

Case No.

2592

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Application, Transcript,  
Small Exhibits, Etc.



1003 APR 5 AM 1963  
STATE OF NEW MEXICO

STATE ENGINEER OFFICE

SANTA FE

S. E. REYNOLDS  
STATE ENGINEER

April 4, 1963

2897  
ADDRESS CORRESPONDENCE TO:  
STATE CAPITOL  
SANTA FE, N. M.

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

Dear Mr. Porter:

Reference is made to the application of Skelly Oil Company for approval of a secondary recovery project, Lea County, New Mexico which was heard as your Case No. 2592 and was approved by Order R-2278. The Skelly Company has made a change in their plans and has notified me by letter dated April 1, 1963. No copy of this letter was indicated for you, therefore, I am enclosing a copy for your reference. In view of Mr. Aab's statement in the first paragraph of his letter "Tubing for this well will be internally plastic coated and injection will be below a packer as was planned for Unit Well No. 55." I find no reason to object to this change. Mr. Aab also states that Unit Well No. 58 will not be used because it is not feasible to enter this plugged and abandoned well at this time. I have no objection to the elimination of this well from the planned program.

Yours very truly,

S. E. Reynolds  
State Engineer

By *Frank E. Irby*  
Frank E. Irby  
Chief  
Water Rights Division

FEI/ma  
encl.  
cc-H. E. Aab  
F. H. Hennighausen



# SKELLY OIL COMPANY

P.O. Box 23, Hobbs, New Mexico  
April 1, 1963

Subject: Lovington San. Andres Unit  
Lea County, New Mexico

Mr. Frank E. Irby  
Chief  
Water Rights Division  
State Capitol  
Santa Fe, New Mexico

Dear Sir:

In our letter of November 1, 1962, we stated that Lovington San. Andres Unit Well No. 55 (formerly Shell State "A" No. 1) would be equipped with internally plastic coated tubing and that produced brine water from subject unit would be injected into this well. Since this well is plugged and abandoned, we feel there is no economic justification at the present time to re-enter this well. Therefore, we are substituting Unit Well No. 32 (formerly Amerada State "IA" No. 6) in it's place. Tubing for this well will be internally plastic coated and injection will be below a packer as was planned for Unit Well No. 55.

Also in our letter of November 1, 1962, we stated fresh water from the Ogallala formation would be injected into Unit Well No. 58. This is also a plugged and abandoned well and will not be re-entered at the present time due to economic justification.

To restate our proposed plan, the following wells will be used to inject produced brine:

<u>Unit Well No.</u>	<u>Former Operator, Lease Name &amp; Well No.</u>
L.S.A. Unit Well No. 32	Amerada State "IA" No. 6
L.S.A. Unit Well No. 34	Sunray Caylor No. 1
L.S.A. Unit Well No. 36	Skelly C. S. Caylor No. 1
L.S.A. Unit Well No. 50	Fan American Caylor No. 1

Fresh water from the Ogallala formation will be injected into the following wells:

<u>Unit Well No.</u>	<u>Former Operator, Lease Name &amp; Well No.</u>
L.S.A. Unit Well No. 4	Skelly State "NM" No. 1
L.S.A. Unit Well No. 6	Late Graham No. 1

ENGINEER OFFICE  
SANTA FE, N.M.

1003 APR-4 AM 8:17

Mr. Frank E. Irby  
Page 2

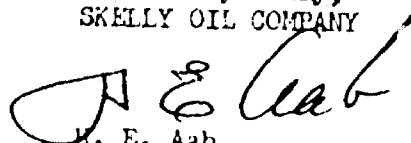
Unit Well No.

L.S.A. Unit Well No. 14  
L.S.A. Unit Well No. 16  
L.S.A. Unit Well No. 18  
L.S.A. Unit Well No. 28  
L.S.A. Unit Well No. 30  
L.S.A. Unit Well No. 46  
L.S.A. Unit Well No. 48  
L.S.A. Unit Well No. 54

Former Operator, Lease Name & Well No.

Skelly State "O" No. 2  
Skelly State "O" No. 4  
Tidewater State "P" No. 2  
Pan American State "E" No. 10  
Pan American State "E" No. 3  
Amerada State "LA" No. 7  
Mobil State "R" No. 1  
Tidewater State "M"

Yours very truly,  
SKELLY OIL COMPANY



H. E. Aab  
District Superintendent

HEA/LDJ/pjn

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. 2592  
Order No. R-2278

APPLICATION OF SKELLY OIL COMPANY  
FOR APPROVAL OF A SECONDARY RECOVERY  
PROJECT, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on June 28, 1962, at Santa Fe, New Mexico, before Elvis A. Utz, Examiner duly appointed by the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," in accordance with Rule 1214 of the Commission Rules and Regulations.

Now, on this 12th day of July, 1962, the Commission, a quorum being present, having considered the application, the evidence adduced, and the recommendations of the Examiner, Elvis A. Utz, 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, Skelly Oil Company, seeks permission to institute a secondary recovery project in the Lovington-San Andres Pool in the Lovington San Andres Unit Area comprising portions of Townships 16 and 17 South, Ranges 36 and 37 East, NMPM, Lea County, New Mexico, by the injection of water into the San Andres formation through 17 wells located in said unit area.

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

(4) That the waterflood project should be approved and should be governed by the provisions of Rule 701.

IT IS THEREFORE ORDERED:

(1) That the applicant, Skelly Oil Company, is hereby authorized to institute a waterflood project in the Lovington-San Andres Pool in the Lovington San Andres Unit Area comprising portions of Townships 16 and 17 South, Ranges 36 and 37 East, NMPM, Lea County.

