

CASE 3849: Application of PENROC
OIL CORPORATION FOR A WATERFLOOD
PROJECT, EDDY COUNTY, N. MEX.

Case Number

3849

Application

Transcripts.

Small Exhibits

ETC.

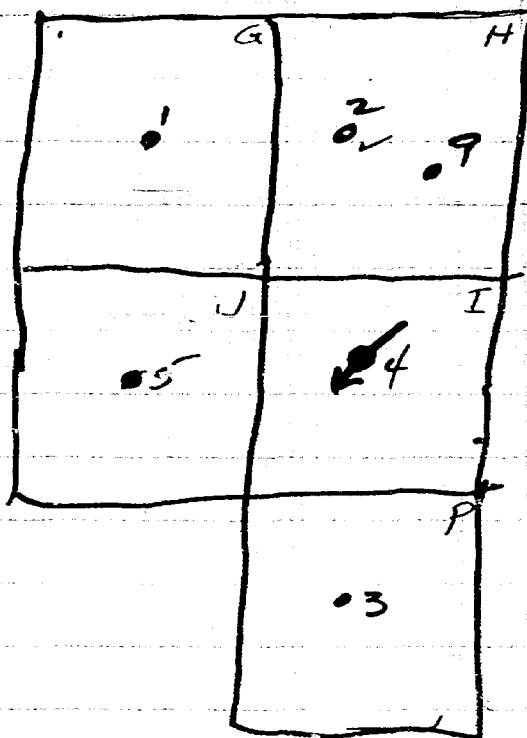
Case 3849
 Heard 9-4-68
 Rec. 9-5-68

Grant. Petroco a waterflood project & permission to convert 1 well to an injection well.

The well is their N.H. Phillips #4, 1658/S, 830/E 27-175-28E, Ed Ly. Co.

This Office. the Depo-~~ment~~ ~~the~~ Artesia Waterflood Project in Artesia Grayburg Pool.

Thos G. W. [Signature]



1 inj 40
 4 prod 40's
 5 40's
 42
 10
 20
 210
 14 1 extra
 224

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

IN THE APPLICATION OF
PENROC OIL CORPORATION
FOR A WATERFLOOD PROJECT,
EDDY COUNTY, NEW MEXICO.

No. 3849

ENTRY OF APPEARANCE

Come now Stephenson, Campbell & Olmsted and enter their appearance as attorneys
herein for the Applicant, Penroc Oil Corporation.

STEPHENSON, CAMPBELL & OLMSTED

By Larry Kennedy Jr

STEPHENSON,
CAMPBELL & OLMSTED
ATTORNEYS AT LAW
P. O. BOX 877
SANTA FE, NEW MEXICO

BEFORE THE OIL CONSERVATION COMMISSION OF THE
STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION)
OF PENROC OIL CORP. FOR)
APPROVAL OF A WATERFLOOD PROPECT)
ON ITS N.G. PHILLIPS LEASE,)
EDDY COUNTY, NEW MEXICO)

CASE NO. 3849

ORDER NO. _____

A P P L I C A T I O N

PENROC OIL CORP, a Texas corporation with an operating office in Midland, Texas, hereby makes application under Rule 70i for approval to institute a water injection operation in its N. G. Phillips lease located in S/2 NE/4, N/2 SE/4, and SE/4 SE/4 of Section 27, Township 17 South, Range 28 East, Eddy County, New Mexico, and in support thereof shows: *Artesia Pool*

1.

That Penroc Oil Corp. is the operator of its N. G. Phillips lease described above. Said lease is in an advanced stage of depletion and applicant desires to institute a secondary recovery program by waterflooding. The Grayburg formation is the zone proposed to be flooded.

2.

Attached and filed herewith is a plat showing the location of the proposed injection well and all other wells within the radius of two miles from said proposed injection well, and showing also the leasees and operators within the two-mile radius.

3.

