

CASE 3770: Application of TEXAS
PACIFIC OIL CO. FOR A WATERFLOOD
PROJECT, LEA COUNTY, NEW MEXICO.

Case Number

3770

Application

Transcripts.

Small Exhibits

ETC.

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE No. 3770
Order No. R-3421

APPLICATION OF TEXAS PACIFIC OIL
COMPANY FOR A WATERFLOOD PROJECT,
LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 8 a.m. on May 22, 1968,
at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 29th day of May, 1968, the Commission, a
quorum being present, having considered the testimony, the record,
and the recommendations of the Examiner, and being fully advised
in the premises,

FINDS:

(1) That due public notice having been given as required by
law, the Commission has jurisdiction of this cause and the subject
matter thereof.

(2) That the applicant, Texas Pacific Oil Company, seeks
permission to institute a waterflood project in the South Leonard
(Queen) Unit Area, South Leonard-Queen Pool, by the injection of
water into the Queen formation through five injection wells in
Sections 13, 23, and 24, Township 26 South, Range 37 East, NMPM,
Lea County, New Mexico.

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

(4) That the proposed waterflood project should result in
the recovery of otherwise unrecoverable oil, thereby preventing
waste.

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CASE No. 3770
Order No. R-3421

(5) That the subject application should be approved and the project should be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

IT IS THEREFORE ORDERED:

(1) That the applicant, Texas Pacific Oil Company, is hereby authorized to institute a waterflood project in the South Leonard (Queen) Unit Area, South Leonard-Queen Pool, by the injection of water into the Queen formation through the following-described wells in Township 26 South, Range 37 East, NMPM, Lea County, New Mexico:

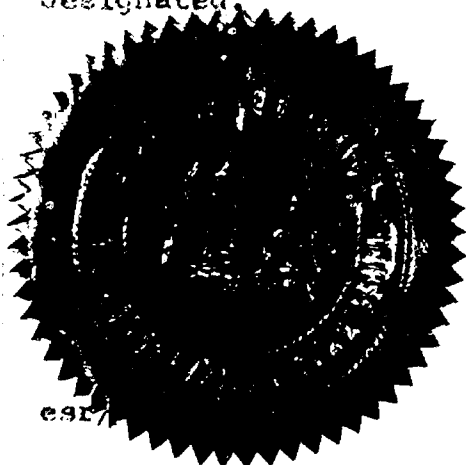
COMPANY	LEASE	WELL NO.	UNIT	SECTION
Tenneco	Parker Federal	4	N	13
Tenneco	Parker Federal	1	A	23
Shell	Scarborough	5	I	23
Texas Pacific				
Oil Company	Dublin-Federal	4	N	24
Unit	Dublin-Federal			
	(to be drilled)	10	H	24

(2) That the subject waterflood project is hereby designated the TP South Leonard Queen Waterflood Project and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

(3) That monthly progress reports of the waterflood project herein authorized shall be submitted to the Commission in accordance with Rules 704 and 1120 of the Commission Rules and Regulations.

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

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



STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

DAVID F. CARGO, Chairman

CURTIS B. HAYS, Member

A. L. PORTER, Jr., Member & Secretary

State of New Mexico
Oil Conservation Commission



STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

May 29, 1968

Re: Case No. 3770
Order No. R-3421
Applicant:

Texas Pacific Oil Company

Enclosed herewith is a copy of the above-referenced Commission order recently entered in the subject case. Letter pertaining to conditions of approval and maximum allowable to follow.

A. L. PORTER, Jr.
Secretary-Director

Hobbs OCC x
 Artesia OCC
 Aztec OCC
 State Engineer x

Other _____

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

June 4, 1968

Mr. John Russell
Attorney at Law
Post Office Drawer 640
Roswell, New Mexico 88201

Dear Sir:

Reference is made to Commission Order No. R-3421, recently entered in Case No. 3770, approving the TP South Leonard Queen Waterflood Project.

Injection is to be through the five authorized water injection wells, each of which shall be equipped with a string of plastic- or cement-coated tubing set in a packer which shall be located within 100 feet of the casing shoe in open-hole completions, or within 100 feet of the uppermost perforations, whichever is applicable.

As to allowable, our calculations indicate that when all of the authorized injection wells have been placed on active injection, the maximum allowable which this project will be eligible to receive under the provisions of Rule 701-E-3 is 672 barrels per day when the Southeast New Mexico normal unit allowable is 42 barrels per day or less.

Please report any error in this calculated maximum allowable immediately, both to the Santa Fe office of the Commission and the appropriate district proration office.

In order that the allowable assigned to the project may be kept current, and in order that the operator may fully benefit from the allowable provisions of Rule 701, it behooves him to promptly

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

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Mr. John Russell
Attorney at Law
Post Office Drawer 640
Roswell, New Mexico 88201

June 4, 1968

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notify both of the aforementioned Commission offices by letter of any change in the status of wells in the project area, i.e., when active injection commences, when additional injection or producing wells are drilled, when additional wells are acquired through purchase or unitization, when wells have received a response to water injection, etc.

Your cooperation in keeping the Commission so informed as to the status of the project and the wells therein will be appreciated.