-2-  
CASE No. 2592  
Order No. R-227E

New Mexico, by the injection of water into the San Andres formation through the following-described 17 wells:

<u>Well</u>	<u>Location</u>
Late Oil Co. Graham #1	Unit D, Sec. 31-16S-37E
Skelly - State "N" #1	Unit B, Sec. 36-16S-36E
Rodman Noel State "AE" #2 (to be drilled)	Unit L, Sec. 36-16S-36E
Tidewater - State "M" #2 (to be drilled)	Unit J, Sec. 36-16S-36E
Skelly - State "O" #2	Unit L, Sec. 31-16S-37E
Skelly - State "O" #4	Unit J, Sec. 31-16S-37E
Tidewater - State "P" #2	Unit L, Sec. 32-16S-37E
Moran Shipp - State "A" #1	Unit D, Sec. 5-17S-37E
Skelly - Caylor #1	Unit B, Sec. 6-17S-37E
Sunray DX - M. Caylor #1	Unit D, Sec. 6-17S-37E
Amerada - State "IA" #6	Unit B, Sec. 1-17S-36E
Pan American - State "E" #3	Unit D, Sec. 1-17S-36E
Pan American - State "E" #10	Unit B, Sec. 2-17S-36E
Mobil - State "R" #4	Unit J, Sec. 2-17S-36E
Amerada - State "IA" #7	Unit L, Sec. 1-17S-36E
Mobil - State "R" #1	Unit J, Sec. 1-17S-36E
Pan American and Amerada - Caylor #1	Unit L, Sec. 6-17S-37E

(2) That the subject waterflood project shall be governed by the provisions of Rule 701, including the allowable provisions thereof and including the provisions with respect to expansion of the waterflood project.

(3) 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.

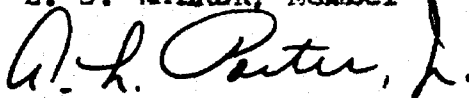
STATE OF NEW MEXICO  
OIL CONSERVATION COMMISSION



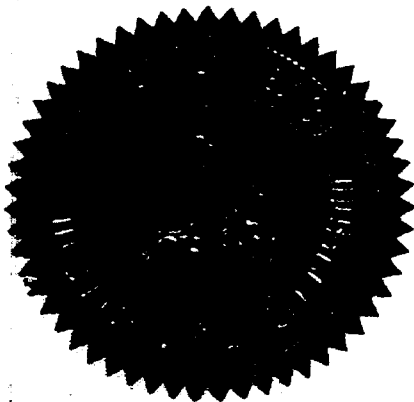
EDWIN L. MECHEM, Chairman



E. S. WALKER, Member



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



esr/

GOVERNOR  
EDWIN L. MECHAM  
CHAIRMAN

State of New Mexico  
Oil Conservation Commission

LAND COMMISSIONER  
E. S. JOHNNY WALKER  
MEMBER



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

P. O. BOX 871  
SANTA FE

July 13, 1962

Mr. George Selinger  
Skelly Oil Company  
Box 1650  
Tulsa 2, Oklahoma

Re: Case No. 2592  
Order No. R-2278  
Applicant:  
Skelly Oil Company

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

A. L. PORTER, Jr.  
Secretary-Director

ir/

Carbon copy of order also sent to:

Hobbs OCC x

Artesia OCC       

Aztec OCC       

OTHER Mr. Charlie White  
Mrs. Marion Rhea



STATE OF NEW MEXICO

STATE ENGINEER OFFICE

SANTA FE

S. E. REYNOLDS  
STATE ENGINEER

June 29, 1962

ADDRESS CORRESPONDENCE TO:  
STATE CAPITOL  
SANTA FE, N. M.

Case No. 2592

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

Dear Mr. Porter:

Reference is made to the application of Skelly Oil Company which seeks permission to institute a secondary recovery project in the Lovington-San Andres pool. This matter is numbered Case 2592 on your June 28, 1962 docket.

Mr. Jacobs of Skelly Oil Company has informed this office that each injection well will be equipped with packer placed just above the San Andres formation and injection will be made through a plastic coated tubing into the San Andres formation. In view of this statement, I have concluded that there will be no threat of contamination to the fresh waters which may occur in this area. Therefore, this office offers no objection to the granting of the application.

Very truly yours,

S. E. Reynolds  
State Engineer

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

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

CLASS OF SERVICE

This is a fast message unless its deferred character is indicated by the proper symbol.

# WESTERN UNION TELEGRAM

W. P. MARSHALL, President

SYMBOLS

DL = Day Letter

NL = Night Letter

LT = International Letter Telegram

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination.

LA138 DB293

D HSB345 PD=HOUSTON TEX 13 159P CST=

NEW MEXICO OIL CONSERVATION COMMISSION=

SANTA FE NMEX=

ATTN MR PORTER UNITED PRODUCING CO., INC. AS A WORKING  
INTEREST OWNER OF TWO WELLS IN THE LOVINGTON SAN ANDRES  
FIELD FAVORS UNITIZATION PER REQUEST OF SKELLY OIL  
COMPANY AT HEARING SCHEDULED FOR JUNE 28, 1962=

UNITED PRODUCING CO INQ PAUL S ACHE JR==

MAIN OFFICE 000

28 1962...

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE

This is a fast message unless its deferred character is indicated by the proper symbol.