Attached and filed herewith are the logs run on the proposed injection well.

4.

Attached hereto and filed herewith is a diagrammatic sketch of the proposed injection well showing all casing strings, including diameters and setting depths, quantities used and tops of cement, perforated or open hole intervals, tubing strings including diameters and setting depths and the type and location of packers,

Date 8/22-68

if any.

5.

Applicant proposes to inject fresh water from the Lea County Underground Water Basin acquired from Double Eagle Water Company into the Grayburg formation at a depth of 2056-2064 feet below the surface at an initial rate of 300 barrels per day.

6.

Applicant proposes that the waterflood project should be governed by the provisions of Rule 701 of the Commission's Rules and Regulations, including those provisions regarding allocation of allowables. Applicant also proposes to submit to the Commission monthly progress reports of the waterflood project in accordance with Rule 704 and Rule 1120 of the Commission's Rules and Regulations. Applicant further alleges that the granting of this application will be in the interest of prevention of waste and will not impair correlative rights.

WHEREFORE, applicant prays that the Commission set this application for public hearing before an Examiner in Santa Fe, New Mexico, that notice be issued according to law, and that upon hearing this application be granted.

PENROC OIL CORPORATION

by Donald G. Stevens
Donald G. Stevens, Agent

LOCKET: EXAMINER HEARING - WEDNESDAY - SEPTEMBER 4, 19689 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING - SANTA FE, NEW MEXICO

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

CASE 3847: (Continued from the August 21, 1968, Examiner Hearing)

Application of K. K. Amini for compulsory pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Bough "C" zone of the Pennsylvanian formation underlying the NE/4 of Section 5, Township 10 South, Range 34 East, Lea County, New Mexico. Said acreage to be dedicated to a well to be drilled in the SW/4 NE/4 of said Section 5, adjacent to the Vada-Pennsylvanian Pool.

CASE 3513: (Reopened)

In the matter of Case No. 3513 being reopened pursuant to the provisions of Order No. R-3179-A, which order established 160-acre spacing units and a 160-acre proportional factor of 4.77 for allowable purposes for the Vada-Pennsylvanian Pool, Lea County, New Mexico, for a period of one year. All interested parties may appear and show cause why the pool should not be developed on less than 160-acre spacing units and show cause why the 160-acre proportional factor of 4.77 should or should not be retained.

CASE 3849:

Application of Penroc Oil Corporation for a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project by the injection of water into the Grayburg formation through its Phillips State Well No. 4 located in Unit I of Section 27, Township 17 South, Range 28 East, Artesia Pool, Eddy County, New Mexico.

CASE 3850:

Application of Pan American Petroleum Corporation for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Bough (Permo-Pennsylvanian) formation in the interval from approximately 9590 feet to 9634 feet in its Federal "A" Well No. 3 located in Unit J of Section 13, Township 9 South, Range 35 East, Bough (Permo-Pennsylvanian) Pool, Lea County, New Mexico.

CASE 3851:

Application of Mobil Oil Corporation for a waterflood expansion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to expand its Bridges State Waterflood Project by the injection of water into the San Andres formation through an injection well recently completed at a location 660 feet from the South line and 560 feet from the West line of Section 24, Township 17 South, Range 34 East, Vacuum Pool, Lea County, New Mexico.

CASE 3852:

Application of Mobil Oil Corporation for a triple completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the triple completion (conventional) of its Bridges State Well No. 126 located in Unit J of Section 11, Township 17 South,

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. 3849
Order No. R-3494

APPLICATION OF PENROC OIL CORPORATION
FOR A WATERFLOOD PROJECT, EDDY COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on September 4, 1968, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 12th day of September, 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, Penroc Oil Corporation, seeks permission to institute a waterflood project in the Antecia Pool by the injection of water into the Grayburg formation through its Phillips State Well No. 4, located in Unit I of Section 27, Township 17 South, Range 28 East, NMPM, Eddy 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. 3849
Order No. R-3494

(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, Penroc Oil Corporation, is hereby authorized to institute a waterflood project in the Artesia Pool by the injection of water into the Grayburg formation through its Phillips State Well No. 4, located in Unit I of Section 27, Township 17 South, Range 28 East, NMPM, Eddy County, New Mexico.