P
Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

Y
ALP/DSH/ir

cc: Oil Conservation Commission
Post Office Box 1980
Hobbs, New Mexico

U. S. Geological Survey
Hobbs, New Mexico

Mr. D. E. Gray
State Engineer Office
Santa Fe, New Mexico

LAW OFFICES OF
JOHN F. RUSSELL
SUITE 1010 SECURITY-NATIONAL BANK BUILDING
P. O. DRAWER 640
ROSWELL, NEW MEXICO 88201

412 Hinkle Bldg.

TELEPHONE 622-4641
AREA CODE 505

May 6, 1968

Mr. A. L. Porter, Jr.
Secretary-Director
Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Dear Mr. Porter:

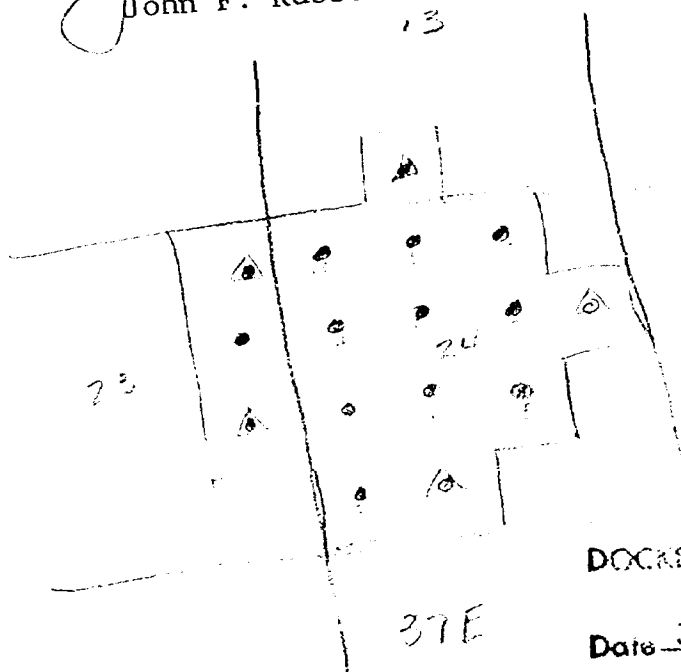
I transmit herewith the application of Texas Pacific
Oil Company for a waterflood project in its South Leonard
(Queen) Unit, which, I understand, is set for hearing on
May 22.

Thanking you for your assistance in this matter, I
remain

Very truly yours,

John F. Russell
John F. Russell
13

JFR:1
Enclosure



DOCKET MAILED

Date 5-9-68

PLEASE NOTE THAT THIS HEARING WILL START AT 8 O'CLOCK A.M.

Docket No. 16-68

DOCKET: EXAMINER HEARING - WEDNESDAY - MAY 22, 1968

8 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING - SANTA FE, NEW MEXICO

The following cases will be heard before Daniel S. Nutter, Examiner,
or Elvis A. Utz, Alternate Examiner:

- CASE 3769: Application of Texas Pacific Oil Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the South Leonard (Queen) Unit Area comprising 640 acres, more or less, of Federal and Fee lands in Township 26 South, Range 37 East, Lea County, New Mexico.
- CASE 3770: Application of Texas Pacific Oil Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in its South Leonard (Queen) Unit Area by the injection of water into the Queen formation through five wells located in Sections 13, 23, and 24, Township 26 South, Range 37 East, South Leonard-Queen Pool, Lea County, New Mexico.
- CASE 3751: (Continued and readvertised from the April 24, 1968, Examiner Hearing):
- Application of Pennzoil Company for a dual completion, tubing exception, and a non-standard gas well location or non-standard gas proration unit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the dual completion (conventional) of its Hudson Federal 29 Well No. 1 located 660 feet from the North line and 1980 feet from the East line of Section 29, Township 18 South, Range 33 East, South Corbin Field, Lea County, New Mexico, in such a manner as to produce oil from the Wolfcamp formation through 1.38-inch ID

CASE 3751 CONTINUED FROM PAGE -1-

tubing and gas from the Morrow formation through 2-inch tubing. Applicant also seeks an exception to the tubing requirements of Commission Rule 107 in that said 1.38-inch tubing would be set more than 250 feet above the uppermost Wolfcamp perforation. Applicant further seeks approval for the non-standard location for said well in the South Corbin-Morrow Gas Pool if the E/2 of said Section 29 is dedicated to the well as proposed, or in the alternative, applicant seeks approval for a non-standard gas proration unit for the well comprising the E/2 NW/4 and the NE/4 of said Section 29.

CASE 3771: Application of Pennzoil Company for special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the promulgation of special pool rules for the South Corbin-Wolfcamp Oil Pool, Lea County, New Mexico, including a provision for 160-acre spacing and proration units.

CASE 3772: Application of George L. Buckles Company for three waterflood projects, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute three waterflood projects by the injection of water into the Queen Sand of the Langlie-Mattix Pool in Township 25 South, Range 37 East, Lea County, New Mexico, as follows:

A waterflood project comprising all of Section 3 and the E/2 NE/4 and NE/4 SE/4 of Section 4, with injection to be through eight wells located in Units A, F, J, L, M, O, & P of Section 3, and Unit H of Section 4;

A waterflood project comprising the S/2 S/2 of Section 10, the W/2 SW/4 of Section 11, the W/2 NW/4 of Section 14, and the NE/4 and NE/4 NW/4 of Section 15, with injection to be through ten wells located in Units M & O of Section 10, Unit M of Section 11, Unit D of Section 14, and Units A, B, C, G, and H of Section 15.

A waterflood project comprising the NE/4 of Section 22, with injection to be through three wells located in Units B, G, and H of Section 22;

Numerous of the above-described water injection wells are proposed to be located at unorthodox locations, often 5 to 15 feet from the corners and/or boundaries of their respective 40-acre tracts.