# WESTERN UNION TELEGRAM

W. P. MARSHALL, PRESIDENT

1201 (1-60)

SYMBOLS

DL=Day Letter

NL=Night Letter

LT=International Letter Telegram

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

LA 120 SSB332

L RW 4058 PD=ROSWELL NMEX 26 1155A MST=

=NEW MEXICO OIL CONSERVATION COMMISSION=

SANTA FE NMEX=

=IN RE CASES NOS. 2592 AND 2593 DOCKET OF JUNE 28, 1962.

THIS IS TO ADVISE THAT SHELL OIL COMPANY SUPPORTS THE APPLICATION OF SKELLY OIL COMPANY FOR PERMISSION TO INSTITUTE A SECONDARY RECOVERY PROJECT IN THE LOVINGTON SAN ANDRES POOL AND THEIR APPLICATION FOR APPROVAL OF THE LOVINGTON SAN ANDRES UNIT AGREEMENT=

SHELL OIL CO R L RANKIN DIVISION PRODUCTION MANAGER..

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE

This is a fast message unless its deferred character is indicated by the proper symbol.

# WESTERN UNION TELEGRAM

W. P. MARSHALL, PRESIDENT

1201 (4-60)

SYMBOLS

DL=Day Letter  
NL=Night Letter  
LT=International Letter Telegram

The filing time shown on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination

LA132 SSH211

L HBA059 PD=HOBBS NMEX 27 128P MST=

NEW MEXICO OIL CONSERVATION COMMISSION, DAN MEADOR=  
SANTA FE NMEX=

CASE NUMBER 2592 AND CASE NUMBER 2593 SOCONY MOBIL OIL  
COMPANY INC AS A WORKING INTEREST OWNER IN THE LOVINGTON  
SAN ANDRESS UNIT RECOMMENDS THAT THE UNIT AND FIELD WIDE  
WATER FLOOD PROGRAM AS PROPOSED BY SKELLY BE APPROVED BY  
THE COMMISSION=

GLEN W BARB PRODUCING SUPERINTENDENT MOBIL OIL CO  
BOX 2406 HOBBS...

00 12 PM 27 JUN 1962

MAIN OFFICE 000

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

CLASS OF SERVICE

This is a fast message unless its deferred character is indicated by the proper symbol.

# WESTERN UNION TELEGRAM

W. P. MARSHALL, PRESIDENT

1201 (1-60)

SYMBOLS

DL=Day Letter  
NL=Night Letter  
LT=International Letter Telegram

The filing time shown in the date line on domestic telegrams is LOCAL TIME at point of origin. Time of receipt is LOCAL TIME at point of destination.

.LA115 KA318

K TUB156 NL PD=FAX TULSA OKLA 26=

OIL CONSERVATION COMMISSION=

STATE LAND OFFICE BLDG SANTA FE NMEX=

AS A WORKING INTEREST OWNER IN THE LOVINGTON SAN ANDRES  
UNIT AMERADA PETROLEUM CORPORATION CONCURS IN THE  
APPLICATION OF SKELLY OIL COMPANY FOR THE APPROVAL OF  
THE UNIT AGREEMENT AND SECONDARY RECOVERY PROJECT IN  
CASES NO 2592 AND 2593 SET FOR 9 AM JUNE 28 1962=

R S CHRISTIE AMERADA PETROLEUM CORPORATION==

2592 2593 9 28 1962...

THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

*Case 2-5 23*

# Sunray DX Oil Company

Tulsa 2, Oklahoma

Production Department



R. W. Griffith  
Manager, Unitization  
and Gas Sales Division

June 14, 1962

PG-7

New Mexico Oil Conservation Commission  
State Land Office Building  
College Avenue  
Santa Fe, New Mexico

ATTENTION: Mr. A. L. Porter, Jr.

Re: Lovington San Andres Unit  
Lea County, New Mexico

Gentlemen:

Skelly Oil Company and others have negotiated the formation of the referenced Unit. Skelly has advised us that a hearing will be held before the Commission on June 28, 1962 for approval of the Unit and a waterflood of the unitized formation.

Sunray DX Oil Company executed the Unit Agreement on May 18, 1962. Sunray supports Skelly's application and we respectfully request that the Commission approve both the Unit and the waterflood.

Very truly yours,

SUNRAY DX OIL COMPANY

*William R. Loar*

William R. Loar  
Superintendent of Unitization

DGP:lc

cc: Skelly Oil Company  
P. O. Box 1650  
Tulsa 2, Oklahoma  
Attention: Mr. Robert G. Hiltz

File 2593

# PAN AMERICAN PETROLEUM CORPORATION

OIL AND GAS BUILDING

P. O. BOX 1410

FORT WORTH 1, TEXAS

KENNETH J. BARR  
DIVISION ENGINEERJUN 15 1962 04  
June 14, 1962

File: GHF-269-986.510.1

Subject: NMOC Hearing  
Lovington San Andres Unit  
Lea County, New Mexico

Mr. A. L. Porter, Jr.  
Secretary-Director  
New Mexico Oil Conservation Commission  
P. O. Box 871  
Santa Fe, New Mexico

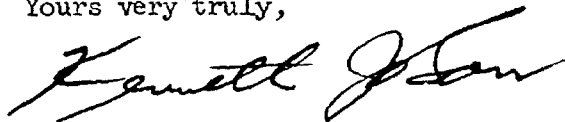
Dear Sir:

Reference is to the subject hearing which is docketed for June 28, 1962, on the application of Skelly Oil Company for approval of the proposed Lovington San Andres secondary recovery unit.

Pan American Petroleum Corporation supports Skelly in their application for approval of this project in that it is felt that the project will be in the interest of promoting conservation through increased recovery by secondary recovery methods.

Please read this letter into the record of the hearing.