(2) That the subject waterflood project is hereby designated the Penroc Phillips Artesia 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.

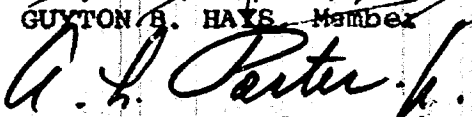
(4) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION


DAVID F. CARGO, Chairman


GUYTON B. HAYS, Member


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


esr/

State of New Mexico
Oil Conservation Commission



September 12, 1968

Re: Case No. 3849
Order No. R-3494
Applicant:
Penroc Oil Corporation

Other _____

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

September 17, 1963

Mr. Don Stevens
LeMay & Stevens
Petroleum Consultants
Post Office Box 2246
Santa Fe, New Mexico

Dear Sir:

Reference is made to Commission Order No. R-3494, recently entered in Case No. 3949, approving the Penroc Phillips-Artesia Waterflood Project.

Injection is to be through the one authorized water injection well, which shall be equipped with internally plastic-coated tubing set in a packer at approximately 2000 feet. The casing-tubing annulus shall be loaded with an inert fluid and equipped with a gauge to facilitate detection of leakage in the casing, tubing, or packer.

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 224 barrels per day when the South-east 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 notify

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

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Mr. Don Stevens
LeMay & Stevens
Petroleum Consultants
Post Office Box 2244
Santa Fe, New Mexico

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.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ALP/DSH/ir

Cc: Oil Conservation Commission Offices in Hobbs and Artesia, N.M.

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

dearnley-meier reporting service, inc.

SPECIALIZING IN: DEPOSITIONS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTIONS

1120 SIMMS BLDG. • P. O. BOX 1072 • PHONE 243-6491 • ALBUQUERQUE, NEW MEXICO

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
September 4, 1968

EXAMINER HEARING

IN THE MATTER OF:

Application of Penroc Oil Corporation
for a waterflood project, Eddy County,
New Mexico.

Case 3849

BEFORE: Elvis A. Utz
Examiner

TRANSCRIPT OF HEARING

MR. UTZ: The hearing will come to order, please.
Case 3849.

MR. HATCH: Case 3849. Application of Penroc Oil Corporation for a waterflood project, Eddy County, New Mexico.

MR. CONNELLY: Mr. Examiner, I'm Harry S. Connelly, Jr., with Stephenson, Campbell and Olmsted, entering an appearance for Penroc as New Mexico counsel. We have one witness, Mr. William LeMay, and Mr. Don Stevens of the Texas Bar will handle the questioning of Mr. LeMay.

(Witness sworn.)

MR. UTZ: Are there other appearances in this case? You have some exhibits to be marked?

MR. STEVENS: Yes. George, do you have those exhibits for this hearing? Would they be here in the file?

(Whereupon, Applicant's Exhibits Numbers 1 through 4, inclusive, were marked for identification.)

MR. UTZ: You may proceed.

WILLIAM J. LeMAY

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

DIRECT EXAMINATION

BY MR. STEVENS:

Q Mr. LeMay, would you state your name, occupation and

place of residence?

A William J. LeMay, Consulting Geologist from Santa Fe, New Mexico.

Q And are your qualifications as an expert geological witness made a matter of record with this Commission?

A Yes, they have.

Q Would you state for the Examiner, briefly, what Penroc Oil Corporation seeks by this application.

