case 1787
Ex 15

EXHIBIT

SUMMARY OF WATERFLOODING IN OKLAHOMA

May, 1959

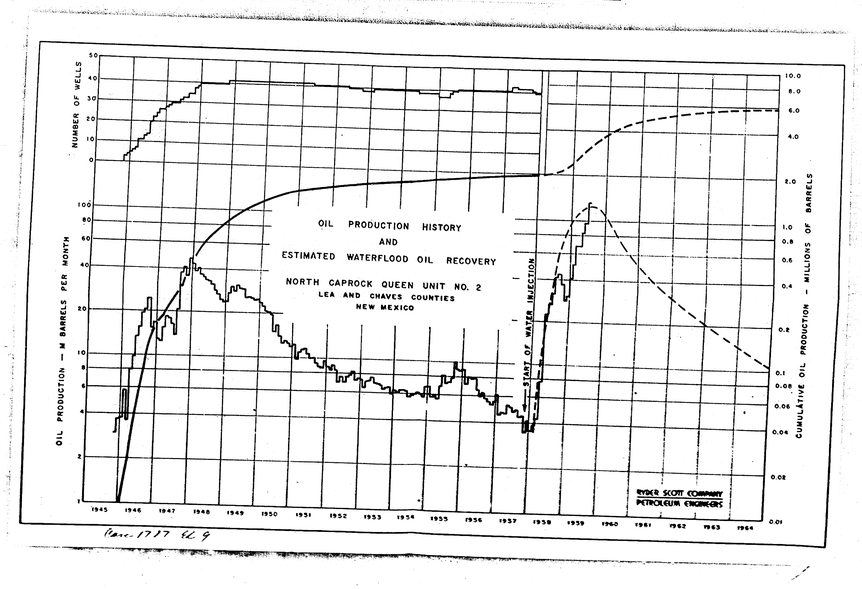
Total State Production, B/D	556,856
Minimum Allowable, B/D	20
WATERFLOOD PRODUCTION:	
Daily average	139,544
% of Total State Production	25.06
Number of Waterflood oil wells	17,136
Number of Waterflood input wells	11,400
Total wells	28,536
Waterflood production; B/D/oil well	8.14
Waterflood production; B/D/total well	4.89
Number of authorized projects included 1/	643

1/ 28 projects are not included; These projects did not report the amount of oil produced.

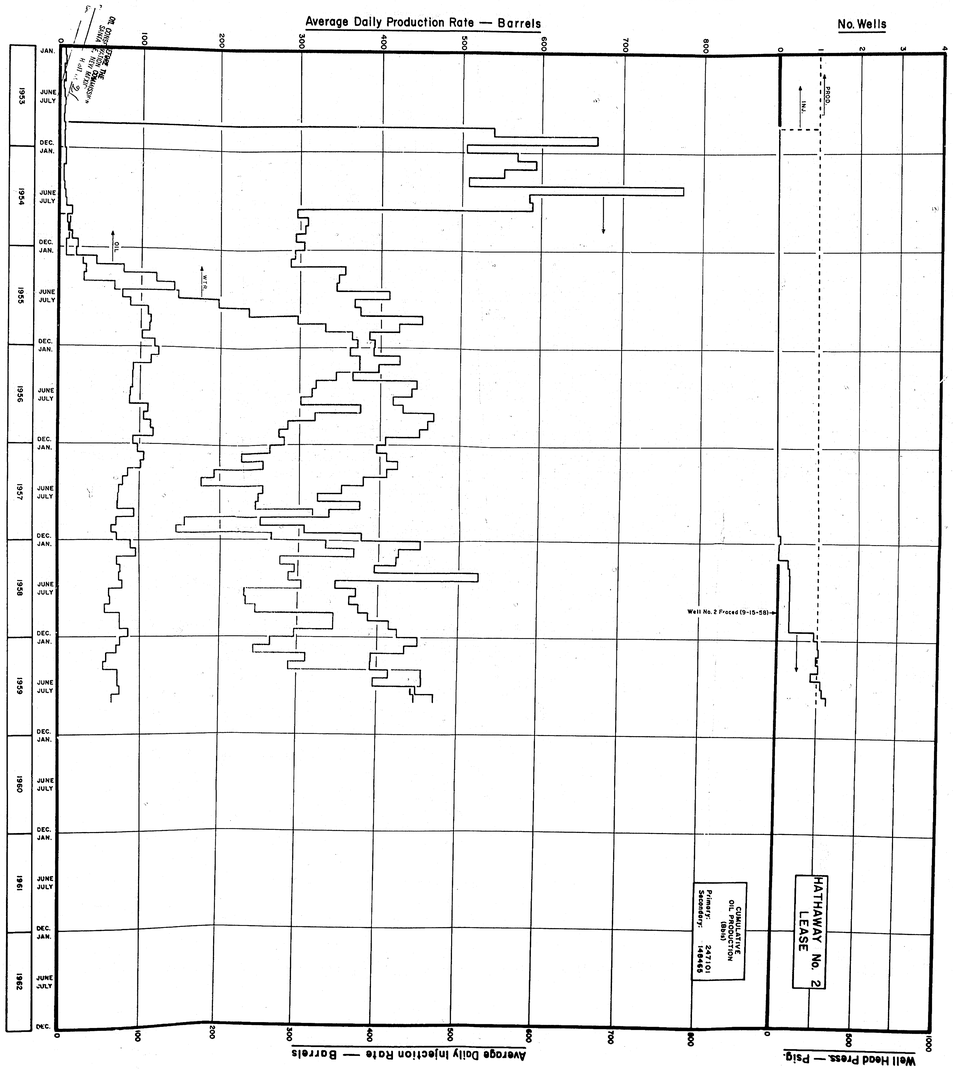
W.N.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY

W. E. STILES ENGINEERING

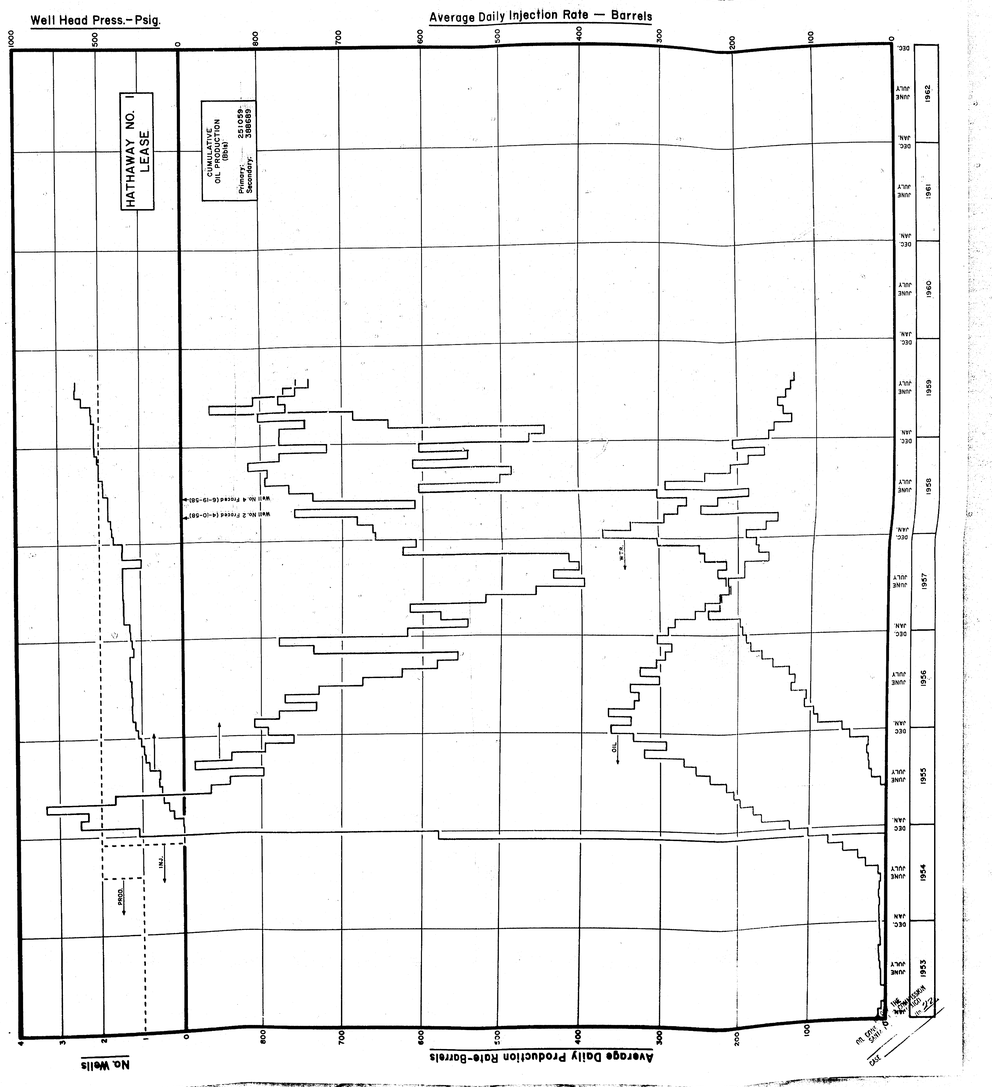


Case 1787 Ex 9



W.N.M.C.P. MICROGRAPHICS

BEST AVAILABLE COPY


Well Head Press.–Psig.
Average Daily Injection Rate — Barrels
HATHAWAY NO. 1 LEASE
CUMULATIVE OIL PRODUCTION FROM:
Primary: 251059
Secondary: 388689
WELL NO. 4 FROZE (5-19-58)
WELL NO. 2 FROZE (4-10-58)
1962
1961
1960
1959
1958
1957
1956
1955
1954
1953
DEC.
JAN.
JUNE
JULY
No. Wells
Average Daily Production Rate-Barrels
Average Daily Injection Rate-Barrels