- CASE 3773: Application of Mabee Royalties, Inc., and Yuronka and Chandler, for an amendment to Orders Nos. R-3263 and R-3388, Lea County, New Mexico. Applicants, in the above-styled cause, seek the amendment of Orders Nos. R-3263 and R-3388 to designate Mabee Royalties, Inc., as operators of the S/2 SW/4 and NE/4 SW/4 of Section 7, Township 22 South, Range 38 East, Lea County, New Mexico, rather than John Yuronka and Robert E. Chandler, who were originally designated as operators of said compulsorily pooled lands.
- CASE 3774: Application of Ernest A. Hanson for a dual completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the dual completion (conventional) of his Max Gutman Well No. 5 located in Unit N of Section 19, Township 22 South, Range 38 East, Lea County, New Mexico, in such a manner as to permit the production of Drinkard and East Brunson-Granite Wash oil through parallel strings of tubing.
- CASE 3775: Application of Cities Service Oil Company for an unorthodox oil well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to drill its State "AE" Well No. 2-Y at an unorthodox location 1420 feet from the South line and 990 feet from the West line of Section 36, Township 16 South, Range 36 East, Lovington-Abo Pool, Lea County, New Mexico. Said well will be bottomed no closer than 1420 feet to the South line nor farther than 990 feet from the West line of said Section 36, and will be drilled as a replacement for applicant's State "AE" Well No. 2 on the same 40-acre tract, which well must be abandoned due to a casing failure.
- CASE 3776: Application of J. M. Huber Corporation for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Union-State Unit Area comprising 1360 acres, more or less, of State lands in Township 15 South, Range 32 East, Lea County, New Mexico.

CASE 3701 (Reopened):

In the matter of Case No. 3701 being reopened at the request of Coastal States Gas Producing Company to consider the amendment of the special pool rules for the Farm-Wolfcamp Pool, Lea County, New Mexico, to provide for 160-acre spacing and proration units with the assignment of 80-acre allowables.

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF)
TEXAS PACIFIC OIL COMPANY FOR AN)
ORDER AUTHORIZING IT TO COMMENCE A)
WATERFLOOD PROJECT ON ITS SOUTH)
LEONARD (QUEEN) UNIT, CONSISTING OF)
PARTS OF SECTIONS 13, 23, AND 24 OF)
TOWNSHIP 26 SOUTH, RANGE 37 EAST,)
N.M.P.M., LEA COUNTY, NEW MEXICO,)
IN THE SOUTH LEONARD (QUEEN) POOL,)
BY THE INJECTION OF WATER INTO THE)
QUEEN FORMATION THROUGH FIVE (5))
WELLS LOCATED IN SECTIONS 13, 23,)
AND 24 OF TOWNSHIP 26 SOUTH, RANGE)
37 EAST, N.M.P.M., LEA COUNTY,)
NEW MEXICO.)

No. _____

Case 3-110

MAY 7 AM 8 31

APPLICATION

COMES NOW Texas Pacific Oil Company, a Division of
Joseph E. Seagram & Sons, Inc., by its attorney, John F.
Russell, and states:

1. It is the operator of the South Leonard (Queen)
Unit, consisting of the $SE\frac{1}{4}SW\frac{1}{4}$ of Section 13, the $E\frac{1}{2}NE\frac{1}{4}$ and
 $NE\frac{1}{4}SE\frac{1}{4}$ of Section 23, and the $W\frac{1}{2}$, $NW\frac{1}{4}NE\frac{1}{4}$, $S\frac{1}{2}NE\frac{1}{4}$ and $NW\frac{1}{4}SE\frac{1}{4}$ of
Section 24, all in Township 26 South, Range 37 East, N.M.P.M.,
Lea County, New Mexico.
2. It proposes to institute a peripheral waterflood
project for the secondary recovery of oil and gas on said unit,
and attached hereto is a plat marked "Exhibit A" showing the
location of the five (5) proposed injection wells, the location

DOCKET MAILED

Date 5-9-68

of all other wells within the radius of two (2) miles from said injection wells, and the location of the proposed water production well.

3. Applicant, at the hearing, will present all available logs covering the injection wells.

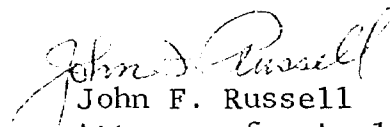
4. Diagramatic sketches of the proposed injection wells are attached hereto and marked "Exhibit B."

5. Applicant proposes to inject water into the Queen formation at an estimated volume of approximately five hundred (500) barrels of water per day at a pressure of 1,800 psig.

6. The water for injection purposes will be obtained from the San Andres formation from the Tenneco Oil Company Joe Champlin No. 1 Federal Leonard Well located in the SW $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 13, Township 26 South, Range 37 East, N.M.P.M.

WHEREFORE, Applicant requests the Commission to set this matter down for hearing before an examiner, to publish its notice as provided by law, and, after hearing, to issue its order authorizing the waterflood project as requested in the application.

Respectfully submitted,


John F. Russell
Attorney for Applicant

P. O. Drawer 640
Roswell, New Mexico 88201

dearnley-meier reporting service, inc.

SPECIALIZING IN: DEPOSITIONS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTION.

1120 SIMMAS BLDG. • P. O. BOX 1092 • PHONE 243-4491 • ALBUQUERQUE, NEW MEXICO

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
May 22, 1968

EXAMINER HEARING

IN THE MATTER OF:

Application of Texas Pacific
Oil Company for a unit agreement,
Lea County, New Mexico.

