DAG:MOK 2/13/46 Sec

DEPARTMENT OF THE INTERIOR

UNITED STATES OF AMERICA

WASHINGTON, D. C.

IN THE MATTER OF APPLICATION)
Comanche)
FOR DESIGNATION OF [redacted]-)
)
[redacted] UNIT AREA.)

Application for Designation
of a Unit Area for the [redacted] Comanche
[redacted] Area in the State of
New Mexico.

TO THE HONORABLE SECRETARY OF THE INTERIOR:

The application of HIGHFIELD OIL CORPORATION, a Delaware corporation, hereinafter referred to as "Applicant", respectfully shows:

That the following described area lies on the Northwestern Shelf of the South Permian structural Basin and includes parts of T. 10 S., R. 25 E., T. 10 S., R. 26 E., T. 11 S., R. 25 E., T. 11 S., R. 26 E., and T. 11 S., R. 27 E., New Mexico Principal Meridian in the State of New Mexico. Said area, hereinafter referred to as the Comanche "[redacted] Area" is described as follows:

New Mexico Principal Meridian, Chaves County, New Mexico

T. 10 S., R. 25 E.,

Sec. 36, S-1/2 SE-1/4.

T. 10 S., R. 26 E.,

Sec. 31, S-1/2;
Sec. 32, S-1/2;
Sec. 33, S-1/2;
Sec. 34, S-1/2 S-1/2;
Sec. 35, SW-1/4 SW-1/4.

T. 11 S., R. 25 E.,

Sec. 1, all;
Sec. 2, E-1/2 SE-1/4;
Sec. 11, E-1/2 E-1/2;
Sec. 12, all;
Sec. 13, all;
Sec. 14, E-1/2 E-1/2;
Sec. 23, E-1/2 NE-1/4;
Sec. 24, all;
Sec. 25, NE-1/4, NE-1/4 NW-1/4, NE-1/4 SE-1/4.

T. 11 S., R. 26 E.,

Fract. Sec. 1, all;
Fract. Sec. 2, all;
Fract. Sec. 3, all;
Fract. Sec. 4, all;
Fract. Sec. 9, all;
Sec. 10, all;
Sec. 11, all;
Sec. 12, all;
Sec. 13, all;
Sec. 14, all;
Sec. 15, S-1/2, S-1/2 N-1/2, NE-1/4 NW-1/4, NW-1/4 NW-1/4, and the NE-1/4 NW-1/4 and the NE-1/4 NE-1/4, EXCEPTING FROM said last two (2) mentioned quarter-quarter sections all the oil and gas lying above 1500' below the surface of the ground;
Fract. Sec. 16, all;
Fract. Sec. 21, all;
Sec. 22, all;
Sec. 23, all;
Sec. 24, all;
Sec. 25, N-1/2, SW-1/4;
Sec. 26, all;
Sec. 27, all;
Fract. Sec. 28, all;
Fract. Sec. 33, N-1/2;
Sec. 34, N-1/2, N-1/2 S-1/2;
Sec. 35, N-1/2, N-1/2 SW-1/4.

T. 11 S., R. 27 E.,

Fract. Sec. 6, all;
Sec. 7, N-1/2, SW-1/4;
Sec. 18, W-1/2;
Sec. 19, W-1/2 W-1/2.

Applicant hereby respectfully requests the Secretary of the Interior to designate the above described ~~East Hobbs~~ Comanche Area in New Mexico as a unit area pursuant to the Act of Congress approved February 25, 1920, entitled "An act to promote the mining of coal, phosphate, oil, oil shale, gas and sodium on the public domain", 41 Stat. 443, 448, 450, as amended or supplemented by the acts of March 4, 1931, 46 Stat. 1523, and August 21, 1935, 49 Stat. 677, 678; 30 U. S. C. 226, 184 and 189.

There is attached hereto, marked "Exhibit A", and by reference made a part hereof, a map outlining the desired unit area and showing by distinct symbols or colors state land, privately owned land, public land identified by Land

Office serial numbers, and ownership of all land in said area. Supporting this application and filed concurrently herewith is a geological report substantiating this application, to which reference is hereby made for further particulars.

