

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 WORMAN LAKE AREA, CHAVES )  
COUNTY, NEW MEXICO, WITHIN TOWNSHIP )  
11 SOUTH, RANGE 28 EAST, TOWNSHIP )  
12 SOUTH, RANGE 28 EAST, TOWNSHIP )  
11 SOUTH, RANGE 29 EAST, TOWNSHIP )  
12 SOUTH, RANGE 29 EAST, NEW MEXICO )  
PRINCIPAL MERIDIAN. )

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

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

I.

There is presented to the Oil Conservation Commission of the State of New Mexico the proposed form of Unit Agreement for the Development and Operation of the Worman Lake Area, Chaves County, New Mexico, hereinafter referred to as "said unit agreement"; that a true copy of the proposed form of unit agreement is attached hereto, marked "Exhibit A", and by reference made a part hereof; that the unit area described therein has heretofore been approved by the United States Geological Survey; that the form of unit agreement, Exhibit A, has heretofore been approved as to form by the Secretary of the Interior of the United States and a true copy of the letter-approval thereof is attached hereto, marked "Exhibit B", and by reference made a part hereof.

## II.

That said unit agreement will tend to promote the conservation of oil and gas and the better utilization of reservoir energy in the geologic structure covered by the unit area described therein, which is hereinafter referred to as "said unit area". The granting of this application is necessary and advisable in the public interest in that said geologic structure and said unit area cover a compact area of ten thousand sixty-six and 38/100 (10,066.38) acres, consisting of four thousand five hundred forty-six and 38/100 (4,546.38) acres, being forty-five and 17/100 per cent (45.17%), privately owned land, one thousand two hundred eighty (1,280) acres, being twelve and 71/100 per cent (12.71%), land owned by the State of New Mexico, and four thousand two hundred forty (4,240) acres, being forty-two and 12/100 per cent (42.12%), land owned by the United States of America. The development of such an area by more than one operator operating independently of each other would result in duplication of effort, economic waste of materials and labor, and possible waste of natural resources and reservoir energy. The size of said unit area justifies operations on a large scale by a single operator under the unit agreement for the discovery, development, production and transportation of oil or gas, will promote conservation of natural resources, prevent avoidable waste of oil and gas, and result in better utilization of reservoir energy.

## III.

That under the proposed unit operation the State of New Mexico will receive its fair share of the recoverable oil or gas in place under its lands in the proposed unit area. Said unit agreement provides for the unit operation of the unit area, for the allocation of production to the various tracts

of land therein on an acreage basis, all as specified in said unit agreement, Exhibit A, reference to which is hereby made for further particulars.

IV.

That the separate institutions will participate in rentals due as to lands in such area, as under the terms of the previously granted leases, and in royalties in the proportion that their acreage bears to the total acreage included in the participating area or areas of such proposed unit; that the said unit agreement does not affect the rentals payable under state leases and reference is hereby made to said unit agreement, Exhibit A, for further particulars as to the method and allocation of royalties on an acreage basis.

V.

That such unit agreement is in other respects for the best interests of the state with respect to state lands by reason of all the facts hereinabove set forth.

VI.

That it is anticipated that a very high percentage of the holders of rights or interests in state lands and in federal lands within said unit area will be satisfied with and will join in said proposed unit agreement and commit their interests thereto by signature thereto. That said unit agreement provides that the Working Interest Owners thereunder will enter into a private agreement defining the method and manner in which the costs of operations shall be charged to the accounts of the various owners of working interests and the reimbursement of Unit Operator for its operations, and the method and manner in which Unit Operator shall account to the Working Interest Owners

