Union Oil Company of California

205 EAST WASHINGTON AVENUE LOVINGTON, NEW MEXICO 88260

1890 1965 DIAMOND ANNIVERSARY

May 6, 1966

NW-230

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

Re: Expansion of Waterflood Project
South Caprock Queen Unit
Chaves County, New Mexico
(Case 2032, Orders R-1729 and R-1729-A)

Dear Mr. Porter:

Union Oil Company of California, as operator of the South Caprock Queen Unit in Chaves County, hereby requests administrative approval to convert four additional waterflood project area wells to water injection service. This request is submitted pursuant to the provisions of Rule 701 of the Rules and Regulations of the New Mexico Oil Conservation Commission.

The proposed injection wells are as follows:

1. Tract 42, Well 2-31, located in the NW/4 of the NE/4 (Unit B), Section 31, T-15S, R-31E, N.M.P.M.

2. Tract 57, Well 5-8, located in the SW/4 of the NW/4 (Unit E), Section 8, T-15S, R-31E, N.M.P.M.

3. Tract 5, Well 11-8, located in the NE/4 of the SW/4, (Unit K), Section 8, T-15S, R-31E, N.M.P.M.

4. Tract 54, Well 13-28, located in the SW/4 of the SW/4, (Unit M), Section 28, T-14S, R-31E, N.M.P.M.

All of the proposed injection wells are offset by stimulated producing wells. Each of the proposed injectors has reached the secondary economic limit. Conversion of the wells will form a regular five-spot injection pattern around six additional producing wells and should greatly improve the areal sweep efficiency in these areas of the reservoir. The location of the proposed injection wells and the offset stimulated wells is shown on the attached plat (Figure 1).

In support of this application, the following are attached:

EXHIBIT I: A plat of the South Caprock Queen Unit showing the location of all injection and producing wells. The proposed injection wells are identified on the plat. There are no offset operators who will be affected by the conversions since this is a unit operation.

EXHIBIT II: Commission Form C-116 showing production tests for the offsetting stimulated wells both before and after being affected by the waterflood.

EXHIBIT III: A table showing the casing program of the proposed injection wells.

EXHIBIT IV: Diagrammatic sketches of the proposed injection wells showing casing string details, cement tops and perforations. Also shown are the proposed tubing string details.

The proposed injection wells are either open hole completions in the Queen Sand or are perforated entirely in the Queen Sand. Injection water is either fresh water produced from the Ogallala Sand or produced Queen Sand brine. Anticipated injectivity for these wells is shown on Exhibit IV.

Water injection at the South Caprock Queen Unit commenced on May 23, 1961, into ten wells located along the gas-oil contact in the central portion of the unit. Since that time, the project has been expanded twenty-one times. As of April 1, 1966, 42,844,222 barrels of water have been injected into 84 wells.

Conversion of the four subject wells is recommended in order to improve pattern sweep efficiency in the reservoir.

By copy of this application, Mr. Irby of the State Engineer Office is being advised of the proposed well conversions. A copy of the transmittal letter to Mr. Irby is attached. Three copies of this letter and supporting data are transmitted herewith, as outlined in Rule 701. Please contact me if any additional data is required in support of this application.

Very truly yours,

Richard H. Butler

Richard H. Butler
Secondary Recovery Engineer

RHB:bn
Attachments
cc: Mr. Frank Irby
State Engineer Office

EXHIBIT II

C-116
Revised 1-1-65

NEW MEXICO OIL CONSERVATION COMMISSION
GAS – OIL RATIO TESTS

Operator: UNION OIL CO. OF CALIF.
Pool: SOUTH CAPROCK QUEEN UNIT
County: CHAVES COUNTY
Address: 205 EAST WASHINGTON, LOVINGTON, NEW MEXICO
TYPE OF TEST – (X): Scheduled ☐ Completion ☐ Special ☒ TESTS TO VERIFY WATERFLOOD STIMULATION