Yours very truly,



cc: Skelly Oil Company  
Tulsa 2, Oklahoma

*Secondary  
recovery*



# SKELLY OIL COMPANY

P. O. Box 1650  
TULSA 2, OKLAHOMA

## PRODUCTION DEPARTMENT

C. L. BLACKSHER, VICE PRESIDENT  
W. P. WHITMORE, MGR. PRODUCTION  
W. O. CARSON, MGR. TECHNICAL SERVICES  
ROBERT G. HILTZ, MGR. JOINT OPERATIONS  
GEORGE W. SELINGER, MGR. CONSERVATION

June 1, 1962

*Don  
set for  
6/28 hrg.*

New Mexico Oil Conservation Commission  
P. O. Box 871  
Santa Fe, New Mexico

Attention: Mr. Richard Morris, Attorney

Gentlemen:

We are attaching an original and three copies of an application for authority to inject fluid into the San Andres formation in the Lovington San Andres Unit Area, Lea County, New Mexico. We are attaching to this application Exhibit "A" which is a Secondary Recovery Study of the Lovington San Andres Reservoir.

At the present time we do not have logs of the injection wells available for filing, but we will, however, file such logs, as are available, at the hearing. We will, also, at the hearing file an exhibit describing the proposed injection wells' casing and cementing program.

We would appreciate this matter being set for hearing on June 28, 1962, as discussed in our telephone conversation and our telegram of May 31, 1962.

Very truly yours,

*George W. Selinger*

*15/6/62*  
RJJ:br  
Attach.

cc: Mr. L. C. White  
Gilbert, White and Gilbert  
Bishop Building  
Santa Fe, New Mexico

Case 2592

Heard 6-28-62

BEST AVAILABLE COPY

Rec. 6-29-62

1. Grant. Skelly's request for the Lovington-San Andres-Water flood with the Lovington S-A. Unit, and the 17 Injection wells listed on the copy of Ex. #4 of this case.
2. Producing wells are of the stripper category.
3. Water for the Unit will be from the Ogallala formation in the area.
4. Line Admin. route for further Injection wells.

Shirley D. H.

KE 9/20  
MR. Davis

GLENN B. CHADWICK  
5011 ELMWOOD AVENUE  
LOS ANGELES 4, CALIFORNIA

June 13, 1962

Conservation Commission,  
State of New Mexico,  
Santa Fe, N. M.

Re: Lovington  
San Andreas Unit,  
Lea County, New Mexico

Gentlemen:

This letter is to tell you that  
I have signed the necessary papers approv-  
ing the unitization and to express the hope  
that your commission will act favorably on  
the formation of the unit.

Yours truly,

Thanks for  
Don Robert L. Hiltz

JUN 20 1962

BEFORE THE NEW MEXICO OIL CONSERVATION COMMISSION

IN THE MATTER OF THE APPLICATION OF )  
SKELLY OIL COMPANY FOR AUTHORITY TO )  
INJECT FLUID INTO THE SAN ANDRES )  
FORMATION IN THE LOVINGTON SAN ANDRES )  
FIELD, LEA COUNTY, NEW MEXICO. )

CASE 2547

FILED \_\_\_\_\_

HEARING \_\_\_\_\_

A P P L I C A T I O N

Comes now Skelly Oil Company on behalf of itself and others and respectfully states as follows:

1. That it is an owner and operator of oil and gas wells in the Lovington San Andres Field, Lea County, New Mexico.

2. That it desires to conduct secondary recovery operations in this field by injecting fluids into the San Andres formation, which formation shall be described and construed to mean the formation and reservoir encountered in the drilling by Amerada Petroleum Company's State "LA" Lease Well No. 1 between the depths of 4334 feet and 5240 feet as shown by the Gamma Ray Log of said well, which well is located in the NW/4 of the NE/4 of Section 1, Township 17 South, Range 36 East, Lea County, New Mexico.

3. That applicant proposes to conduct secondary recovery operations by injection of fluids into the San Andres formation, above described, in an area known as the Lovington San Andres Unit, which unit consists of portions of Townships 16 and 17 South, and Ranges 36 and 37 East, Lea County, New Mexico, containing an area of 2,469.81 acres, more or less, which area is more specifically set out on a map entitled "Figure 1 of Exhibit 'A'" attached hereto and made a part hereof by reference.

4. That initially applicant proposes to inject fluid into 17 wells as follows:

<u>Well</u>	<u>Location</u>
Late Oil Co. Graham #1	Unit D, Sec. 31-16S-37E
Skelly - State "N" #1	Unit B, Sec. 36-16S-36E
Rodman Noel - State "AE" #2 (to be drilled)	Unit L, Sec. 36-16S-36E
Tidewater - State "M" #2 (to be drilled)	Unit J, Sec. 36-16S-36E
Skelly - State "O" #2	Unit L, Sec. 31-16S-37E
Skelly - State "O" #4	Unit J, Sec. 31-16S-37E
Tidewater - State "P" #2	Unit L, Sec. 32-16S-37E
Moran Shipp - State "A" #1	Unit D, Sec. 5 -17S-37E
Skelly - Caylor #1	Unit B, Sec. 6 -17S-37E
Sunray D-X - M. Caylor #1	Unit D, Sec. 6 -17S-37E
Amerada - State "LA" #6	Unit B, Sec. 1 -17S-36E
Pan American - State "E" #3	Unit D, Sec. 1 -17S-36E
Pan American - State "E" #10	Unit B, Sec. 2 -17S-36E
Mobil - State "R" #4	Unit J, Sec. 2 -17S-36E
Amerada - State "LA" #7	Unit L, Sec. 1 -17S-36E
Mobil - State "R" #1	Unit J, Sec. 1 -17S-36E
Pan American and Amerada - Caylor #1	Unit L, Sec. 6 -17S-37E

Lea County, New Mexico. These wells are shown on a map marked "Figure 1 of Exhibit 'A'" above referred to, and further applicant may in the future desire to expand the secondary recovery project to include other wells within the unit area.

