

CASE 3524: Application of STANDARD
OIL CO. OF TEXAS for a waterflood
project, Eddy County, N. Mex.

CASE No.
3524

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. 3524
Order No. R-3192

APPLICATION OF STANDARD OIL COMPANY
OF TEXAS 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 February 8, 1967,
at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 13th day of February, 1967, 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, Standard Oil Company of Texas, seeks
permission to institute a waterflood project in the Atoka-San
Andres Pool by the injection of water into the San Andres formation
through its H. R. Stroup Well No. 6, located in Unit C of Section
11, Township 18 South, Range 26 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. 3524

Order No. R-3192

(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, Standard Oil Company of Texas, is hereby authorized to institute a waterflood project in the Atoka-San Andres Pool by the injection of water into the San Andres formation through its H. R. Stroup Well No. 6, located in Unit C of Section 11, Township 18 South, Range 26 East, NMPM, Eddy County, New Mexico.

(2) That the subject waterflood project is hereby designated the Standard Atoka Stroup 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.

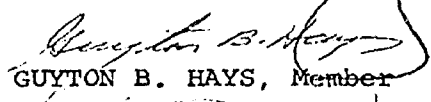
(4) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.


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

S E A L

esr/

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO

March 3, 1967

Mr. Jason Kellahin
Kellahin & Fox
Attorneys at Law
Post Office Box 1769
Santa Fe, New Mexico

Dear Mr. Kellahin:

Reference is made to Commission Order No. R-3192, entered in Case No. 3524, approving the Standard Oil Company Atoka-Stroup Waterflood Project.

Initial water injection is to be through the one authorized water injection well, which shall be equipped with plastic-coated tubing set in a packer at 1660 feet. The casing-tubing annulus shall be loaded with inert fluid and the annulus left open or equipped with a pressure gauge.

As to allowable, our calculations indicate that when the authorized injection well has 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 168 barrels per day.

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

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO

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March 3, 1967

Mr. Jason Kellahin
Kellahin & Fox
Attorneys at Law
Post Office Box 1769
Santa Fe, New Mexico

allowable provisions of Rule 701, it behooves him to promptly 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 reached 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/DSN/esr

cc: Oil Conservation Commission
P. O. Box 1980
Hobbs, New Mexico

Mr. Frank Irby
State Engineer Office
Capitol Building
Santa Fe, New Mexico

COPY

State of New Mexico
Oil Conservation Commission



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

Other _____



STATE OF NEW MEXICO

STATE ENGINEER OFFICE

SANTA FE

S. E. REYNOLDS
STATE ENGINEER

January 20, 1967

ADDRESS CORRESPONDENCE TO:
STATE CAPITOL
SANTA FE, NEW MEXICO 87501

Per 3524

Mr. A. L. Porter, Jr.
Secretary-Director
Oil Conservation Commission
Santa Fe, New Mexico

Dear Mr. Porter:

Reference is made to the application of Standard Oil Company of Texas for approval of a waterflood project in the Atoka (San Andres) Pool, Eddy, County, New Mexico. Only one well is involved which is the H.R. Stroup #6 well located 990' from the North line and 2310' from the West line of Sec. 11, T. 18 S., R. 26 E.

A study of the application and the diagrammatic sketch attached thereto indicate that no threat of contamination to the fresh waters which may exist in the area will occur if the application is approved, provided the packer on the end of the tubing is set well below the top of the cement surrounding the 5½' casing. Therefore, this office offers no objection to the granting of the application, provided the packer on the end of the tubing is set well below the top of the cement surrounding the 5½ inch casing.

FEI/ma
cc-Standard Oil Co.
F. H. Hennighausen

Yours truly,

S. E. Reynolds
State Engineer

By: *Frank E. Irby*
Frank E. Irby
Chief
Water Rights Div.

DOCKET: EXAMINER HEARING - WEDNESDAY - FEBRUARY 8, 1967

9 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 3523: Application of Aztec Oil & Gas Company for a dual completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the dual completion (conventional) of its Fed."M" Well No. 1 located in Unit L of Section 27, Township 18 South, Range 33 East, Lea County, New Mexico, to produce oil from the South Corbin-Strawn Pool and to produce gas from the South Corbin-Morrow Gas Pool through parallel strings of tubing.

CASE 3524: Application of Standard Oil Company of Texas 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 San Andres formation through its H. R. Stroup Well No. 6 located in Unit C of Section 11, Township 18 South, Range 26 East, Atoka-San Andres Pool, Eddy County, New Mexico.