LEASE NAME		WELL NO.	LOCATION U	S	T	R	DATE OF TEST	STATUS	CHOKE SIZE	TBG. PRESS.	DAILY ALLOWABLE	LENGTH OF TEST HOURS	PROD. DURING TEST WATER BBLS.	GRAV. OIL	OIL BBLS.	GAS M.C.F.	GAS – OIL RATIO CU.FT/BBL
1. TRACT 49	*	3-31	C	31	15S	31E	1-26-65	P	—	—	6	24	0	—	3	TSTM	—
TRACT 49	***	3-31	C	31	15S	31E	4-30-66	P	—	—	6	24	1	—	37	TSTM	—
2. TRACT 48	*	15-30	O	30	15S	31E	8-6-64	P	—	—	18	24	4	—	29	TSTM	—
TRACT 48	**	15-30	O	30	15S	31E	12-30-64	P	—	—	80	24	10	—	510	TSTM	—
TRACT 48	***	15-30	O	30	15S	31E	4-26-66	P	—	—	175	24	342	—	14	TSTM	—
3. TRACT 63	*	6-8	F	8	15S	31E	6-1-62	P	—	—	30	24	0	—	11	TSTM	—
TRACT 63	**	6-8	F	8	15S	31E	12-23-62	P	—	—	120	24	0	—	136	TSTM	—
TRACT 63	***	6-8	F	8	15S	31E	4-26-66	P	—	—	25	24	608	—	19	TSTM	—
4. TRACT 57	*	10-8	J	8	15S	31E	10-22-62	P	—	—	40	24	0	—	5	TSTM	—
TRACT 57	**	10-8	J	8	15S	31E	10-22-63	P	—	—	40	24	2	—	54	TSTM	—
TRACT 57	***	10-8	J	8	15S	31E	4-27-66	P	—	—	40	24	85	—	11	TSTM	—
5. TRACT 5	*	14-8	N	8	15S	31E	4-15-62	P	—	—	150	24	0	—	5	TSTM	—
TRACT 5	**	14-8	N	8	15S	31E	5-31-63	P	—	—	347	24	0	—	330	TSTM	—
TRACT 5	***	14-8	N	8	15S	31E	4-25-66	P	—	—	75	24	355	—	27	TSTM	—
6. TRACT 54	*	14-28	N	28	14S	31E	12-13-64	P	—	—	6	24	0	—	3	TSTM	—
TRACT 54	***	14-28	N	28	14S	31E	4-25-66	P	—	—	3	24	12	—	54	TSTM	—

No well will be assigned an allowable greater than the amount of oil produced on the official test.

During gas-oil ratio test, each well shall be produced at a rate not exceeding the top unit allowable for the pool in which well is located by more than 25 percent. Operator is encouraged to take advantage of this 25 percent tolerance in order that well can be assigned increased allowables when authorized by the Commission.

Gas volumes must be reported in MCF measured at a pressure base of 15.025 psia and a temperature of 60° F. Specific gravity base will be 0.60.

Report casing pressure in lieu of tubing pressure for any well producing through casing.

Mail original and one copy of this report to the district office of the New Mexico Oil Conservation Commission in accordance with Rule 301 and appropriate pool rules.

* TEST PRIOR TO WATERFLOOD STIMULATION
** TEST AT PEAK STIMULATED RATE
*** TEST SHOWING CURRENT PERFORMANCE

I hereby certify that the above information is true and complete to the best of my knowledge and belief.

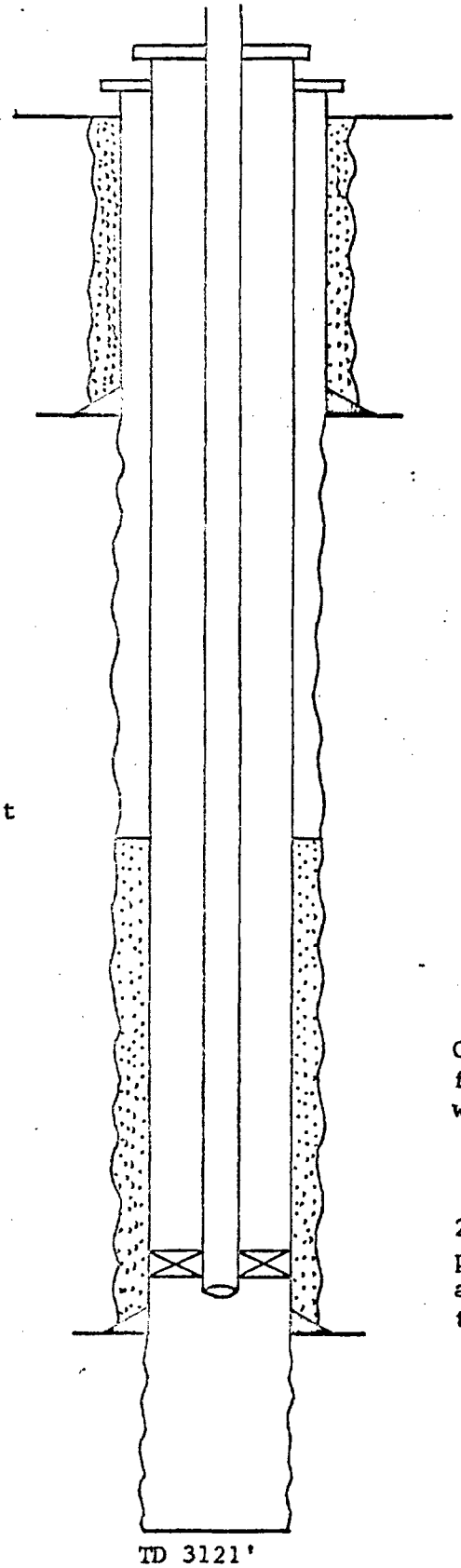
Richard H. Butler
RICHARD H. BUTLER (Signature)
SECONDARY RECOVERY ENGINEER (Title)
4-29-66 (Date)