for their respective shares of the revenue and benefits derived from operations under said unit agreement. Said unit agreement further provides that such private agreement shall not in any way modify any of the terms and conditions of said unit agreement or relieve Unit Operator of any right or obligation established under said unit agreement, and in case of any inconsistency or conflict between said unit agreement and the private agreement said unit agreement shall prevail. Said private agreement is now being negotiated and has not yet been completed. Two authenticated copies of said private agreement when completed will be filed with this Honorable Commission for information purposes, and upon the approval of said unit agreement by the Commissioner of Public Lands of the State of New Mexico two authenticated copies of said private agreement will be filed with said Commissioner as provided for in section 7 of said unit agreement. No part of the costs and expenses of operations shall be charged to the Royalty Owners. The Royalty Owners, including the State of New Mexico, will not be affected by the private agreement between the Working Interest Owners and royalties will be paid on all unitized substances allocated to the various tracts of land within the participating area on an acreage basis as provided in said unit agreement.

#### VII.

Geological and Engineering Data: That said unit area lies on the Northwestern Shelf of the South Permian structural Basin and includes parts of Township 11 South, Range 28 East, Township 11 South, Range 29 East, Township 12 South, Range 28 East, and Township 12 South, Range 29 East, New Mexico Principal Meridian, Chaves County, in

the State of New Mexico. Said unit area is particularly described as follows:

T. 11 S., R. 28 E., sec. 36,  $E\frac{1}{2}SW\frac{1}{4}$ ,  $SE\frac{1}{4}$ .

T. 12 S., R. 28 E., sec. 1, lots 1, 2, 3,  $S\frac{1}{2}NE\frac{1}{4}$ ,  
 $SE\frac{1}{4}NW\frac{1}{4}$ ,  $E\frac{1}{2}SW\frac{1}{4}$ ,  $SE\frac{1}{4}$ ;  
sec. 12,  $E\frac{1}{2}$ ,  $E\frac{1}{2}W\frac{1}{2}$ ;  
sec. 13,  $E\frac{1}{2}$ ,  $E\frac{1}{2}W\frac{1}{2}$ ;  
sec. 24,  $E\frac{1}{2}NE\frac{1}{4}$ .

T. 11 S., R. 29 E., sec. 31, lots 3, 4,  $E\frac{1}{2}SW\frac{1}{4}$ ,  $SE\frac{1}{4}$ .

T. 12 S., R. 29 E., sec. 5,  $SW\frac{1}{4}$ ,  $SW\frac{1}{4}SE\frac{1}{4}$ ;  
sec. 6, lots 1, 2, 3, 4, 5, 6,  
7,  $S\frac{1}{2}NE\frac{1}{4}$ ,  $SE\frac{1}{4}NW\frac{1}{4}$ ,  
 $E\frac{1}{2}SW\frac{1}{4}$ ,  $SE\frac{1}{4}$ ;  
sec. 7, all;  
sec. 8, all;  
sec. 16,  $NW\frac{1}{4}SW\frac{1}{4}$ ,  $S\frac{1}{2}S\frac{1}{2}$ ;  
sec. 17, all;  
sec. 18, all;  
sec. 19, all;  
sec. 20, all;  
sec. 21, all;  
sec. 28, all;  
sec. 29, all;  
sec. 30, all;  
sec. 31, lots 1, 2, 3,  $NE\frac{1}{4}$ ,  
 $E\frac{1}{2}NW\frac{1}{4}$ ,  $NE\frac{1}{4}SW\frac{1}{4}$ ,  $N\frac{1}{2}SE\frac{1}{4}$ ;  
sec. 32,  $NW\frac{1}{4}$ .

Containing 10,066.38 acres, more or less.

That there is contained in the form of said unit agreement, Exhibit A attached hereto, as Exhibit A thereto, a map outlining the unit area and showing by distinct symbols or colors state land, privately owned land, and land owned by the United States of America identified by Land Office serial numbers, and the ownership of all land in said unit area. Reference is hereby made to said map for further particulars.

A regional map showing the location of said unit area is attached hereto and marked "Exhibit C" and by reference made a part hereof.