W.R.H.C.F. MICROGRAPHICS
BEST AVAILABLE COPY

RYDER SCOTT COMPANY
PETROLEUM ENGINEERS

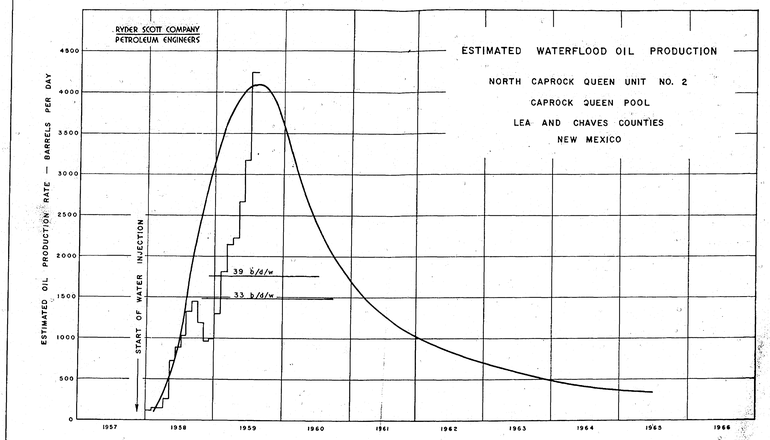
ESTIMATED WATERFLOOD OIL PRODUCTION

NORTH CAPROCK QUEEN UNIT NO. 2

CAPROCK QUEEN POOL

LEA AND CHAVES COUNTIES

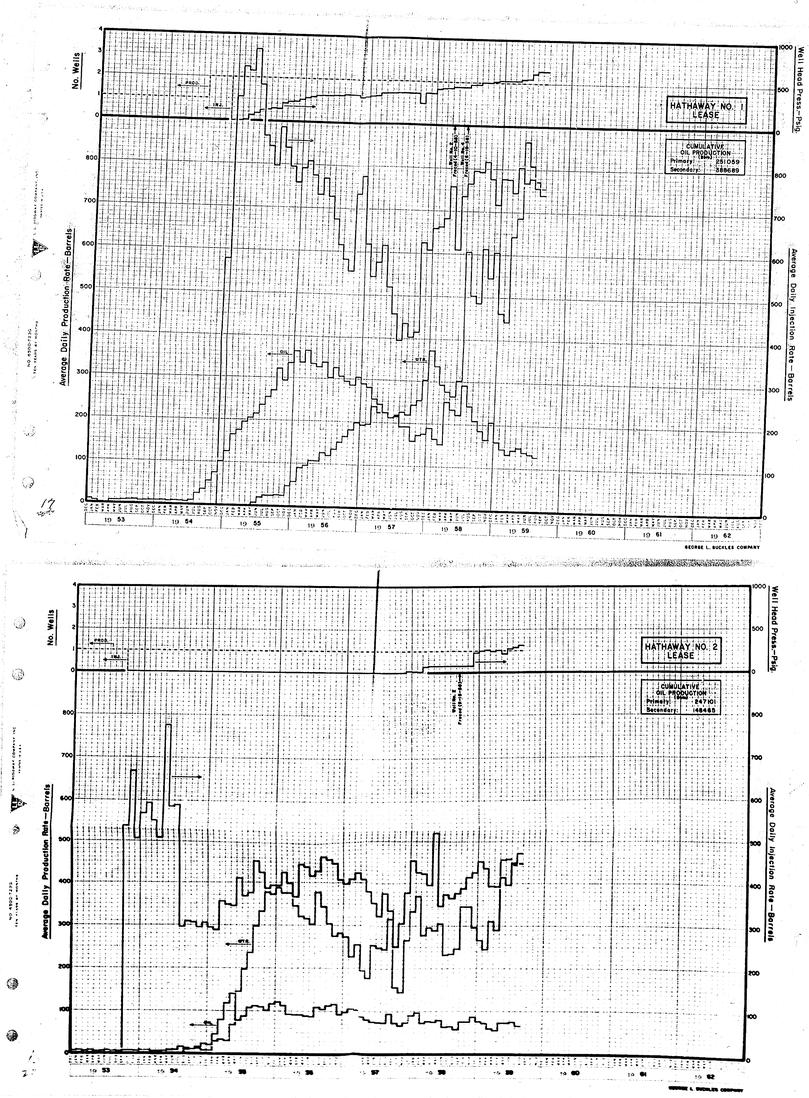
NEW MEXICO



Unc 1737 24 10

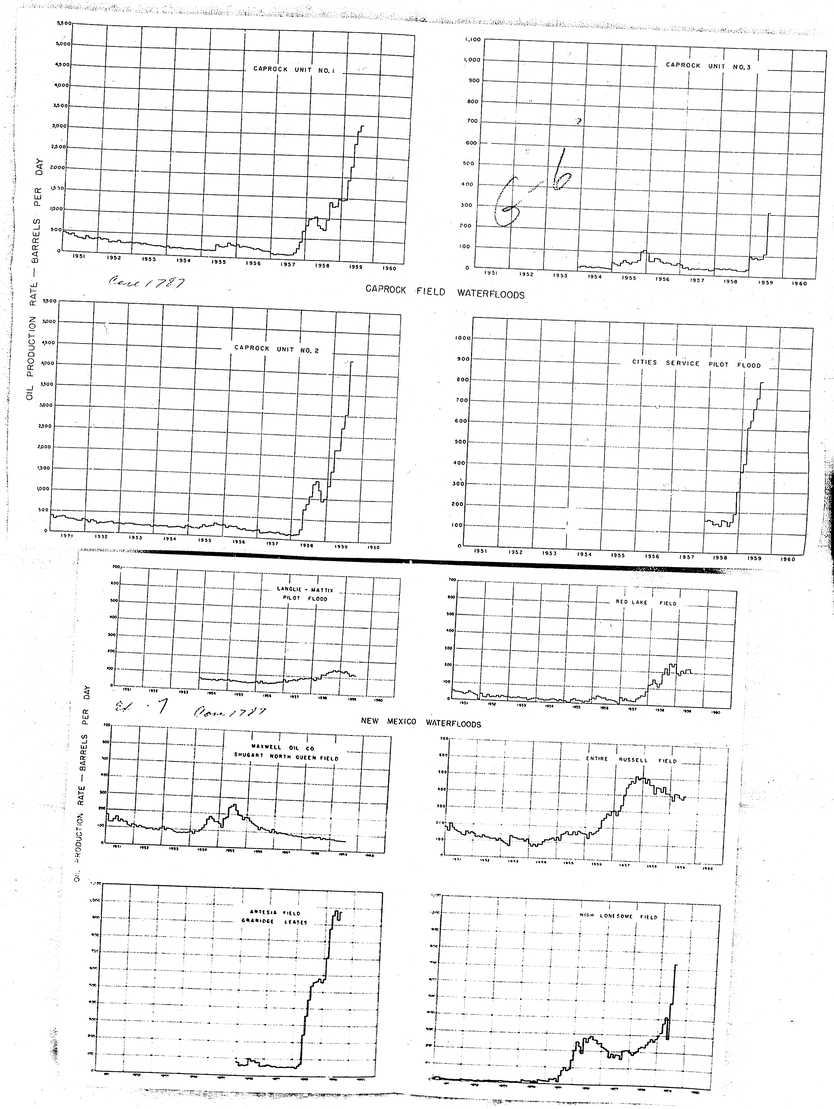
W.N.M.C.P. MICROGRAPHICS

BEST AVAILABLE COPY



N.M.O.C.C. MICROGRAPHICS

BEST AVAILABLE COPY



Case 1787

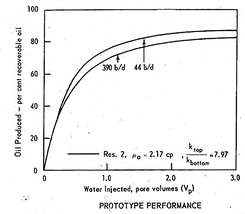
CAPROCK FIELD WATERFLOODS

Ex. 7 Case 1787