Q Penroc seeks to institute a waterflood operation in its MG Phillips Lease which is located on Exhibit 1, being the South Half of the Northeast Quarter, the North Half of the Southeast Quarter, and the Southeast Quarter of the Southeast Quarter, Section 27, Township 17 South, Range 28 East, Eddy County, New Mexico, by conversion of one well; the Castle and Wigzell, which is now changed to Penroc; Phillips State Number 4, located 1650 feet from the south line and 330 feet from the east line of Section 27, 17 South, Range 28 East and use this as an injection well in their flood.

Q Would you locate on the plat marked Exhibit 1 the wells in the area?

A Yes. The Exhibit Number 1, the area that I just identified should be colored yellow and the injection well, the proposed injection well, has a diagonal symbol colored red

on it. The other wells in the area are Empire-Abo wells which are circled with the exception of two wells in the Southeast Quarter of the Northeast Quarter which are both Grayburg wells and are producing one allowable.

In the injection 40 itself, there are three wells being the injection well, a shallow well drilled and producing from the Seven Rivers Formation and a deep Empire-Abo well.

Q And all the other wells in the project area, could you tell us what they're producing from?

A Yes. They're producing from the Premier Sand, the field is the Red Lake Field, and they are all of marginal status; the east Empire, which has Seven Rivers Pay and Grayburg Pay.

Q Is this project in conjunction with existing waterflood projects?

A Pardon?

Q Is this project, that the Applicant seeks today, in conjunction with an existing waterflood project previously approved by the Commission?

A Yes, it is. It borders the waterflood, Depco waterflood, which lies directly east of Penroc's proposed flood area.

Q To your knowledge, does the operator have an agreement with Depco by this flood?

A Yes. There's a line agreement with Penroc; Depco and Penroc have a line agreement concerning the flooding of the Premier Sand.

Q Could you give us the source of the water that is proposed to be injected?

A Yes. The source is the same as that which Depco -- and that is, Penroc proposed to get their water from the Double Eagle Water Company which will be pressurized fresh water.

Q What is the original source, geologically, of that water?

A It's fresh water on top of the Caprock.

Q Would you give us the pressures proposed to be used and the procedure of operation and how it compares with the Depco waterflood project?

A Yes. Penroc proposes to inject into the Phillips State Number 4, 300 barrels of water per day with an injection pressure of 1200 pounds. This is less than what was approved in the Penroc area.

Q How many barrels of water per day are proposed to be injected?

A 300 barrels of water per day.

MR. STEVENS: At this point, I'd like to ask the Examiner to take administrative notice of Order Number R-3311

which is the order which created the Depco Artesia waterflood.

MR. UTZ: Will do.

Q Mr. LeMay, referring to Exhibit Number 2, would you explain that Exhibit 2 to the Commission?

A Yes. Exhibit Number 2 is the proposed injection well, the Penroc Phillips State Number 4, the operator was changed from Castle and Wigzell to Penroc. It has listed the tops and also the casing that was set in the hole: eight and five-eighths inch surface casing was set at 567 feet, cemented with 50 sacks and a calculated top of the cement was 100 feet.

The production string was set, which was five and a half inch casing at 2,081 feet, cemented with 365 sacks and a calculated top of the cement was arrived there at 401 feet. The tops and formations encountered in the well are marked on Exhibit 2-B; the Seven Rivers Formation encountered at 854 feet, the Penrose Formation at 1606 feet, the top of the Grayburg at 1778 feet, the top of the Premier Sandstone at 2,049 feet, the top of the San Andres at 2,078 feet, and you will note that the Premier Sand, the pay section in the well, was perforated from 2,056 feet to 2,064 feet with two shots per foot.

It was acidized with 100 gallons and sand fracked with 2200 gallons and 40,000 pounds of sand. The well was

completed in January of 1961.

Q Are these perforations the ones proposed for water injection?

A Yes, they are.

Q And is that the same pay formation which is under flood in the adjoining Depco waterflood field?

A Yes, it is.

Q Could you explain the plat marked Exhibit 3 to the Commission?