CASE 3261 (Reopened)

In the matter of Case No. 3261 being reopened pursuant to the provisions of Order No. R-2931-B, which order assigned a 160-acre proportional factor of 4.77 to the Jenkins-Cisco Pool, Lea County, New Mexico, for a period of six months, rather than the usual factor of 6.77 for a 160-acre pool of this depth. All interested parties may appear and show cause why the 160-acre proportional factor of 4.77 assigned to said pool should not be retained.

CASE 2750 (Reopened)

In the matter of Case No. 2750 being reopened pursuant to the provisions of Order No. R-2441, which order established 640-acre spacing units for the Indian Basin-Morrow Gas Pool, Eddy County, New Mexico, for a period of one year after first pipeline connection in the pool. All interested parties may appear and show cause why said pool should not be developed on 320-acre spacing units.

CASE 2749 (Reopened)

In the matter of Case No. 2749 being reopened pursuant to the provisions of Order No. R-2440, which order established 640-acre spacing units for the Indian Basin-Upper Pennsylvanian Gas Pool, Eddy County, New Mexico, for a period of one year after first pipeline connection in the pool. All interested parties may appear and show cause why said pool should not be developed on 320-acre spacing units.

BEFORE THE
OIL CONSERVATION COMMISSION OF NEW MEXICO

IN THE MATTER OF THE APPLICATION
OF STANDARD OIL COMPANY OF TEXAS
FOR APPROVAL OF A WATERFLOOD
PROJECT, ATOKA (SAN ANDRES) POOL,
EDDY COUNTY, NEW MEXICO

Case 3524

A P P L I C A T I O N

Comes now Standard Oil Company of Texas, a division of Chevron Oil Company, and applies to the Oil Conservation Commission of New Mexico for approval of a waterflood project in the Atoka (San Andres) Pool, Eddy County, New Mexico, and in support thereof would show the Commission:

1. Applicant proposes to inject water into the San Andres pay zone in its H. R. Stroup No. 6 well, located 990 feet from the North line and 2310 feet from the West line of Section 11, Township 18 South, Range 26 East, N.M.P.M., injection to be through tubing and under a packer, at a depth of approximately 1694 feet, more or less.

2. There are attached to this application, and made a part hereof, the following exhibits:

- a. Plat of the Atoka Field surrounding the proposed injection well.
- b. Log of the proposed injection well.
- c. Diagrammatic sketch of the proposed injection well.

3. The water to be injected will be water gathered from applicant's Atoka (San Andres) Pool producing wells. Initial injection will be at the rate of approximately 125 barrels of water per day. It is anticipated that this injection rate will be increased in the future.

4. The Atoka (San Andres) Pool is at an advanced stage of depletion.

DOCKET MAILED

Date 1-26-67
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5. By copy of this application, with exhibits attached, notice of this application has been given to the New Mexico State Engineer as required by the rules of the Commission.

WHEREFORE, applicant requests that this application be set for hearing before the Commission's duly appointed examiner, and that after notice and hearing as required by law, the Commission enter its order approving this waterflood project as applied for.

Respectfully submitted,

STANDARD OIL COMPANY OF TEXAS

BY: Jason W. Kellahin
JASON W. KELLAHIN

KELLAHIN & FOX
POST OFFICE BOX 1769
SANTA FE, NEW MEXICO

ATTORNEYS FOR APPLICANT

dearnley-meier reporting service inc.

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

February 8, 1967

IN THE MATTER OF:

Application of Standard Oil
Company of Texas for a waterflood
project, Eddy County, New Mexico

Case 3524

Before: Daniel G. Nutter

TRANSCRIPT OF HEARING

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MR. NUTTER: We will call Case 3524.

MR. HATCH: Case 3524, Application of Standard Oil Company of Texas, for a waterflood project, Eddy County, New Mexico.

MR. KELLAHIN: If the Examiner please, Jason Kellahin, Kellahin & Fox, appearing for the applicant. We have one witness I would like to have sworn, please.

(Witness sworn)

JOHN T. CAMERON, called as a witness on behalf of the applicant, having first been duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A John T. Cameron.

Q By whom are you employed and in what position, Mr. Cameron?

A Standard Oil Company of Texas, proration engineer in Houston.

Q Have you ever testified before the Oil Commission of New Mexico and made your qualifications a matter of record?

A Yes.

MR. KELLAHIN: Are the witness' qualifications acceptable?

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MR. NUTTER: Yes, sir.

(Whereupon Applicant's Exhibits 1 through 5 were marked for identification)

Q (By Mr. Kellahin) Mr. Cameron, referring to what has been marked as Exhibit Number 1, would you identify that Exhibit, please?