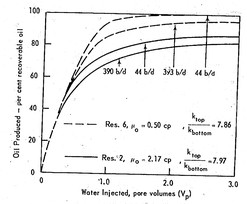
NEW MEXICO WATERFLOODS

N.M.O.C.C. MICROGRAPHICS

BEST AVAILABLE COPY



PROTOTYPE PERFORMANCE

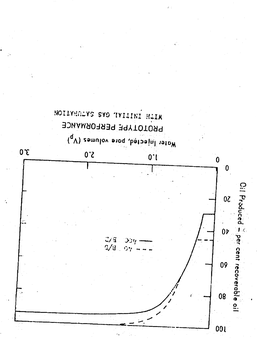


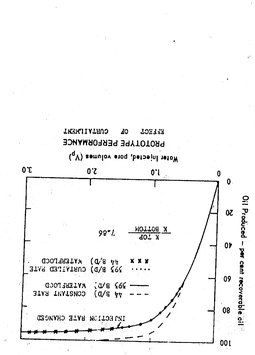
PROTOTYPE PERFORMANCE

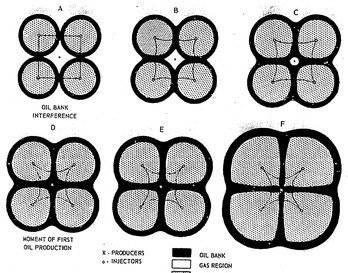
W.N.M.C.F. MICROGRAPHICS

BEST AVAILABLE COPY

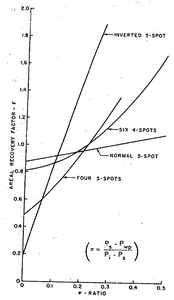

U.N.M.C.P. MICROCHARTICS
NEW MEXICO CSET


PROTOTYPE PERFORMANCE
WITH INITIAL GAS SATURATION
Water injected, pore volumes (V_p)
0
1.0
2.0
3.0
0
20
40
60
80
100
Oil Produced - per cent recoverable oil


PROTOTYPE PERFORMANCE
EFFECT OF CONTAINMENT
Water injected, pore volumes (V_p)
0
1.0
2.0
3.0
0
20
40
60
80
100
Oil Produced - per cent recoverable oil
INJECTION RATE CHANGED
44 B/D) CONSTANT RATE
395 B/D; WATERFLOOD
393 B/D) CONSTRICED RATE
44 B/D) WATERFLOOD
X TOP
X BOTTOM 7.66



Fluid migration out of a five-spot in a pressure-depleted, dissolved gas drive reservoir.
(After Fischer and Matthews)



EFFECT OF OPERATING CONDITIONS ON AREAL RECOVERY FACTOR

(After Dalton, Rapoport, and Carpenter-AIME 10-59)