A Exhibit 3 is a diagrammatic sketch of the injection well, showing the hole size, the type and depth of casing set, the cement used and the tubing and Baker Packer used in this proposed -- in the hole. Going to the Exhibit of the eleven inch hole, eight and five-eighths inch casing, 24 pound J-55 was set at 567 feet with 50 sacks of cement, the hole size below that was eight inch from 567 to 2083 and five and a half inch production string was set inside of the eight inch hole. Type of casing used was 14 pound J-55 casing. It was set at 2,081 feet with 365 sacks of cement and the calculated top of the cement there was 401 feet.

The operator plans to use two inch plastic coated tubing which will be hung on a Baker tension packer set at 2,000 feet. The injection interval is 2,056, to 2,064, the

Premier Sand, which will be the sand that is to be water-flooded. The top of the San Andres, as mentioned previously, at 2,078, and the total depth of the hole is 2,083 feet.

Q In your opinion, would this set-up for an injection well be one that would protect any pay behind the pipe or any waters behind the pipe from casing leaks?

A Yes, it would, because the injection well would be monitored with casing pressure at the surface and it is not an open hole completion, which is the case in many of the older wells in the area. It is cased. There is good control on the formation because of the perforations. It's a relatively new well in comparison with the older wells in the field. In other words, the hole is in good shape. And there would be monitoring safeguards against contamination of surface waters or other formations

Q Could you explain your corrosion controls?

A Yes. As mentioned before, the two inch tubing will be plastic coated.

Q Would you refer to the plat marked Exhibit 4 and explain that to the Examiner, please?

A Exhibit 4 is a tabulation of both the present daily production of the lease and the total production to date. As you will notice, 148,806 barrels has been produced from the

operator's lease, and the current production is averaging a barrel and a half per day, which is the economic limit.

Q Could you make an estimate of the recovery you would expect from this waterflood project? Additional barrels of oil which might be produced as a result of the project.

A I would anticipate a one-to-one secondary to primary based on the success of comparable floods in the area and of the nature of the sand being a floodable sand, being a gas-solution reservoir. A one-to-one would be a reasonable estimate.

Q From your study of this waterflood project, do you have an opinion as to whether this waterflood would prevent waste and would it permit you to recover oil that might otherwise not be recovered?

A Yes, I think the granting of the request to waterflood this lease would protect correlative rights and would allow the operator to recover his just and equitable share of the production.

Q Would you make a recommendation to the Commission concerning this Applicant's request?

A I would recommend that the application be approved to inject water into the Phillips Number 4 with adequate monitoring safeguards to protect surface waters.

Q Were Exhibits 1 through 4 prepared by you or under your supervision?

A Yes.

MR. STEVENS: Mr. Examiner, we'd like to request that Applicant's Exhibits 1 through 4 be admitted into evidence at this time.

MR. UTZ: Without objection, Exhibits 1 through 4 will be entered into the record in this case.

(Whereupon, Applicant's Exhibits Numbers 1 through 4, inclusive, were admitted in evidence.)

MR. STEVENS: And we have no further questions on direct.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. LeMay, did you mention how you were going to take care of the annulus?

A Yes. There would be a pressure gauge at the surface on the casing string which would tell us if we ran into trouble on leaks.

Q Will the annulus be filled with an inhibited fluid?

A Yes, it will. I forgot to mention that.

MR. UTZ: Are there any other questions of the witness? You may be excused. The case will be taken under advisement.

I N D E X

<u>WITNESS</u>	<u>PAGE</u>
WILLIAM J. LeMAY	
Direct Examination by Mr. Stevens	2
Cross Examination by Mr. Utz	10

E X H I B I T S

<u>Number</u>	<u>Marked for Identification</u>	<u>Received in Evidence</u>
Applicant's Exhibits 1 through 4	2	10

STATE OF NEW MEXICO)
) ss.
 COUNTY OF BERNALILLO)

I, CHARLOTTE MACIAS, 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 2nd day of October, 1968.