A Yes, sir, that is a plat of the Atoka Field Area showing by legend the zone of completion of all of the wells in the area. Of course, the zone we are interested in is the San Andres-Atoka Field. The proposed injection well is the Standard of Texas H.R. Stroup Well Number 6. That well is colored in red. To the east, the same sand formation, along with the Grayburg, is called the Red Lake Field. In our area, is the Atoka-San Andres, and that is the area we propose to water flood.

Q The Exhibit shows ownership and zone completion of all the wells within a two-mile radius of the injection well.

A Yes, it does.

Q Are there any other injection projects of the San Andres in this area?

A Yes, sir, in Section 13, the Quani is injecting produced water in their Levied S, Number 9. They commenced that injection in October, 1965.

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Q Now, as I understand the application before the Commission at this time is for what would be called a pilot project, is that correct?

A That's correct. We hope that to be a forerunner of a full scale flood of the Atoka sand pool.

Q Has any work been done in connection with that?

A Yes, sir. An operator committee formed a technical subcommittee composed of engineers and geologists of Standard of Texas. Quani and Mobil have conducted an engineering survey and completed a report on the Atoka-San Andres Pool in which they recommended that the field be unitized and water flooded.

Q And, will approval of that application then give you information which will be useful in determining whether a full scale flood will be initiated?

A Yes, sir, it will.

Q Now, turning to what has been marked as Exhibit Number 2, will you identify that Exhibit, please?

A Exhibit Number 2 is a reservoir data sheet for the Atoka-San Andres, setting out the reservoir characteristics. As I said, this is the San Andres dolomite and the porosity permeability and other parameters are given on this data sheet and you will notice that it is a solution gas drive reservoir, statistical records show the number of wells being

dearnley-meier 112C 120C

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72 in the total field. Currently producing rate as of October, 1966, was seven and a half barrels of oil per day per well. You will note that the Stroup Well that we propose to convert to injection is now producing one barrel of oil and two barrels of water per day.

Q Would you say that the well is in a stripper stage?

A Yes, sir, I would.

Q Now, under the heading "Details of Proposed Water Flood", you state that the primary purpose is the disposal of produced water. Would you clarify that, please?

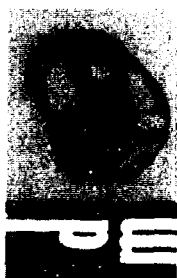
A Yes, we are producing about 150 barrels of water per day now. About 35 of this is going into the Quani into their injection project on the Levied S. lease. The remainder of the water is being trucked at some expence, and we want to dispose of it in the Stroup well to save ourselves the expense of trucking the water. That is our first purpose of this project. The secondary purpose is to set up the pilot project for the flood that we have already mentioned.

Q But essentially, you are applying your pilot water, and not necessarily your salt water disposal system, is this a correct statement of the proposal?

A Yes.

Q Did you say what volume of water you will inject?

A We anticipate 125 barrels per day, which all



production is from the Standard of Texas at this time, except what is going to the Quani.

Q This water is being produced from the San Andres wells?

A Yes, sir, it is the same zone.

Q And is it from wells in, open in the same zone as your injection well, is that correct?

A That's correct.

Q It is a corrosive water?

A Yes, it is.

Q Now, turn to what has been marked as Exhibit Number 3, would you identify that Exhibit?

A This is a diagrammatic sketch of the Stroup Number 6 well, showing casing cement and tubing, and so forth.

Q What type of tubing will you use in this well?

A We are using plastic-coated, two inch tubing.

Q Will you be injecting under a packer?

A Yes, we will.

Q And will you put an inert fluid behind the casing tubing annulus?

A Yes, sir, we will.

Q Mr. Cameron, in your opinion, will this type of completion adequately produce in the fresh water zone or any other producing zones that may be in this area?

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A I don't see any hazard to any fresh water or other productive zones in the area.

Q Is it the type of completion that has been utilized for water injection in other fields?

A Yes, it is.

Q Turning to what has been marked as Exhibit Number 4, would you identify that Exhibit, please?

A This is a plot of production history of the Atoka-San Andres Pool, in barrels, in daily average barrels, but average over the years in question. The only thing I want to note is the number, starting in about 1963, and leveling off of production since that time caused by completion of just natural wells in the pool.

Q No, rapid decline after completion?

A That's correct, yes.

Q Now, is your 1966 production based on any report?

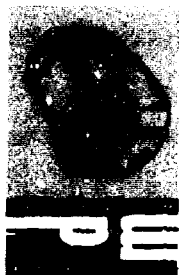
A Well, this is true, we didn't have the November and December production, so 1966 was estimated, the last part of '66.