5. That attached hereto is a map marked "Figure 1 of Exhibit 'A'" which shows the proposed injection wells and the location of all wells and lessees within the limits of the field or a two-mile radius of said proposed injection wells.

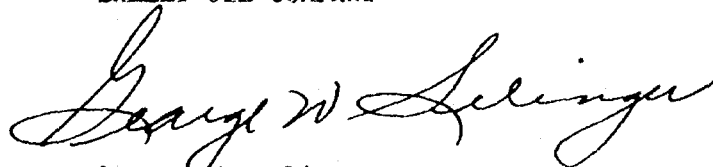
6. That applicant proposes to use as a primary source of injection fluids fresh water from the Ogalalla formation present in the area, supplementing said water with produced water from the San Andres formation as the flood progresses.

Applicant proposes to inject initially between 8,000 barrels and 10,000 barrels of water per day.

WHEREFORE, PREMISES CONSIDERED, applicant prays that this Commission, after the giving of notice as required by law, set this application down for hearing and that at the conclusion of said hearing based on the evidence produced, that it issue an order authorizing applicant to inject fluid and conduct secondary recovery operations within the Lovington San Andres Unit by authorizing the injection of water into 17 wells in the unit area, provide for the expansion of the secondary recovery project without the necessity of further hearings, and other rules and regulations, and orders as may be necessary in the premises.

Respectfully submitted,

SKELLY OIL COMPANY

A handwritten signature in cursive script, reading "George W. Selinger".

George W. Selinger  
Its Attorney

Of Counsel  
L. C. White  
Gilbert, White & Gilbert  
Santa Fe, New Mexico

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GILBERT, WHITE AND GILBERT  
ATTORNEYS AT LAW  
SANTA FE, NEW MEXICO

BEFORE THE NEW MEXICO OIL CONSERVATION COMMISSION

IN THE MATTER OF THE APPLICATION OF )  
SKELLY OIL COMPANY FOR AUTHORITY TO )  
INJECT FLUID INTO THE SAN ANDRES )  
FORMATION IN THE LOVINGTON SAN ANDRES )  
FIELD, LEA COUNTY, NEW MEXICO. )

Case No. \_\_\_\_\_

ENTRY OF APPEARANCE

Comes now L. C. WHITE of GILBERT, WHITE AND GILBERT, Santa Fe, New Mexico,  
and herewith enters his formal appearance in the above application as resident  
counsel for Skelly Oil Company.

  
\_\_\_\_\_  
L. C. WHITE



STATE OF NEW MEXICO

STATE ENGINEER OFFICE

SANTA FE

S. E. REYNOLDS  
STATE ENGINEER

November 6, 1962

ADDRESS CORRESPONDENCE TO:  
STATE CAPITOL  
SANTA FE, N. M.

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

*File Case  
2592*

Dear Mr. Porter:

Reference is made to your Order No. R-2278 which resulted from your hearing on OCC case 2592. I enclose a letter from Mr. H. E. Aab of Skelly Oil Company pertaining to this matter, which sets forth the new numbers applied to the wells since the hearing and their change in plan of injection equipment. This office offers no objection to the granting of this request so long as the wells receiving recycled water are equipped with plastic coated tubing as set forth in Mr. Aab's letter.

Yours very truly,

S. E. Reynolds  
State Engineer

FEI/ma  
cc-Skelly Oil Co.  
Attn. Mr. H. E. Aab

F. H. Hennighausen

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



# SKELLY OIL COMPANY

P.O. Box 38, Hobbs, New Mexico  
November 1, 1962

1962 NOV -5 AM 8:25  
STATE ENGINEER OFFICE  
SANTA FE, N.M.

*Irby*

Subject: Lovington San Andres Unit  
Lea County, New Mexico

Mr. Frank E. Irby  
Chief  
Water Rights Division  
State Capitol  
Santa Fe, New Mexico

BEST AVAILABLE COPY

Dear Sir:

With reference to our letter of October 22, 1962, all of the produced brine water from the subject unit will be injected into the following wells:

<u>Unit Well No.</u>	<u>Former Lease Name and Well No.</u>
L.S.A. Unit Well No. 34	Sunray Caylor No. 1
L.S.A. Unit Well No. 36	Skelly C. S. Caylor No. 1
L.S.A. Unit Well No. 50	Pan American Caylor No. 1
L.S.A. Unit Well No. 55	Shell State "A" No. 1

As stated in our letter, the tubing in these wells will be internally plastic coated and injection will be below a packer.