Case No. 3769

Application of Texas Pacific
Oil Company for a waterflood
project, Lea County, New Mexico.

Case No. 3770

BEFORE: Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

MR. NUTTER: The hearing will come to order, please.
The first case this morning will be Case 3769.

MR. HATCH: Case 3769. Application of Texas Pacific Oil Company for a unit agreement, Lea County, New Mexico. And Case 3770. Application of Texas Pacific Oil Company for a waterflood project, Lea County, New Mexico.

MR. RUSSELL: John F. Russell, appearing on behalf of the applicant. I am from Roswell, New Mexico, and I have one witness.

(Witness sworn.)

(Whereupon, Exhibits 1, 1-a & 2 through 9 were marked for identification.)

JERRY I. MORITZ

called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. RUSSELL:

Q Please state your name, address and by whom you are employed.

A My name is Jerry Moritz, M-o-r-i-t-z, and I am an area engineer for the Texas Pacific Oil Company, Midland, Texas.

Q You have previously qualified to give testimony before this Examiner, have you not?

A Yes, I have.

Q Are you familiar with the application of Texas Pacific Oil Company in these two cases?

A Yes.

Q And it asks for an approval of your South Leonard Unit Agreement and also for a secondary recovery project in this unit, is that correct?

A Yes.

Q I refer you to what has been marked as Exhibit 1 and ask you what that is.

A This is the Unit Agreement for the South Leonard Unit, Lea County, New Mexico.

Q And what type of lands are included in there?

A There is only fee and federal acreage.

Q Has the United States Geological Survey given you preliminary approval of your Unit Agreement?

A Yes.

Q And that letter is Exhibit 1-a, which is in the folder, is it not?

A Yes.

Q Have all the working interest owners and royalty interest owners executed this agreement?

A Yes.

Q Going to the folder which contains the exhibits, the first map, which is Exhibit No. 2, will you explain that?

A This is a map of the area surrounding the South Leonard Unit showing the wells to be included in the unit, and the different colors are designating the different tracts, with all of them being federal except for the purple one, which is Shell's.

Q These tract numbers are the same designations as are in the Unit Agreement, is that correct?

A Yes.

Q Go to Exhibit No. 3.

A Exhibit No. 3 is a structure map contoured on the K marker, which is near the top of the Queen. It shows the five proposed injection wells, one of which is to be drilled. It shows the water supply well which is in the Southwest Quarter of the Northwest Quarter of Section 13.

Q That's the square with the blue?

A The square with the blue in it.

Q And your injection wells, which are existing wells, are colored in red?

A Right.

Q And the one which is to be drilled, will you locate that for the Examiner?

A The well to be drilled is in the Southeast Quarter of the Northeast Quarter of Section 24 and is designated as Unit Well No. 10.

MR. NUTTER: What is the footage location of that well, Mr. Moritz?

THE WITNESS: It is to be 1980 from the north line and 990 from the east line of Section 24.

Q (By Mr. Russell) Is there anything further on Exhibit 3 that you want to bring out?

A No, I don't believe so at this time.

Q Go to Exhibit No. 4. Explain what that is.

A Exhibit No. 4 is a cross section, a north-south cross section through the unit showing the logs that are available on the producing wells. It has the top of the unitized interval as explained in the Unit Agreement and the bottom of the unit interval; the K marker is shown here, it is depicting the continuity of the pay through the interval and I believe that's about all.

Q Now, the last well to the right, is that the water production well or not?

A No. The one to the left is.

Q The one on the left is your water production well?

A Yes.

Q Was that a dry hole?

A Yes, it was.

Q Now, go to your Exhibit No. 5 and briefly tell what that is.

A Exhibit No. 5 is a monthly tabulation of the unit production starting in 1960, of oil, water and gas, and bringing it up to the present of showing the cumulative to 3-1-68 of 596,738 barrels of oil. This would figure out to be an average production of 4.9 barrels of oil per well per day plus 1.5 barrels of water, and a gas-oil ratio of 3,071.

Q All of the wells are in the stripper stage?

A Yes.

Q How many producing wells are in the unit at this time?

A There are fifteen producing wells, there's only eleven producing presently.

Q But originally there were fifteen and presently there are eleven?

A Right.

Q Are any of the wells which are no longer producing, are they to be injection wells?

A Yes, two of them are. We plan to put the other temporarily abandoned ones back on production.

Q When the flood is in operation?

A Yes.

Q Now, go to Exhibit No. 7 and explain what that is.

A Exhibit No. 7 is a tabulation of the available reservoir data that we have been able to assemble and estimate within reasonable accuracy for this unit.

Q What is the formation which is included within the unit and to be flooded?

A It is to be the Queen.

Q Now, what percent of primary do you feel that has been recovered from the unit at this time?

A At this time I think it has been estimated to be 98 percent.

Q How much additional oil do you anticipate that the secondary recovery will produce?

A 610,000 barrels.

Q As to your water source for the flood project, where is that to come from?

A It is to come from the water source well that I pointed out on Exhibit 3, which will be from the San Andres at approximately 4,000 feet.

Q Now, that is fresh water or non-potable water?

A It is non-potable water.

Q And you have advertised your intent to appropriate as required by the statute, and you have received acknowledgment of following the statute from the State Engineer?

A Yes.

Q What quantities and what rates do you anticipate injecting this water?

A We expect to inject 500 barrels of water per well per day at an expected pressure of 1800 pounds. This will be a total of 2500 barrels for the unit.