The granting of this application to designate said ~~East Roswell~~ Comanche Area as a unit area, as herein requested, is necessary and advisable in the public interest, and the proposed unit area is reasonable and proper in that said geologic structure covers a large area composed of privately owned, state owned and federally owned land. The development of such an area by more than one operator operating independently would result in the duplication of effort, economic waste of materials, labor and natural resources. Development as a unit will permit a greater recovery of the oil and gas through adequate and effective control and prevention of wastage of reservoir energy through secondary recovery operations. The size of the unit area justifies operations on a large scale for the discovery, development, production and transportation of oil and gas and will conserve natural resources and prevent avoidable waste of oil and gas.

Applicant hereby requests that the geological report accompanying this application be considered confidential and that said report and its contents be not disclosed except to those persons in the Department of the Interior who are required to pass upon this application.

Dated this 28th day of February, 1946.

RICHFIELD OIL CORPORATION

By _____
Vice President

_____
Secretary

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STATE OF CALIFORNIA)
) ss
COUNTY OF LOS ANGELES)

On this 12th day of ~~February~~ March, in the year 1946, before me, HAZEL F. LOCKHART, a Notary Public in and for said County and State, personally appeared FRANK A. MORGAN, known to me to be the Vice President, and CLEVE B. BONNER, known to me to be the Secretary of RICHFIELD OIL CORPORATION, the corporation that executed the within instrument, known to me to be the persons who executed the within instrument on behalf of the corporation therein named, and acknowledged to me that such corporation executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

Hazel F. Lockhart
Notary Public in and for said
County and State

My commission expires:

My Commission Expires February 3, 1950

4/3/40 GAG:MCM

BEFORE THE OIL CONSERVATION COMMISSION

OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF RICHFIELD OIL CORPORATION, A DELAWARE CORPORATION, FOR AN ORDER OF APPROVAL OF THE UNIT AGREEMENT FOR THE DEVELOPMENT AND OPERATION OF THE COMANCHE AREA, CHAVES COUNTY, NEW MEXICO.

Geologic Report Accompanying Application for an Order of Approval of the Unit Agreement for the Development and Operation of the Comanche Area, Chaves County, New Mexico.

TO THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO:

The following geologic report is filed concurrently with and accompanies the application of Richfield Oil Corporation, a Delaware corporation, for an order of approval of the Unit Agreement for the Development and Operation of the Comanche Area, Chaves County, New Mexico, reference to which said application is hereby made for further particulars, and the proposed Comanche Unit Area therein described is incorporated herein and by reference made a part hereof and is hereinafter referred to as the "proposed unit area".

INTRODUCTION

Richfield Oil Corporation, hereinafter referred to as "Richfield", has for over two years intensively explored for geologic structures favorable for oil accumulation in Chaves County, New Mexico. Among the several techniques used during this period the seismograph has proved to be the most reliable for those areas where acceptable results can be obtained. After exten-

sive use of all methods Richfield drilled an exploratory well to basement for stratigraphic information essential to evaluation of the oil possibilities. Results of this exploratory work have established that the proposed unit area is particularly encouraging for exploration for commercial oil accumulation in deep strata. This conclusion is supported by the strategically high structural position of this area on an extensive homocline dipping easterly into an oil producing basin, (see Regional Map of Middle Pecos Valley Area, New Mexico, attached hereto, marked "Exhibit B", and by reference made a part hereof), the presence within the area of wells which have produced oil from shallow beds, local geologic structure as outlined by the seismograph, an encouraging stratigraphic section, and the presence of strong showings of oil and gas in the deeper beds penetrated by the Richfield U. S. Coll No. 1, the recently abandoned exploratory well which is located outside of and along the east edge of the proposed unit area.

REGIONAL GEOLOGIC SETTING

GENERAL.

Regional relationships of the proposed unit area are shown on said Exhibit B. The area lies on the Northwestern Shelf of the South Permian Basin, 35 miles north of the producing fields of the Maljamar-Artesia trend. It contains within its boundary a small oil field, named the Comanche field, with three shallow wells which have produced oil from the Permian. All of the oil and

gas lying above fifteen hundred feet (1500') below the surface of the ground in 320 acres surrounding these three small wells are excluded from the proposed unit area. The nearest pre-Permian production outside the block lies 35 miles east-southeast in the Caprock field and comes from the Queen sand of upper Permian. The nearest pre-Permian production is in the Jones field 100 miles east-southeast, in northwest Gaines County, Texas.