Fresh water from the Ogallala formation will be injected down the remainder of the injection wells which are as follows:

<u>Unit Well No.</u>	<u>Former Lease Name and Well No.</u>
L.S.A. Unit Well No. 4	Skelly State "N" No. 1
L.S.A. Unit Well No. 6	Late Graham No. 1
L.S.A. Unit Well No. 14	Skelly State "O" No. 2
L.S.A. Unit Well No. 16	Skelly State "O" No. 4
L.S.A. Unit Well No. 18	Tidewater State "T" No. 2
L.S.A. Unit Well No. 28	Pan American State "P" No. 10
L.S.A. Unit Well No. 30	Pan American State "P" No. 3
L.S.A. Unit Well No. 32	Amerada State "LA" No. 6
L.S.A. Unit Well No. 46	Amerada State "LA" No. 7
L.S.A. Unit Well No. 48	Mobil State "M" No. 1
L.S.A. Unit Well No. 58	Mobil State "M" No. 4
L.S.A. Unit Well No. 54	(To be drilled) Tidewater State "T"

Injection into these wells will be thru uncoated tubing under packer. Corrosion coupons will be installed at the well head of these wells. Coupons will be changed weekly during the first few months of operation. As stated before, frequency of change after the first few months will depend on results of



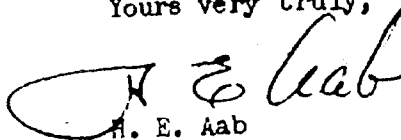
# SKELLY OIL COMPANY

Mr. Frank E. Irby  
Page 2

coupon analysis. Absolutely no produced brine water will be injected thru uncoated tubing.

All injection wells have been drilled except unit well No. 54 which will be drilled at a location 1980' FSL and 1980' FEL, Section 36, Township 16 South, Range 36 East, Lea County, New Mexico.

Yours very truly,

  
H. E. Aab

HFA/LDJ/pjn

LOVINGTON - SAN ANDRES  
SECONDARY RECOVERY STUDY

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- I. Object
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- III. Recommendations
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    - 2. Unitization and Participation
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## LOVINGTON - SAN ANDRES

### I. Object:

This study was made by the Lovington-San Andres Engineering Sub-committee for the following purposes:

- A. To study economics of waterflooding the subject pool.
- B. To determine participation parameters applicable to the proposed unit.
- C. To outline a program for secondary recovery by waterflooding.

### II. Conclusions:

- A. An economically successful secondary recovery project for the subject pool is expected.
- B. Ultimate primary recovery by depletion will recover approximately 9.25 million stock tank barrels of oil.
- C. Waterflood operations are expected to result in approximately 10 million barrels of secondary oil.
- D. The flood program as outlined is expected to result in top allowable unit oil production of 42 barrels per day per unitized well.
- E. Adequate water is available for operating the unit as outlined.

### III. Recommendations:

- A. The subject area should be unitized to promote effective secondary recovery from the Lovington-San Andres reservoir.
- B. A full-scale water injection program as proposed should be instituted at the earliest possible date.
- C. Within the unit area, all plugged and abandoned San Andres wells should be recompleted and San Andres wells completed on those tracts where none are now present.

### IV. Discussion:

#### A. History

The Lovington-San Andres pool is located in central Lea County, New Mexico, approximately six (6) miles south of Lovington and ten (10) miles northwest of Hobbs. Discovery of the pool was by completion of the Skelly Oil Company State "N" Well No. 1, Unit B - Section 36, T16S-R36E, in January, 1939.

Early development of the field was rapid. Within the horizontal limits of the proposed unit area (shown on Figure No. 1), 58 San Andres producers, on regular 40-acre spacing, have been completed. Of this number, 49 wells continue to produce, with 4 wells plugged and abandoned, and 5 wells shut-in or temporarily abandoned. Average production from the pool during the last half of 1961 was 7 barrels per day per producing well.

#### B. General Reservoir and Fluid Properties

The Lovington San Andres reservoir is contained within a small domal type anticline, shown on the Structure Map, Figure No. 2. The productive formation, a San Andres dolomite of Permian Age, is a hard, dense crystalline dolomite with intermittent streaks of gray shale, anhydrite and sand.

Production limits of the pay formation are defined by lack of permeability and porosity development on the flanks of the reservoir and bottom water in the formation. Analysis of sample logs of the San Andres wells, and electric and radioactivity logs of twin wells in the field, revealed that the pay section averages 38 feet in thickness. Study of the available data indicates several separate pay zones of fairly continuous nature throughout the field. The continuity of these zones, as exhibited on the included cross sections (Figures No. 3 and No. 4), enhance the floodability prospects of the San Andres formation.

The producing mechanism is predominantly of the solution gas drive type. Production and completion histories have yielded no evidence of either active water drive or extensive gas cap effect. Water was encountered near the bottom of the San Andres formation in some wells. Exclusion of the water by plugging back during completion was easily accomplished; no evidence of extensive water encroachment has been observed subsequent to completion.

The only core analysis available, that of the Pan American's State "E" Tract No. 18, Well No. 6, yielded the following weighted average values:

Porosity	8.6%
Permeability	6.4 Millidarcies
Connate Water Saturation	30.0%

Volumetric calculations indicate that original oil in place was 37,600,000 STBO.

#### C. Primary Performance

Primary performance curves are shown on Figure No. 5. Primary depletion of the reservoir is approaching the economic limit.

Ultimate primary production was determined at 9,001,334 barrels stock tank oil by the Engineering Sub-committee. This figure includes production as reported by each operator on New Mexico Oil Conservation Commission's Forms C-115, and remaining primary reserves extrapolated from lease decline curves.

On October 1, 1961, cumulative production from the Lovington-San Andres pool was 8,269,956 barrels. Remaining primary reserves were determined at 731,378 barrels.

D. Secondary Recovery

1. Waterflood

In its present depleted state, waterflooding is considered the most practical means of effecting secondary recovery from the Lovington San Andres reservoir.

Calculations indicate that 10,031,500 barrels of secondary oil may be produced during a sixteen (16) year period. Projected secondary performance curves are shown on Figure No. 6.

An inverted nine-spot flood pattern (with injection wells as shown on Figure No. 1) is planned for the unitized area. Such a pattern should adequately flood the formation; will, under present regulations allow the unit to be produced at top allowable of 42 barrels per day per unitized well; and should facilitate control of secondary production within proration limits, as defined by the New Mexico Oil Conservation Commission.