Q Now, go to Exhibit No. 8, this is a diagrammatic sketch of your injection wells and the manner in which you intend to complete them, is that correct?

A Yes.

Q Will you explain this exhibit and also point out what is being done to insure that not any of this water will get back into any fresh water supply that may exist in this area?

A This exhibit shows the five injection wells and the various casing strings involved. The last one to the right is the proposed drilling well. In each case there is either surface casing protecting the fresh water or with cement circulated back to surface, or there is an intermediate string, again protecting it with cement back up to the surface, or part

of the way up. We plan to run plastic-coated tubing on a packer and set near the casing shoe. We plan to fill the casing annulus with an inhibited fluid and are planning to install pressure valves on the annulus so that we can constantly survey this pressure.

Q That will determine whether or not there may be some leaks, is that correct?

A Right.

Q Now, the water is being injected in the same formations from which these wells have produced, is that correct?

A Yes.

Q Is there anything else on Exhibit No. 8 that you want to comment on?

A No, I don't believe so.

Q Go to Exhibit No. 9 and explain what that exhibit is.

A Exhibit 9 is just a quick reference tabulation of the five injection wells with the size casings, where they have been set, the tubing linings and where we plan to inject, and showing that we are planning to inject through tubing in all cases.

Q You have not as yet received final approval from the United States Geological Survey, have you?

A No.

Q And you would not commence operations until that had been obtained?

A Right.

Q But under the terms, original terms of the Unit Agreement, this was to be started on or before June 1st of '68, is that correct?

A Right.

Q And you have received extensions from all parties for an additional six months from that date to be able to get final approval, is that correct?

A Yes.

MR. RUSSELL: At this time I would like to offer in- to evidence applicant's Exhibits 1, 1-a and 2 through 9.

MR. NUTTER: If no objections, applicant's Exhibits 1, 1-a and 2 through 9 will be admitted in evidence.

(Whereupon, Exhibits 1, 1-a and 2 through 9 were offered and admitted in evidence.)

MR. RUSSELL: I have no further questions of this witness.

MR. NUTTER: Does anyone have any questions they wish to ask of Mr. Moritz?

CROSS EXAMINATION

BY MR. NUTTER:

Q I notice on your diagrammatic sketches of the

injection wells, of the existing four wells, three of them are equipped with surface pipe and an intermediate string. The intermediate string has been set from eleven to twelve hundred feet, right?

A Yes.

Q The fourth well does not have the intermediate, but a staging tool was set at 1241 feet and cement circulated to the surface on that well?

A Yes.

Q And this fifth well to the right is the one that's proposed to drill and you will run a long surface string there to approximately 1150 feet and cement to the surface on that pipe?

A Right. We feel that we can accomplish this easily.

Q Each of the injection wells is to be equipped with a packer?

A Yes.

Q This tubing, will it be plastic-coated?

A Yes.

Q The tubing will be set in the packer and the packers will be down near the shoe or immediately above the perforations?

A Right.

Q And the annulus loaded with inhibited fluid and

equipped with a gauge?

A Right.

Q This type of casing and cementing program is, in your opinion, adequate to protect the fresh waters in this area?

A Yes.

Q What is the approximate depth of the fresh water here?

A I would say running from about 120 to possibly 350.

Q The water supply is San Andres and would be non-potable?

A Right, at about 4,000 feet.

MR. NUTTER: Are there any further questions of Mr. Moritz? Mr. Russell, did you have someone to testify as to the unit, itself, or is Mr. Moritz familiar with the terms of the unit?

MR. RUSSELL: Are you familiar with the terms of the unit, itself?

MR. FREELS: I am familiar with it.

MR. NUTTER: We will swear Mr. Freels and have him testify about it.

(Witness excused.)

(Witness sworn.)

RON FREELS

called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. NUTTER:

Q Mr. Freels, now as to the Unit Agreement, what percentage of the working interest has signed the Unit Agreement?

A One hundred percent.

Q One hundred percent of what?

A And one hundred percent of the royalty interest, with the understanding that the United States Geological Survey has given preliminary approval.

Q What are the provisions in the Unit Agreement for the participation of the various tracts?

A Participation is based -- Let me read this to you. It is based on production. I wanted to read the exact terms, if I could, to you. It's based on the ultimate recovery from tracts.

Q It's on page 10, I believe?

A Yes. Percentages of tract participation as set out in Exhibit "B" are based on the ultimate primary recovery of the tract plus five percent surface acres -- I am sorry,

I was in error on that five percent surface acres, and ninety-five percent ultimate recovery.

Q When is it expected that ultimate primary will have been achieved?

A Very shortly. We feel that we have recovered eighty percent of the ultimate primary recovery as of now.

Q Does it have a cutoff date?

A No. It is a one-phase operation on this, we have.

Q Ninety-five percent of the participation is based on that, five percent is on straight acreage?

A Right.

MR. NUTTER: I believe that's all. Does anyone else have a question of Mr. Freels?

MR. SMITH: Do they have a permit for that San Andres water from the State Engineer?

MR. NUTTER: They said the permit was being processed at the present time.

MR. RUSSELL: I would like to explain that. This water is below 2500 feet, is not potable water, is not within the jurisdiction of the State Engineer, and therefore, no permit can be issued by the State Engineer to appropriate it. Under the statute we have to file a Notice of Intent with the State Engineer showing where the well will be, the depth

and so forth; advertise that Notice of Intent in the Lea County paper, and then when it is completed, file a copy of that, Proof of Publication with the State Engineer. They merely advise us that they have received it and prior to commencing any work on the well, to have the well driller contact them. But there is no permit.