Charlotte Macias
 Notary Public

My Commission Expires:

February 10, 1971.

I do hereby certify that the foregoing is a complete record of the proceedings in the hearing of Case No. 3849, held by me on *Sept. 4*, 1968.
Theresa R. Member
 New Mexico Oil Conservation Commission

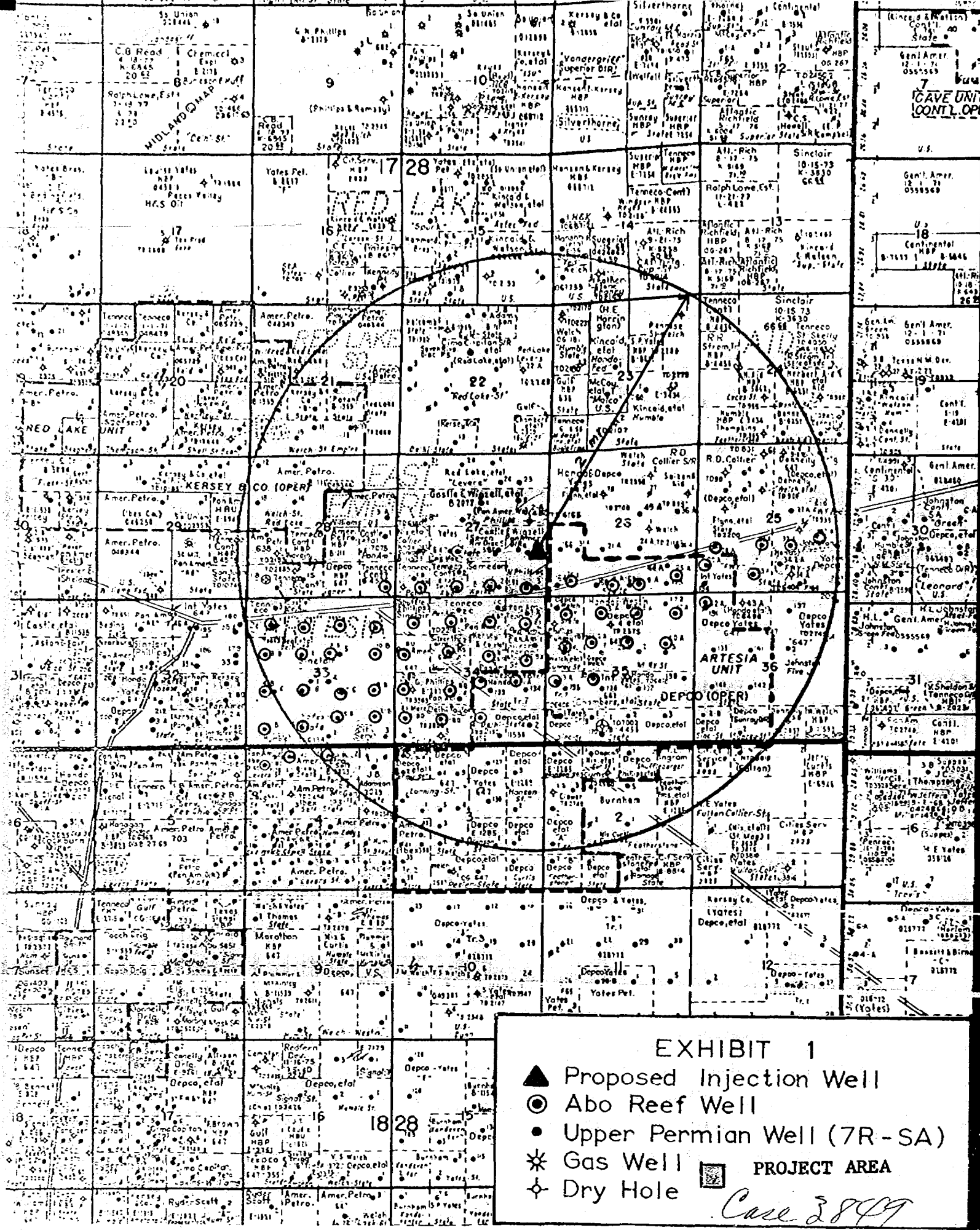
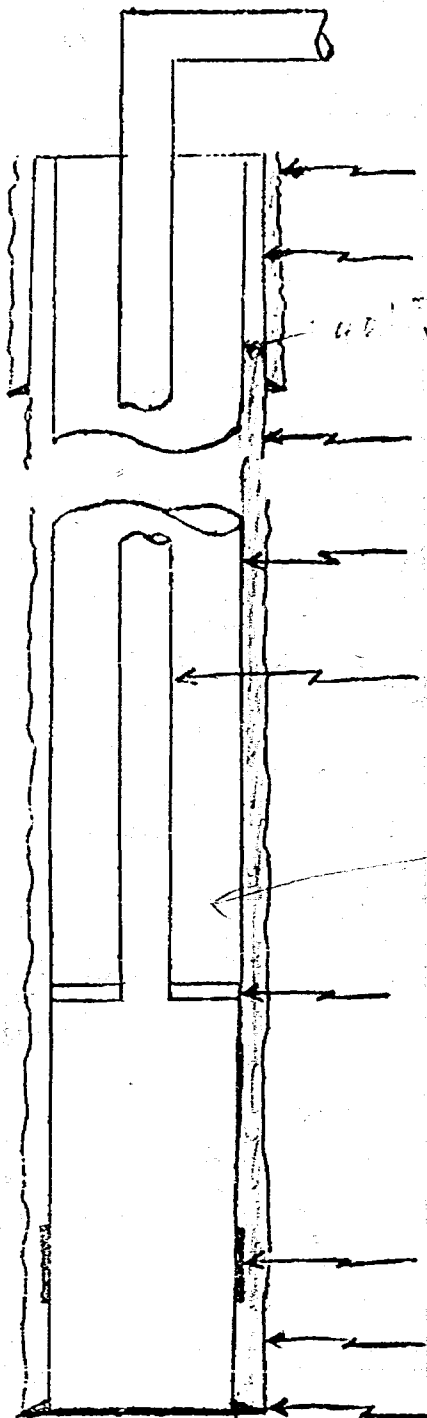