Applicant 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 extensive use of all methods Applicant drilled an exploratory well to basement for stratigraphic information essential to evaluation of the oil possibilities. The results of this exploratory work have established that the district (1) contains a number of attractive closed anticlines, and (2) is underlain at reasonable depths by rocks that are identical in oil source and reservoir character to those which produce oil and gas in the New Mexico-West Texas Permian Basin. The proposed unit area herein described involves one of the anticlines that has been mapped by detailed seismograph work. It lies about twelve miles east-southeast and basinward from the above mentioned exploratory well. A geologic report covering said unit area has heretofore been filed with the Department of the Interior of the United States in the Matter of the Application for Designation of the Worman Lake Unit Area by the United States Geological Survey. A copy of said geologic report has heretofore been filed with Mr. R. R. Spurrier, State Geologist of the State of New Mexico, and an identical geologic report has been filed concurrently herewith with your Honorable Commission.

Applicant hereby respectfully requests that said geologic report be considered confidential and that said geologic report be not disclosed except to those persons in the Conservation Commission of the State of New Mexico who are required to pass upon this application for an order of approval of said unit agreement. Said geologic report and its contents are hereby referred to in connection with this application.

VIII.

That the development of the pool or field underlying said unit area pursuant to the terms of said unit agreement will have the effect of preventing waste as prohibited by Chapter 72 of the Laws of New Mexico, 1935, and said agreement is fair to the Royalty Owners and the Working Interest Owners in such pool or field.

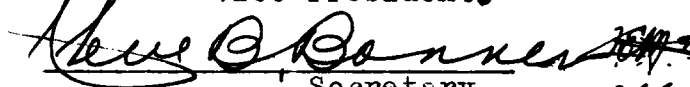
WHEREFORE, your Applicant respectfully requests that the Oil Conservation Commission of the State of New Mexico enter its order in this matter approving the Unit Agreement for the Development and Operation of the Worman Lake Area, Chaves County, New Mexico, same being the agreement attached hereto and marked "Exhibit A", and that your Applicant as Unit Operator under said agreement be permitted to file with the Commission an executed original of said unit agreement and two authenticated copies of said private agreement on or before the effective date thereof, or within a reasonable time thereafter.

Dated this 17th day of July, 1946.

RICHFIELD OIL CORPORATION

By

  
Vice President

  
Secretary

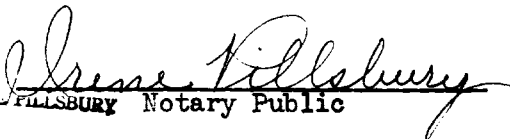
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STATE OF CALIFORNIA     )  
                                  )   SS  
COUNTY OF LOS ANGELES   )

On this 17th day of July, 1946, before me personally appeared DAVID E. DAY, to me personally known, who being by me duly sworn did say that he is the Vice President of RICHFIELD OIL CORPORATION and that the seal affixed to said instrument is the corporate seal of said corporation and that said instrument was signed and sealed in behalf of said corporation by authority of its Board of Directors, and said DAVID E. DAY acknowledged said instrument to be the free act and deed of said corporation.

Witness my hand and official seal the day and year last above written.

My Commission Expires February 3, 1950

  
JESSE PILLSBURY Notary Public



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 WORMAN LAKE AREA, CHAVES )  
COUNTY, NEW MEXICO. )

Geologic Report Accompanying  
Application for an Order of  
Approval of the Unit Agreement  
for the Development and Opera-  
tion of the Worman Lake 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 Worman Lake Area, Chaves County, New Mexico, reference to which said application is hereby made for further particulars, and the proposed Worman Lake 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 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 useful in obtaining quantitative structural data in those areas where acceptable results can be obtained. After extensive use of all methods Richfield drilled

an exploratory well to basement for stratigraphic information essential to evaluation of the ability of subsurface rocks to contain and produce commercial quantities of oil and gas. Results of this exploratory work have established that this district (1) contains a number of attractive closed anticlines, and (2) is underlain at reasonable depths by rocks that are identical in oil-source and reservoir character to those which produce oil and gas elsewhere in the New Mexico-West Texas Permian Basin. The proposed unit area herein described involves one of the anticlines that has been mapped by detailed seismograph work, (see Exhibit A). It lies twelve miles east-southeast and basinward from the above mentioned exploratory well.