MR. NUTTER: This is in the process of the Notice being let and all that?

MR. RUSSELL: It has been completed.

MR. SMITH: You have free access to that water, is that right?

MR. RUSSELL: Yes.

MR. NUTTER: Are there any other questions of Mr. Freels? He may be excused.

(Witness excused.)

MR. RUSSELL: I have nothing further to offer.

MR. NUTTER: Does anyone have anything they wish to offer in Case 3769 or 3770? We will take the case under advisement.

I N D E X

<u>WITNESS</u>		<u>PAGE</u>
JERRY I. MORITZ		
Direct Examination by Mr. Russell		2
Cross Examination by Mr. Nutter		10
 RON FREELS		
Direct Examination by Mr. Nutter		13
 <u>EXHIBITS</u>	<u>MARKED</u>	<u>OFFERED AND ADMITTED</u>
Exhibits 1, 1-a, 2 through 9	2	10

STATE OF NEW MEXICO)
) ss
 COUNTY OF BERNALILLO)

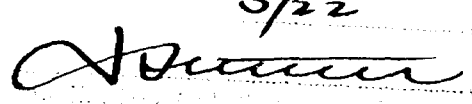
I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me; and that the same is a true and correct record of the said proceedings, to the best of my knowledge, skill and ability.

Witness my Hand and Seal this 10th day of June, 1968.


 NOTARY PUBLIC

My Commission Expires:

June 19, 1971.

I do hereby certify that the foregoing is
 a true and correct record of the proceedings
 before the New Mexico Oil Conservation Commission
 5/22 37693770
 68

 Notary Public, State of New Mexico

TEXAS PACIFIC OIL COMPANY
APPLICATION FOR
APPROVAL OF UNITIZATION
AND
SUPPLEMENTAL RECOVERY PROJECT
SOUTH LEONARD (QUEEN) UNIT

SOUTH LEONARD (QUEEN) FIELD
LEA COUNTY, NEW MEXICO
MAY, 1968

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RECOMMENDATIONS

Texas Pacific Oil Company, acting on its own behalf and as operator of the proposed South Leonard (Queen) Unit, South Leonard (Queen) Field, Lea County, New Mexico, respectfully submits this brochure in support of its request for the following items:

1. Approval of the South Leonard (Queen) Unit Agreement.
2. Approval of the supplemental recovery program and permission to convert the following wells to injection:
 - (a) Tenneco Oil Company
Parker-Federal Well No. 4 - Unit No. 1
Parker-Federal Well No. 1 - Unit No. 2
 - (b) Texas Pacific Oil Company
Dublin Well No. 4 - Unit No. 16
 - (c) Shell Oil Company
Scarborough Well No. 6 - Unit No. 11
 - (d) Drill Unit Injection Well No. 10 located in Unit H, Section 24
3. Approval to expand the project and convert additional wells to injection without the necessity of a hearing.
4. Approval of a unit allowable which will provide greater flexibility, permit more efficient operations and improve the oil recovery.

The formation of the South Leonard (Queen) Unit and the proposed operating regulations are considered necessary in order to provide for the equitable division of interests, protect the correlative rights of all concerned and permit the effective and efficient depletion of the reservoir through supplemental recovery operations .

GENERAL DISCUSSION

The South Leonard Queen Field was discovered in February, 1950, and has been developed with 16 wells. The discovery well was Shell's (Plains Production) Scarborough No. 1. Production is from the Permian (Queen) sand found at an average depth of 3,350 ft. This accumulation lies on the western edge of the Central Basin Platform and is located on the nose of a plunging anticline. The lateral limits of production are controlled primarily by porosity and permeability development.

Production performance indicates that solution gas is the primary driving mechanism. The crude was originally saturated and a small gas cap occupied the northern part of the field. Original reservoir pressure is unknown, but the present pressure is estimated at about 50 psi.

The Queen sand has proven amenable to waterflooding and there are several successful floods currently in operation in southeastern Lea County. An excellent example of a very successful Queen waterflood is Amerada's Langlie Mattix Woolworth Unit about 10 miles north of South Leonard. Individual well response in excess of 300 BOPD has occurred.

UNITIZED AREA

The proposed unit will encompass 640 acres all within the productive area of the South Leonard (Queen) Field. Location of the unit relative to other fields is shown in Exhibit No. 2. Exhibit No. 3 is a contour map of the structure with well completion data. Exhibit No. 4 is a cross-section showing the continuity of the pay and the unitized interval.

The unit is presently developed with 15 oil wells which, to March 1, 1968, had produced 596,738 barrels of oil or approximately 98% of the estimated ultimate primary recovery of 610,000 barrels. Production from the unit area currently averages 4.9 barrels of oil plus 1.5 barrels of water per day per well with a gas-oil ratio of 3071 cubic feet per barrel. Production performance for the unit is shown statistically in Exhibit No. 5 and graphically in Exhibit No. 6. Additional reservoir data is contained in Exhibit No. 7.

An executed copy of the Unit Agreement, marked Exhibit 1, is included as an attachment to this brochure. Exhibit 1-A is a letter from the United States Department of Interior granting preliminary approval of the unit area.