EXHIBIT 3



Hole size, 11".

8-5/8", 24#, J-55 casing set at 567' with calculated cement top of 100'. *165' Cement*

Hole size 8" from 567' to 2083'.

5-1/2", 14#, J-55 casing set at 2081' with 365 sacks of cement with a calculated top of cement 401'.

Plastic coated 2" EUE.

Baker tension packer set at 2000'.

Injection Interval, 2056 - 2064', (Premier Sand).

Top San Andres, 2078'.

Total Depth, 2083'.

CASTLE AND WIGZELL

Phillips - State #4 (PENROD)
Red Lake Field
1650' FSL and 330' FEL
Section 27-17S-28E
Eddy County, New Mexico

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
Appl. EXHIBIT NO. 3
CASE NO. 3849

Case 3849

EXHIBIT 4

CASTLE & WIOZELL (PENROC, OPERATOR)

N. G. Phillips-State Lease
27-17-28 Eddy Co., New Mexico

June 1, 1968

DAILY PRODUCTION, Bbls.

Well No. 1	1.5
2	1.5
3	1.5
4	1.5
5	2.0
7	2.0
8	2.0
9	1.0
Total	13.0

TOTAL PRODUCTION, Bbls.

19,351
18,062
27,354
23,240
19,707
20,008
16,478
4,606

148,806

1,530.00

BEFORE EXAMINER LITZ	
OIL CONSERVATION	
Appli	EXHIBIT NO. 4
CASE NO.	3849

Case 3849