EXHIBIT III
SOUTH CAPROCK QUEEN UNIT
CASING PROGRAM OF PROPOSED INJECTION WELLS

	Tract 42 Well 2-31	Tract 57 Well 5-8	Tract 5 Well 11-8	Tract 54 Well 13-28
TD	3095'	3121'	3103'	2930'
ETD	3095'	3121'	3103'	2911'
Open Hole Sections	3087-3095'	3089-3121'	3090-3103'	-
Perforations	-	-	-	2895-2900'
Surface Casing				
Size	13-3/8"	10-3/4"	10-3/4"	8-5/8"
Setting Depth	250'	317'	315'	206'
Cement, sacks	200	150	250	125
Circulated?	Yes	Yes	Yes	Yes
Grade Pipe	J-55	J-55	J-55	J-55
Weight, Lbs/Ft.	36.5	32	32.75	24
Age, years	10	10	11	8
Condition	New	New	New	New
Oil String				
Size	5-1/2"	7"	7"	5-1/2"
Setting Depth	3087'	3089'	3090'	2929'
Cement, sacks	150	100	100	300
Grade Pipe	J-55	J-55	J-55	J-55
Weight, Lbs/Ft.	14	23 & 26	17 & 20	14
Age, years	10	est. 15	11	8
Condition	New	Used, good	New	New

SOUTH CAPROCK QUEEN UNIT

Tract 57, Well 5-8



Anticipated Injectivity
= 400 B/D at 1300 psig

10-3/4" c 317'
w/150 sacks
(circulated)

Calculated Top of Cement
2424'

7" c 3089' w/100 sacks

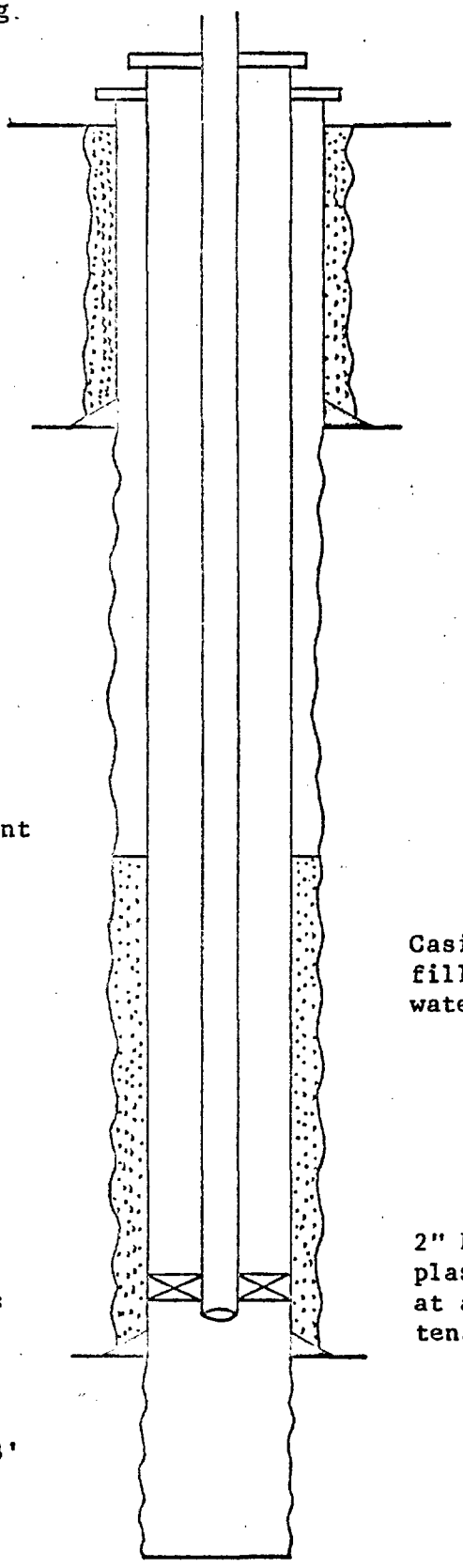
Open Hole 3089'-3121'