PLAN OF INJECTION

Texas Pacific Oil Company proposed to institute a water injection supplemental recovery program utilizing a peripheral injection pattern. Under this plan, four existing producers will be converted to injection and one new injection well will be drilled. Exhibits No. 2 and No. 3 show the proposed production and injection wells. If additional points of injection are required, the proposed pattern can be altered at a latter date to a modified five-spot pattern. Injection will be limited to 500 barrels of water per day per well at a maximum surface pressure of 1800 psig. Each well will be equipped with internally coated tubing and a packer to insure that injection is confined to the unit interval. The tubing-casing annulus will be loaded with inhibited fluid and the casinghead will be equipped to detect pressure increases should a tubing leak occur. Data regarding the tubing and casing in each injection well is shown schematically in Exhibit No. 8 and is tabulated in Exhibit No. 9.

WATER SOURCE

It is planned to develop and use non-potable water from the San Andres formation underlying this area. We plan to recompleate the dry and abandoned Tenneco-Champlin No. 1 Federal Leonard well in the San Andres formation between the intervals 3900 ft. to 4400 ft. This well is located in the SW/4 NW/4 of Section 13, Township 26 South, Range 37 East, N.M.P.M., Lea County, New Mexico. Exhibits No. 2 and No. 3 show the location of this well with respect to the unit.

Proper notice to appropriate this water for injection was published in "The Lovington Daily Leader" newspaper and an application was filed with the State Engineer. There were no protests to our application. We expect this water source will be more than adequate to meet our anticipated maximum requirements of 2500 barrels per day.

ADDITIONAL RECOVERY AND COSTS

It is estimated that the proposed supplemental recovery program will require an ultimate capital investment of approximately \$255,000 and will result in the recovery of 610,000 additional barrels of oil that would not otherwise be recovered.



EXHIBIT 1-A
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON, D.C. 20242

MAY 25 1967

Texas-Pacific Oil Company
P. O. Box 747
Dallas, Texas 75221

Attention: Dr. Norman Lamont

Gentlemen:

Your application of February 27, 1967, filed with the Oil and Gas Supervisor, Roswell, New Mexico, requests the designation of the South Leonard (Queen) unit area embracing 640 acres in Lea County, New Mexico, as logically subject to operation under the unitization provisions of the Mineral Leasing Act, as amended. The proposed unit area is comprised of 400 acres (62.5 percent) of Federal lands and 240 acres (37.5 percent) of fee lands.

Unitization is for the purpose of conducting secondary recovery operations by waterflooding and will be limited to the Queen formation as defined in Section 2(f) of the unit agreement. The area has been developed by 15 wells completed in the formation to be unitized. Participation in unitized substances is based 95 percent on ultimate primary recovery and 5 percent on productive acres. You estimate that the proposed waterflood project will result in the recovery of 582,000 barrels of oil over and above that recoverable by primary methods.

The land outlined on your plat marked "Exhibit A, South Leonard (Queen) unit, Lea County, New Mexico" is acceptable as a logical unit area for secondary recovery operations. Your proposed form of unit agreement which modifies the standard Federal form (1961 reprint) to the extent necessary to cover conditions incidental to secondary recovery operations in a producing unit will be acceptable if further modified as marked in colored pencil and/or by attached riders. One copy of the marked form is returned herewith and the remaining copies are retained for distribution to the appropriate offices of the Geological Survey.

In the absence of any type of land requiring special provisions or any objections not now apparent, a duly executed agreement conformed to the marked copy will be approved if submitted in approvable status within a

reasonable period of time. However, the right is reserved to deny approval of any executed agreement that, in our opinion, does not have the full commitment of sufficient lands to afford effective control of secondary recovery operations.

Please include the latest status of all acreage when the executed agreement is submitted for final approval.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "William P. Butler".

Acting Director

EXHIBIT NO. 5
SOUTH LEONARD (QUEEN) UNIT
Lea County, New Mexico

		P R O D U C T I O N		
Year	Month	Oil Barrels	Water Barrels	Gas MCF's
1-1-60	Cumulative	452,102	6,451	107,370
1960	January	1,172	403	5,947
	February	848	377	6,042
	March	1,292	428	7,108
	April	1,116	411	6,973
	May	731	417	6,651
	June	992	414	7,781
	July	910	426	6,368
	August	1,528	432	8,236
	September	1,342	401	7,718
	October	1,431	433	8,431
	November	1,372	419	7,501
	December	1,214	432	6,414
1961	January	1,142	291	7,482
	February	1,046	202	6,806
	March	1,106	204	7,780
	April	611	211	7,146
	May	902	104	7,109
	June	343	131	4,679
	July	299	102	5,358
	August	379	170	4,951
	September	213	297	4,240
	October	445	321	5,271
	November	518	319	3,014
	December	553	346	6,491
1962	January	290	214	6,305
	February	189	174	4,923
	March	1,209	504	7,083
	April	933	570	9,535
	May	994	609	8,930
	June	1,201	489	8,248
	July	2,493	834	8,522
	August	2,397	793	9,894
	September	1,811	941	10,485
	October	1,646	702	14,287
	November	2,614	493	9,892
	December	2,447	466	9,627
1963	January	2,127	850	9,588
	February	2,319	727	9,438
	March	2,698	937	11,354
	April	2,378	350	21,155
	May	3,380	339	22,230
	June	2,906	315	20,472
	July	2,469	349	17,799
	August	2,512	357	16,744
	September	1,831	345	12,313
	October	2,906	958	16,993
	November	3,173	1,394	20,957
	December	2,769	1,621	16,087
1964	January	3,001	1,909	14,536
	February	2,415	1,730	12,770
	March	2,893	1,555	14,882
	April	2,224	3,279	13,500
	May	2,200	2,875	13,798
	June	1,698	4,331	12,135
	July	1,769	4,386	11,119
	August	1,513	4,360	9,550
	September	1,894	3,129	8,708
	October	1,543	3,049	7,937
	November	1,704	3,061	9,386
	December	1,763	2,859	8,958