REGIONAL STRUCTURE.

The regional structure of the Northwestern Shelf area consists of a Permian homocline dipping east-southeast. Subsurface contours on the top of the San Andres show an average easterly dip of about 60 feet per mile between Roswell and the Caprock field, a distance of 40 miles. On this regional homocline are a number of local surface structural features such as the Y-O overthrust anticline, the Six Mile anticline, and the Elkins anticline, and, in addition, numerous subsurface structures which are apparent after detailed seismograph work. One of these subsurface structures is the well-defined anticline of the proposed unit area centering in Section 14, Township 11 South, Range 26 East, (see seismograph structure contours shown on map, "Exhibit A", attached hereto and by reference made a part hereof).

REGIONAL STRATIGRAPHY.

The regional stratigraphic section consists of Triassic red beds and sandstones of variable thickness; a thick section of Permian red beds,

evaporites and dolomites; a section of varying thickness of Pennsylvanian limestones, shales, and sandstones; and, below an unconformity at the base of the Pennsylvanian, an appreciable thickness of pre-Pennsylvanian sedimentary rocks which lie directly upon the pre-Cambrian basement (see Exhibit C). The following table lists the recognized rock formations and their known thicknesses at various points within this region, see plat showing Interpreted Regional Geologic Section from Sacramento Mountains to Northwest Gaines County, Texas, attached hereto, marked "Exhibit C", and by reference made a part hereof, (see Exhibit C for locations):

	Sacramento Mountains (feet)	Stanolind No. 1 Pichacho (feet)	Richfield No. 1 Coll (feet)	DeKalb No. 1 White (feet)	Amerada No. 1-A Jones (feet)
Whitehorse	None	None	1,075	1,640	2,540
San Andres	850±	377±	1,190	1,250	1,450
Glorieta-Yeso	550±	1,883	2,285	2,360	1,780
Abo	650±	278	720	920	1,320
Hueco	None	None	215	330	110
Pennsylvanian	1,100±	None	775	717±	1,125
Mississippian	265±	None	None		750
Devonian-Silurian	155±	None	357		4554
Ordovician	348±	None	None		
Pre-Cambrian	10*	333*	13*		

*Observed or penetrated

LOCAL GEOLOGIC SETTING

The proposed unit area, lying in the up-dip part of the Northwestern Shelf of the South Permian Basin, occupies a high structural position in relation to the major easterly dipping homocline of the Shelf area and to most of the oil productive areas of the Permian Basin of West Texas and Southeast New Mexico. The area includes a small oil field

in upper Permian rocks and, were wells sufficiently abundant and properly spaced, it is probable that structural closure in these shallow beds could be demonstrated. The gypsum bearing Permian red beds lying at or near the surface are not useful as a guide to local structure, due principally to the poor quality or lack of exposures and to extensive solution cavities and surface slumping.

SIGNIFICANCE OF COMANCHE OIL FIELD.

The small Comanche field, with its three shallow wells either idle or abandoned, is located in the NE-1/4 of the NW-1/4 and the NE-1/4 of the NE-1/4 of Section 15, Township 11 South, Range 26 East. Discovered in 1936 the field produced a total of 11,250 barrels of oil to the end of 1943. The production in 1943, the last recorded year, was 380 barrels. The producing horizon is in the upper San Andres (Permian). Although this field is of little economic importance the presence of Permian production has considerable geologic significance in that Permian productive "highs" commonly overlie highly productive pre-Permian "highs". Prolific pre-Permian production has been found beneath Permian production in the Penrose field of Lea County, New Mexico, and in the Jones, Fullerton, Embar, Bedford, Keystone, Sand Hills, Abell, Apco, Big Lake, and other fields of West Texas.

SUBSURFACE STRUCTURE.

Extensive use of a reflection seismograph crew, especially equipped to obtain results under the conditions existing in this area, has established the

presence of an anticline with known closure of about 100 feet on a horizon near the top of the Abo formation (lower Permian). Almost no information was obtainable with the seismograph north and west of this area of known closure. Additional evidence, including the structural relation of this anticline to said Coll No. 1 well in which occurred excellent showings of oil in the Devonian, indicates that this well is within the closed area, and that an additional closure of from 75 feet to 100 feet is present. Probable total closure at the top of the Abo, therefore, is 175 to 200 feet.