Q Does this indicate that this area of the field is at an advanced stage of depletion in your opinion?

A Yes, it is at an advanced stage of depletion.

Q And it would be ready for a secondary recovery project?

A Yes, it is.



Q Turn, now, to Exhibit Number 5.

A This is a Gamma Ray Neutron Log of Injection Wells. The Stroup No. 6, it is marked as to zones and the perforated interval marked. Of course many of the perforations that we are not producing, logs of perforated intervals, when we convert it to injection.

Q Now, referring back to Exhibit Number 1, what wells would you anticipate would receive a response from injection of this well?

A Well, of course, the nearest wells, the nearest offset, would be our Stroup lease, the No. 1, 2 and 3, they would be the first ones to show any response.

Q In the event of response, you would anticipate opening this project under the provisions of Rule 701, would you?

A Yes.

Q Were Exhibits 1 through 5 prepared by you or under your supervision?

A they were.

MR. KELLAHIN: At this time, I would like to offer in evidence Exhibits 1 through 5 inclusive.

MR. NUTTER: Standard's Exhibits 1 through 5 will be admitted in evidence. (Whereupon Applicant's Exhibits 1 through 5 were admitted in evidence.)

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MR. NUTTER: Mr. Cameron, the seven and five-eighths inch casing in this injection well is set above the base of the artesian water sand in this, is that correct?

THE WITNESS: That's correct.

MR. KELLAHIN: If the Commission please, I believe there is a letter in the file from the State Engineer's Office requesting no objection to this project. That completes our direct examination.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Cameron, do you have any idea as to what the disposition of the remainder of the 146 barrels of salt water that is being produced in the pool? Now, you stated that your water is either being used by the Quani or trucked out.

A Yes, ours is, and the balance of it is, I think is being trucked out.

Q As far as you know, this is not being disposed of in open pits in this area?

A I don't think there are any open pits, no.

Q Do you have any idea, Mr. Cameron, as to what your injection pressure will be?

A We anticipate 605 pounds of surface pressure. This is from the injection history in the Quani Levied well, at that pressure they would have been able to get away 125

barrels a day.

Q Have they had response?

A They haven't had production, probably they have had some water break through their system. One wouldn't -- we want to find out about it, or about the injection.

Q I notice your well is rather an edge well, as far as the pool.

A It is slightly low, yes. To the north of that, there are no producing wells.

MR. NUTTER: Are there any further questions of Mr. Cameron?

CROSS EXAMINATION

BY MR. STAMETS: R. L. Stamets, Oil Conservation Commission, Artesia, New Mexico.

Q Mr. Cameron, what is the purpose of this inert fluid in the casing tubing annulus?

A Well, that would probably be salt water in this casing, and this would be so that you could tell if you had a tubing leak, you would get pressure on the surface annulus and you would know you had a tubing leak, and you would stop the injection to find out what the problem was. If you had no fluid in there, you could create a problem without knowing --

Q In other words, your field personnel would maintain the gauges in good condition and read these things occasionally?

A Yes, they would.

CROSS EXAMINATION

BY MR. NUTTER:

Q You say this inert fluid would be salt water?

A I would say this is correct.

Q Will it be chemically treated?

A It would not be corrosive produced salt water, no.

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

(Witness excused)

MR. NUTTER: Do you have anything further, Mr. Kellahin?

MR. KELLAHIN: That's all I had.

MR. NUTTER: Does anyone have anything they wish to offer?

MR. HATCH: I have a letter from the State Engineer's Office, dated January 20th, that Mr. Kellahin spoke of, in which the State Engineer offers no objection to the drainage of the Atoka provided the box end of the tubing is set well below the top of the cement surrounding the five and a half inch casing.

MR. NUTTER: Mr. Cameron, I believe your Exhibit shows that the cement on the five and a half inch casing comes back to 135 feet.

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THE WITNESS: That is the calculated top, yes, sir,
well up into the surface casing.

MR. NUTTER: Is there anything further in this case?
We will take the case under advisement.

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

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STATE OF NEW MEXICO)
)
COUNTY OF BERNALILLO)

I, JERRY POTTS, 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 March, 1967

Notary Public

My Commission expires:

July 10, 1970

I do hereby certify that the foregoing is a complete record of the proceedings in the Exhaustor Hearing of Case No 3524 heard by me on 2/8 1967.