4.9 BOPD
per well

~~15.5 B~~

P R O D U C T I O N				
Year		Oil Barrels	Water Barrels	Gas MCF's
1965	January	1,790	3,075	9,160
	February	1,321	2,034	9,037
	March	1,811	1,386	7,754
	April	1,240	1,461	9,039
	May	1,701	1,462	9,790
	June	1,412	1,492	10,297
	July	1,145	1,524	10,815
	August	1,190	1,452	10,222
	September	1,589	1,395	9,297
	October	1,521	1,870	7,950
	November	1,535	1,905	8,379
	December	1,602	1,895	8,365
1966	January	1,798	1,898	6,201
	February	1,425	1,573	5,169
	March	1,520	2,007	6,334
	April	1,024	1,795	5,636
	May	1,257	1,883	6,377
	June	983	1,859	6,196
	July	1,158	1,281	6,728
	August	1,099	1,249	6,225
	September	1,162	1,229	5,896
	October	1,250	1,067	6,114
	November	1,194	1,086	5,591
	December	1,006	976	5,349
1967	January	847	1,221	4,888
	February	815	1,133	4,753
	March	838	1,143	5,212
	April	808	968	5,641
	May	1,111	1,072	5,158
	June	1,167	862	4,964
	July	1,228	1,240	5,673
	August	1,330	1,831	5,095
	September	1,134	959	4,632
	October	1,417	1,013	4,741
	November	1,382	967	4,201
	December	1,633	1,040	4,641
1968	January	1,338	1,151	4,454
	February	1,041	1,002	3,224
3-1-68 Cumulative		596,738	119,301	952,205

EXHIBIT NO. 7
RESERVOIR DATA

Field South Leonard County Lea District Hobbs

Operator Texas Pacific Oil Co. Date April 29, 1968

Address P. O. Box 747, Dallas, Texas 75221

Lease (s) & Number (s) South Leonard Unit

Reservoir Queen Discovery Date February, 1950

Have any injection permits been granted previously in this reservoir? No

I. Reservoir and fluid characteristics

A. Information on entire reservoir

1. Name of formation Queen
2. Estimated productive area of entire reservoir 640
3. Composition (sand, limestone, dolomite, etc.) Sand
4. Type of structure Nose on a plunging anticline
(Include cross-section and structural maps)
5. Subsea depth of oil-water contact Unknown Gas-oil contact
6. Type drive during primary production Solution gas
7. Original BHP Unknown Current BHP 50 psia
8. Was gas cap present originally? Yes At present? Yes
9. Ratio of gas cap volume to oil zone volume Unknown
10. Saturation pressure Unknown Formation Volume Factor 1.216 est.

B. Information on proposed project area

1. Number of productive acres in lease (s) within project area 640
2. Average depth to top of pay 3350
3. Average effective pay thickness (feet) 15
4. Average porosity (%) 14
5. Average horizontal permeability (mds.) Unknown Range Unknown
6. Connate water content (% of pore space) 35
7. Gravity of oil (API) 39 Viscosity Unknown

II. Primary Production history

1. Date first well completed on lease (s) February, 1950
2. Oil, gas, water production by months since discovery. (Graphically as well as in tabular form.)
3. Stage of depletion of project area 98%
4. Number of producing wells on each lease in project area 15
5. Average daily oil production per well at present time 4.9 barrels
6. Average gas-oil ratio 3071 Water Production (%) 44.3
7. Cumulative oil production to date from lease (s) 596,738

III. Results expected

1. Estimated original oil in place (bbls.) 4,998,708 STB
2. Estimated oil saturation at present time (% of pore space) 51.6
3. Estimated residual oil saturation at abandonment 44.4
4. Estimated ultimate additional oil that will be recovered as a direct result of injection (bbls.) 610,000

IV. Injection

1. Type of injection fluid (water, gas, LPG) Water
2. Source of injected fluid (formation, depths) Source well (San Andres)
3. Injection pattern and spacing peripheral
4. Maximum injection pressure to be used (psi) 1800 psig
5. Estimated maximum per well rate of injection (bbls./day) 500 bbls/day

EXHIBIT NO. 9
INJECTION WELL DATA

Well Number		1	2	11	16	Proposed 10	
Surface Casing	Size	10"	10 3/4"	13 3/8"	9 5/8"	7" or 7 5/8"	
	Length	292'	200'	168'	291'	1150'	
	Sacks & Type Cement	100	75	50	125	Circulate	
Production Casing	Size	7"	7"	7"	5 1/2"	4 1/2"	
	Length	3250'	3254'	3246'	3260'	3500'	
	Sacks & Type Cement	400	75	100	Stage DV Tool 400	Circulate	
Tubing	Length	3280'	3393'	3276'	3290'	3280'	
	Packer Depth	3220'	3224'	3216'	3230'	3250'	
Injection	Depth	3250' to 3484'	3254' to 3437'	3246' to 3482'	3260' to 3480'	3250' to 3500'	
	Thru Casing or Tubing?	Tubing	Tubing	Tubing	Tubing	Tubing	

Jack Russell

DOCKET MAILED

Date _____

Texas Pacific Oil Co

water flood project

So Leonard (Queen) Unit Area

inj into Queen formation

5 injection wells Section 13

23 24 26S 37E