2. Unitization and Participation

When unitization becomes effective, Skelly Oil Company will become Operator of the Lovington-San Andres Unit.

The Working Interest Owners have agreed that the following parameters be used as an equitable method of determining participation percentages in the proposed unit:

(a) Primary Participation:

- (1) 70% of each tract's current production (production from 1-1-60 to 10-1-61).
- (2) 20% of each tract's remaining primary reserves, as of 10-1-61.
- (3) 10% of each tract's adjusted ultimate primary production.

(b) Secondary Participation:

Each tract's percentage of adjusted ultimate primary production.

The adjusted ultimate primary production for the pool, as used in the above formula, includes all production reported on New Mexico Oil Conservation Commission's Forms C-115 from date of discovery to October 1, 1961; remaining primary reserves as of October 1, 1961, estimated by the Engineering Sub-committee from lease decline curves; and primary estimates for the seven (7) tracts on which no San Andres wells now exist, calculated on the basis of performance of offset wells to these tracts.

The primary participation percentages will be used as the basis for allocating returns from production among the Working Interest Owners until a total of 9,001,334 barrels of stock tank oil have been produced from the San Andres reservoir; after ultimate primary recovery has been achieved, the secondary participation percentages will become effective as the basis of allocation.

### 3. Plan of Waterflood

The proposed unit area contains some tracts on which drilling and recompletion work will be necessary before a full scale flood can be completely installed as presently planned. Sixty-one (61) basic 40-acre tracts, a total of 2469.81 acres, are included in the unit area, with 54 useable wells. The additional tracts are described below, along with their status as to useable San Andres wells.

Tracts on which no San Andres completion exists:

Unit L - Sec. 36-T16S-R36E  
Unit J - Sec. 36-T16S-R36E

Tracts on which San Andres wells were plugged and abandoned:

Unit O - Sec. 35-T16S-R36E  
Unit I - Sec. 2-T17S-R36E  
Unit J - Sec. 2-T17S-R36E  
Unit D - Sec. 5-T17S-R37E

A Queen-gas, Paddock-oil dual completion on Unit O - Section 1-T17S-R36E, will be recompleted in the San Andres formation and contributed to the unit.

Seventeen (17) injection wells and forty-four (44) producing wells will be utilized in flooding the San Andres formation. Initially, an inverted nine-spot injection pattern will be used, injecting 500 barrels of water per day per injection well. Proposed injection wells are designated on Figure No. 1

When flooding operations reach the point where those wells directly offsetting the injection wells designated on Figure No. 1 become economically useless as producing wells, they will be converted to injection wells. At the time when all direct offset wells to the presently proposed injection wells have been converted to injection wells, the flood pattern will have become a regular 160-acre nine-spot.

In most cases, the San Andres wells in the proposed unit are producing from open hole, with 5½ casing set above the pay section. The flood program will be initiated with injection into the open hole section. Study of flood performance will dictate the necessity of providing better control of the section injected by running liners and perforating at selected intervals.

Waters from two (2) oil producing formations, in addition to the San Andres, are present in the Lovington pool, and are produced at the following approximated rates:

Lovington Abo	1300 EWPB
Lovington Paddock	130 EWPB
Lovington San Andres	220 EWPB

These rates suggest that a considerable amount of makeup water would be required at the proposed injection rate of 8500 barrels per day in addition to produced waters from oil bearing formations in the area if these waters were used.

The unit operator proposes to use as the principle source of injection water the Ogalalla formation water present in the Lovington Pool area. As the flood progresses and produced water from the unitized San Andres formation increases, this water will be used with the fresh Ogalalla water as the injection fluid.

A water analyst's report on several water sources is included herein as Figures No. 8 and No. 8A, and indicates that the San Andres and fresh waters may be mixed compatibly for injection purposes. Slight incompatibility was noted, caused by oxygen in the fresh water sample. This effect can be eliminated, however, by use of a closed water supply system.

It is possible that filtration equipment at the injection plant will be required, but available data is not sufficient to definitely establish a necessity for filtering. This question can be more firmly resolved by conducting filter tests at selected injection wellheads after injection equipment has been installed.

On Figure No. 7 is shown the proposed location of the distribution system for the waterflood.

#### V. Maps, Reports and Graphical Data

- Figure No. 1 - Unit Area and Injection Pattern
- Figure No. 2 - Structure Map
- Figure No. 3 - East-West Cross Section
- Figure No. 4 - North-South Cross Section
- Figure No. 5 - Primary Performance
- Figure No. 6 - Projected Secondary Performance Curves
- Figure No. 7 - Distribution System
- Figure No. 8 - Water Analysis
- Figure No. 8A - Water Compatibility Tests

RESULTS OF WATER ANALYSIS

BEST AVAILABLE COPY

TO: Mr. J. B. ...

LABORATORY NO. 10000

SAMPLE RECEIVED 10-23-59

RESULTS REPORTED 10-31-59

COMPANY: ... LEASE: ...

FIELD OR POOL: ...

SEC. 34 ... SURVEY ... COUNTY: ... STATE: ...