Structural closure in the Devonian cherty dolomite, the encouraging reservoir rock which unconformably underlies the Pennsylvanian in this immediate area, may be appreciably greater and may cover a larger area than that shown for the top of the Abo.

STRATIGRAPHIC SECTION.

It is expected that a well drilled on the closed anticline in the proposed unit area will encounter the same stratigraphic section as that penetrated by the Richfield U. S. Coll No. 1 well located along the eastern edge of this area. The Coll well was spudded on August 19, 1945, drilled to 6,630 feet, and abandoned in basement on January 16, 1946. The formations penetrated by this well include 5,485 feet of Permian, 775 feet of Pennsylvanian, 357 feet of Devonian or older age, and 13 feet of igneous rock at the bottom, see local cross section based upon combined subsurface and geophysical data, attached hereto, marked "Exhibit D", and by reference

made a part hereof. The most promising stratigraphic interval for oil possibilities in the 357 feet of Devonian or older rocks which here consist principally of cherty dolomite. This section is similar to the type of cherty dolomite that produces prolifically on the Central Basin platform in West Texas and which there is called Devonian. On the electric log of the Coll well this section appears to have considerable porosity. The strongest oil and gas shows were below 6,260 feet in Devonian and warranted testing. A preliminary formation test in this dolomite from 6,276 to 6,350 feet yielded a small flow of sweet gas, accompanied by some free oil and salt water. Two production tests through perforations in the same zone yielded approximately the same quantity of gas and considerable salt water colored with oil. Because of these shows and the known structural relation of this well to the closed subsurface anticline in deep-seated rocks of the proposed unit area, it is evident that the structurally higher parts of the seismograph anticline lying to the west of this well should encourage additional exploration.

SUMMARY OF GEOLOGICAL INFORMATION

The proposed unit area has been selected by Richfield for wildcat exploration for oil because of geological evidence considered to be outstandingly favorable. This evidence may be summarized as follows:

1. Its high structural position with regard to regional structure and the oil producing province of the Permian Basin is favorable.

2. A small shallow non-commercial oil field near its center is particularly significant in indicating favorable local structure. Deep drilling within or near known minor occurrences of oil in shallow beds has led to many major discoveries.

3. Seismograph data have established the presence of an anticline in deep Permian beds which, with little doubt, marks the position of an anticline of equal if not greater size in underlying Devonian rocks.

4. Richfield's Coll No. 1 well, recently abandoned along the eastern edge of the proposed unit area, established the presence in the Northwestern Shelf of a major unconformity at the base of the Pennsylvanian and immediately overlying a favorable section of porous Devonian dolomite which, heretofore, has been known only in subsurface producing areas of the Basin to the east and southeast.

5. The Devonian dolomite in the Coll No. 1 well yielded flowing gas and strong showings of oil. The known structural relation between this well and the anticline in the proposed unit area indicates that this well is on the eastern edge of an oil field in the Devonian dolomite.

Richfield hereby requests that this geologic report be considered confidential and that this report and its contents be not disclosed except to those persons in the Oil Conservation Commission who are required to pass upon the application of Richfield for an order approving said unit agreement.

Dated this 10th day of April, 1946.

RICHFIELD OIL CORPORATION

By _____
Vice President

_____
Secretary

STATE OF CALIFORNIA)
) SS
COUNTY OF LOS ANGELES)

On this 12th day of April, in the year 1946, before me, GEORGE R. SHEPPHIRD, a Notary Public in and for said County and State, personally appeared FRANK A. MORGAN, known to me to be the Vice President, and CLEVE B. BONNER, known to me to be the Secretary of RICHFIELD OIL CORPORATION, the corporation that executed the within instrument, known to me to be the persons who executed the within instrument on behalf of the corporation therein named, and acknowledged to me that such corporation executed the same.

IN WITNESSES WHEREOF, I have hereunto set my hand and affixed my official seal the day and year in this certificate first above written.

George R. Sheppard
Notary Public in and for said
County and State

My commission expires:
My Commission Expires Dec. 31, 1949