New Mexico Oil Conservation Commission

STANDARD OIL COMPANY OF TEXAS
STROUP LEASE WATERFLOOD
ATOKA (SAN ANDRES) POOL
PERTINENT DATA

Reservoir Characteristics

Formation	San Andres Dolomite
Porosity	7.1%
Permeability	1.6 md
Water Saturation	35%
Initial Pressure	610 psi
Reservoir Temperature	89°F
Solution Gas-Oil Ratio	285 cfpb
Primary Drive Mechanism	Solution Gas Drive

Statistical Data

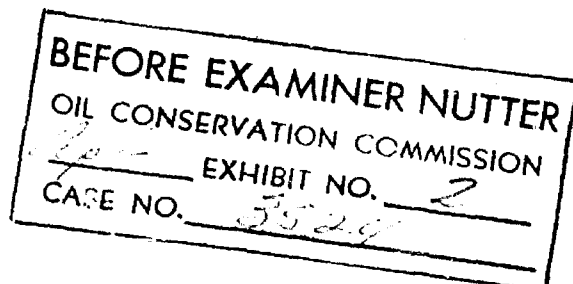
Number of Wells (October 1966)	
Producing	72
Temporarily Abandoned	1
Water Injection	1
Current Producing Rate (October 1966)	
Oil	557 BFD or 7.5 BPD/Well
Water	460 BFD or 6.2 BPD/Well
Gas	1,011 MCFPD or 1,815 cfpb GOR

Details of Proposed Waterflood

Purpose of Water Injection:

1. Primary purpose is the disposal of produced water. Full scale waterflood has been proposed, but need for disposal exists now, to avoid expense of trucking produced salt water.
2. Secondary purpose is a pilot waterflood, to gain knowledge of injectivity, and to prepare for full scale waterflood. This pilot is expected to have beneficial effects, though very small, on ultimate recovery from field.

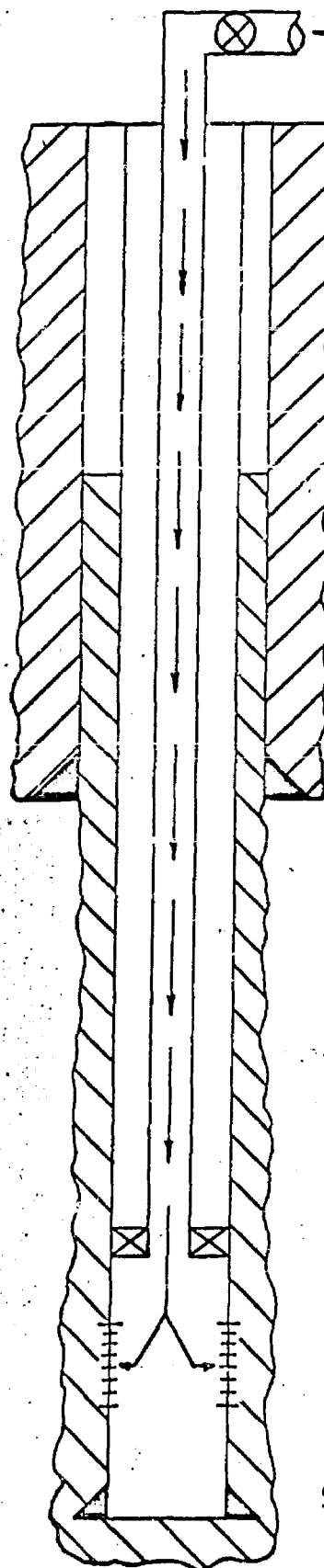
Proposed Injection Well:	Standard of Texas No. 6 H. R. Stroup
Location:	Unit C, Sec. 11, T-18-S, R-26-E
Current Status of Well:	Producing 1 BO and 2 BWPD
Source of Water:	Produced Salt Water
Anticipated Water Quantity:	125 BPD
Anticipated Surface Pressure:	650 psi
Injection Interval:	Perforations 1696-1706'



PROPOSED WATER INJECTION WELL

WELL NAME AND NUMBER H. R. STROUP NO. 6

Calculated or logged top
of cement at 135 feet.



Cement circulated at the
surface for 7-5/8" casing.

Tubing size 2-3/8"
(PLASTICOATED)

7-5/8" casing set at 1232 feet,
cemented with 450 sacks
of cement.

Type packer Retr. Tension

Packer set at 1660 feet.

Perforations 1696'-1706'

5-1/2" casing set at 1782 feet,
cemented with 150 sacks
of cement.

TD at 1783 feet.

PBTD at 1776 feet.

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
CASE NO. 2004
EXHIBIT NO. 1

10 X 10 TO THE INCH 46 0702
KEUFFEL & ESSER CO. MADE IN U.S.A.