W.N.M.C.P. MICROGRAPHICS

BEST AVAILABLE COPY

SUMMARY OF STRIPPER WATERFLOOD ALLOWABLES IN TEXAS, September, 1959

(1) RRC Dist.#	(2) No. Fields	(3) No. Leas. Under WF	(4) NUMBER WELLS Prod.	(5) Injec.	(6) Total	(7) ALLOWABLE Prorated	(8) Marg.	(9) Exempt.	(10) Ref. allow. per well per calendar day prod.& inj.	(11) Total allow. above yields, for leas. under WF/day
1	11	13	222	76 /	298 /	2,286	364	51	3.7	
2	4	4	12	11 /	23 /			58	2.5	
3	5	5	18	18 /	36 /		100	102	5.6	
4	32	96	940	352 /	1,292 /	822	2,544	8,063	8.4	891
5	3	22	204	20 /	224 /	359	64	864	4.6	
6	5	9	148	27	175	364	93	1,339	8.8	29
7-B	70*	366	2,579	443 /	3,022/	4,266	1,348@	12,672#	5.2	1,085
7-C	11	37	320	106 /	426 /	614	664	5,654	15.3	2,755
8	25	506	3,688	2,311	5,999	6,137	1,527	96,841	16.7	31,408
9	80*	909	6,084	1,841 /	7,925 /	6,780	2,283@	52,725#	7.2	4,100
10**	4**	36	425	119 /	544	8	862	3,162	5.8	
TOTAL	250	2,004	14,640	5,324 /	19,964	21,630	8,987	181,531	9.87	40,268

SUMMARY:	
Avg. calendar day allowable as of 9/26/59	2,795,625
Est. daily allowable for stimulated floods, 75% of Columns 7 and 9	141,015
Stimulated flood allowable % of state	5.044%
Total flood allowable above ydstk./cal. day	40,268
Flood allowable above ydstk. % of state	1.440%

County Regular Marginal and Exempt	33,186
Exempt Excluding County Regular	148,045
Panhandle Marginal and Exempt	3,162
Exempt Excluding County Regular and Panhandle	144,883

SYMBOLS:
*Include County Regulars
/County Regular Marg. incl. in Exempt Column
**Four counties
@Panhandle Exempt.
#Incl. in Exempt. Column

DATA BY
Edgerton & Stearns
Austin, Texas

BEFORE THE OIL CONSERVATION COMMISSION SANTA FE, NEW MEXICO EXHIBIT No. 14 CASE

N.M.W.C.F. MICROGRAPHICS

BEST AVAILABLE COPY

Exhibit ___

BEFORE THE OIL CONSERVATION COMMISSION SANTA FE, NEW MEXICO EXHIBIT No. 17 CASE

KANSAS OIL PRODUCTION STATISTICS

8 Months 1959

Month	Prorated Table "B" Pools Wells	Total B/D	Average B/W/D	Partially Restricted Table "C" Pools Wells	Total B/D	Average B/W/D	Unprorated Table "D" Pools Wells	Total B/D	Average B/W/D	Total All Pools Wells	Total B/D	Average B/W/D
January	6,188	120,915	20	4,517	57,040	13	35,377	149,646	4	46,082	327,601	7
February	6,253	129,017	21	4,539	59,596	13	35,390	152,739	4	46,182	341,352	7
March	6,319	129,215	20	4,550	59,105	13	35,313	152,739	4	46,182	341,103	7
April	6,316	130,451	20	4,550	58,720	13	35,346	154,152	4	46,212	343,073	7
May	6,404	120,362	19	4,553	53,933	12	35,367	151,978	4	46,324	326,279	7
June	6,533	117,543	18	4,567	57,501	13	35,312	154,698	4	46,412	330,742	7
July	6,604	113,733	17	4,576	56,126	12	35,392	142,968	4	46,572	312,827	7
August	6,543	111,153	17	4,647	54,241	12	35,452	150,041	4	46,642	315,435	7
8 mos. 1959 Average -	6,416	121,723	19	4,563	57,033	12	35,377	151,120	4	46,357	326,126	7

Source: Monthly proration reports of the Kansas Corporation Commission.

Exhibit ___

RELATION OF WATERFLOOD TO TOTAL OIL PRODUCTION

KANSAS

Year	Total Oil Bbl/Dy	Waterflood Oil Bbl/Dy	Waterflood Oil % of Total	Projects Reported
1958	329,000	47,000	14.25	240
1957	340,000	46,000	13.62	212
1956	341,000	41,000	12.36	217
1955	332,000	41,000	12.46	188
1954	324,000	31,000	9.47	173
1953	313,000	30,000	9.54	182
1952	313,000	27,000	8.75	170
1951	312,000	22,000	7.12	143
1950	294,000	19,000	6.52	137
1949	274,000	19,000	7.00	150

Source: Annual data published by State Geological Survey of Kansas.

Conv. 1787
Ex. 18

W.N.H.C.F. MICROGRAPHICS

BEST AVAILABLE COPY