#### REGIONAL GEOLOGIC SETTING

##### GENERAL

Regional relationships of the proposed unit area are shown on Exhibit B. The area lies on the Northwestern Shelf of the South Permian Basin, 25 to 30 miles north of the oil fields of the Maljamar-Artesia trend and 18 miles west-northwest of the Caprock field, all of which produce oil from Permian rocks. Pre-Permian rocks, the major objective for possible production in the unit area herein proposed, produce oil in the Jones field, 65 miles east-southeast, and have been found to contain showings of oil and gas in the Richfield-U. S. Coll No. 1 well, 12 miles west-northwest in Section 18, Township

11 South, Range 27 East.

#### REGIONAL STRUCTURE

The regional structure of the Northwestern Shelf area consists of a Permian homocline dipping east-southeast, (see Exhibit B). Subsurface contours on the top of the San Andreas 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 located principally in the western part of Township 12 South, Range 29 East, (see Exhibit A).

#### 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 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	263+	None	None		750
Devonian-Silurian	155+	None	357		455+
Ordovician	348+	None	None		
Pre-Cambrian	10*	333*	13*		

\*Observed and 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 surface of this immediate area is covered by a thin mantle of sand and caliche which entirely conceals underlying rocks and prevents mapping of local structure by the usual surface methods.

#### 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 (see Exhibit A) with structural closure of 150 feet on a subsurface horizon near the base of the Pennsylvanian. It has recently become evident from information obtained from Richfield's U. S. Coll No. 1 well that the base of the Pennsylvanian marks the position of a major unconformity. It

is probable, therefore, that structural closure in the underlying pre-Pennsylvanian rocks is appreciably greater than the 150 feet shown by Exhibit A.

#### STRATIGRAPHIC SECTION

It is expected that a well drilled on the anticline in the proposed unit area will penetrate some 250 feet of Triassic red beds and then will encounter a stratigraphic section similar to, but slightly thicker than, that penetrated by the Richfield-U. S. Coll No. 1 well, (see Exhibit D). This well penetrated 5,485 feet of Permian, 775 feet of Pennsylvanian, 357 feet of Devonian, and 13 feet of igneous rock. The most promising stratigraphic intervals for oil production are (1) the Devonian rocks, which here consist principally of cherty and porous dolomite, and (2) those Mississippian and pre-Devonian rocks which, because of unconformities at the top and base of the Devonian, were missing in the Richfield-U. S. Coll No. 1 well 12 miles west-northwest. Much of this missing stratigraphic section, particularly the Ordovician and Silurian, produces oil prolifically in many of the fields of West Texas.

#### SUMMARY OF GEOLOGICAL INFORMATION

The proposed unit area embodies all of those geological conditions commonly considered essential and favorable for oil accumulation in commercial quantities, namely:

- (1) known source beds
- (2) porous reservoir horizons, and
- (3) a closed anticlinal structure.

In addition, the area lies in a known oil producing

basin and is favorably located up-dip from most  
of the known producing fields of this province.

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  
Department of the Interior who are required to pass upon  
the application of Richfield for the designation of the  
proposed unit area.

Dated this \_\_\_\_\_ day of May, 1946.

RICHFIELD OIL CORPORATION

By \_\_\_\_\_  
Vice President

\_\_\_\_\_  
Secretary

STATE OF CALIFORNIA     )  
                                  ) SS  
COUNTY OF LOS ANGELES )

On this \_\_\_\_\_ day of May, in the year 1946, before me,  
\_\_\_\_\_, a Notary Public in and for  
said County and State, personally appeared FRANK A. MORGAN,  
known to me to be the Vice President, and \_\_\_\_\_,  
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 certifi-  
cate first above written.

\_\_\_\_\_  
Notary Public in and for said  
County and State

My commission expires:  
\_\_\_\_\_