SOURCE OF SAMPLE AND DATE TAKEN:

NO. 1 ... 10-23-59

NO. 2 ... 10-23-59

NO. 3 ... 10-23-59

NO. 4 ... 10-23-59

REMARKS:

CHEMICAL AND PHYSICAL PROPERTIES

	NO. 1	NO. 2	NO. 3	NO. 4
SPECIFIC GRAVITY AT 60°F	1.022	1.024	1.026	1.020
PH WHEN SAMPLED	7.2	7.3	7.7	7.2
PH WHEN RECEIVED	7.4	7.0	6.6	7.2
TOTAL ALKALINITY AS CaCO <sub>3</sub>	100	120	100	1,052
SATURATED DEFICIT AS CaCO <sub>3</sub>	0	35	20	52
UNDERSATURATION AS CaCO <sub>3</sub>	0	0	0	0
TOTAL HARDNESS AS CaCO <sub>3</sub>	200	155	120	1,104
CALCIUM AS CaCO <sub>3</sub>	100	75	60	1,000
MAGNESIUM AS CaCO <sub>3</sub>	100	80	60	1,000
SODIUM AND/OR POTASSIUM				
SULFATE AS SO <sub>4</sub>	100	2,000	320	2,950
CHLORIDE AS NaCl	50	10,000	32,000	35,000
SILICA AS SiO <sub>2</sub>	10.0	5.0	11.0	7.0
IRON AS Fe	0.00	2.70	1.00	0
MANGANESE AS Mn				
BARIUM AS Ba	0.00	0.00	0.00	0.00
TURBIDITY ELECTRIC	0	20.0	20.0	20.0
COLOR AS Pt	0	30.0	20.0	30.0
DISSOLVED SOLIDS AT 101°C				
TOTAL SOLIDS AT 101°C				
TEMPERATURE °F	60	100	100	100
CARBON DIOXIDE CALCULATED	10.0	10.0	10.0	10.0
DISSOLVED OXYGEN WINKLER	10.0	10.0	10.0	10.0
HYDROGEN SULFIDE	10.0	10.0	10.0	1,500
RESIDUAL CHLORINE	10.0	10.0	10.0	10.0
RESISTIVITY OHMS/CC	10,000	10	10	10

NOTE: All Results Reported as Parts Per Million. Divide by 17.1 to Convert to Grains Per Gallon.

Additional Determinations and Remarks: ...

By: ...

Treat-Pile Water Laboratories, Inc.  
 WATER CONSULTANTS SINCE 1936  
 BACTERIAL AND CHEMICAL ANALYSIS  
 P. O. BOX 548      PHONE WA 3-4781  
 MCNAMI, TEXAS

BEST AVAILABLE COPY

ANALYSIS	DATE	TIME
1. Total Solids	10/1/58	10:00 AM
2. Total Suspended Solids	10/1/58	10:00 AM
3. Total Dissolved Solids	10/1/58	10:00 AM
4. Total Hardness	10/1/58	10:00 AM
5. Calcium Hardness	10/1/58	10:00 AM
6. Magnesium Hardness	10/1/58	10:00 AM

ANALYST: [illegible]

10/1/58

# INJECTION WELL COMPLETION DATA - LOVINGTON SAN ANDRES UNIT

Operator & Lease	Well No.	Unit	Sec.	T	R	T.D.	Completion Interval	Surface Casing Size	Surface Casing Depth	Sx. Cement	Production Casing Size	Production Casing Depth	Sx. Cement	Logged	Remarks
Amerada															
State n/a	6	B	1	178	36E	4900'	4589-4900'	10-3/4"	288'	180	5-1/2"	4589'	200	No	
State n/a	7	L	1	178	36E	4946'	4624-4946'	10-3/4"	304'	175	5-1/2"	4624'	300	No	
Late Oil Co.															
Graham	1	D	-31	168	37E	5000'	4538-5000'	16"	257'	N.R.	7"	4538'	N.R.	No	
Koran															
Shipp State n/a	1	D	5	178	37E	4896' P.B.	4669-4896'	10-3/4"	300'	175	5-1/2"	4669'	400	Yes	Plugged & Abandoned
Pan American															
Caylor	1	L	6	178	37E	4960'	4587-4960'	10-3/4"	270'	200	5-1/2"	4587'	175	No	
State n/a Tr. 18	3	D	1	178	36E	4970'	4543-4970'	13"	265'	200	5-1/2"	4543'	300	No	
State n/a Tr. 18	10	B	2	178	36E	5041'	4602-5041'	13"	267'	175	5-1/2"	4602'	400	No	
DX Survey															
Caylor	1	D	6	178	37E	4950'	4521-4950'	13"	314'	200	7"	4521'	200	No	
Skelly															
Caylor	1	B	6	178	37E	4955'	4540-4955'	13"	336'	200	5-1/2"	4540'	125	No	
State n/a	1	B	36	168	36E	5012'	4634-5012'	13"	293'	200	7"	4634'	225	No	
State n/a	2	L	31	168	37E	5087'	4530-5087'	10-3/4"	314'	175	5-1/2"	4530'	150	No	
State n/a	4	J	31	168	37E	4950'	4605-4950'	13"	294'	175	5-1/2"	4605'	150	No	
Secony-Mobil															
State n/a	1	J	1	178	36E	4960'	4530-4960'	13"	311'	250	7"	4530'	225	No	Plugged & Abandoned
State n/a	4	J	2	178	36E	5130'	4822-4974'	14"	N.R.	N.R.	5-1/2"	4526'	250	No	Plugged & Abandoned
Tidewater															
State n/a	2	J	36	168	36E	5110'	4654-4900'	7"	350'	175	4-1/2"	5110'	300	Yes*	To be drilled
State n/a	2	L	32	168	37E	4900'		13"	318'	300	5-1/2"	4655'	400	Yes*	

N.R. - No Record  
\* - Not Available

BEFORE EXAMINER UTZ  
C. C. S. & S. COMMISSION  
CASE NO. 2552-2893

approval of a secondary recovery project, Lea County, NM.