Casing-Tubing annulus
filled with inhibited
water

2" EUE, 8 rt. J-55
plastic-lined tubing
at about 3080' with
tension packer on bottom

SOUTH CAPROCK QUEEN UNIT
Tract 5, Well 11-8

Anticipated Injectivity
= 500 B/D at 1300 psig.



10-3/4" c 315'
w/250 sacks
(circulated)

Calculated Top of Cement
2425'

Casing-Tubing annulus
filled with inhibited
water

2" EUE, 8 rt, J-55
plastic-lined tubing
at about 3080' with
tension packer on bottom

7" c 3090' w/100 sacks

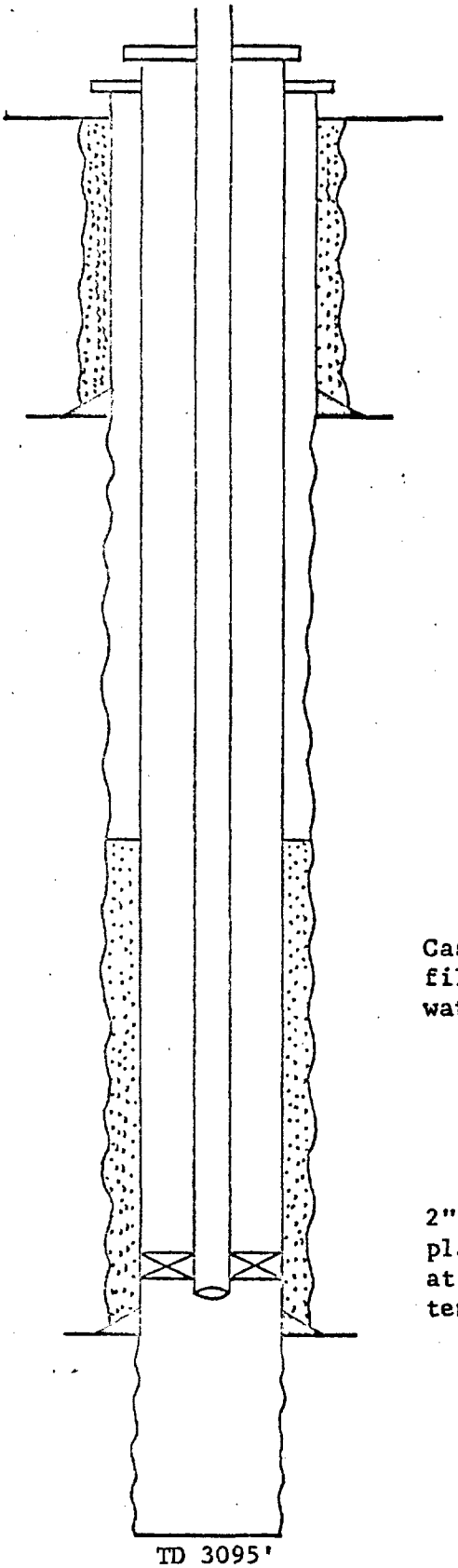
Open Hole 3090'-3103'

TD 3103'

SOUTH CAPROCK QUEEN UNIT

Tract 42, Well 2-31

Anticipated Injectivity
= 500 B/D at 1300 psig



13-3/8" c 250'
w/200 sacks
(circulated)

Calculated Top of Cement
2225'

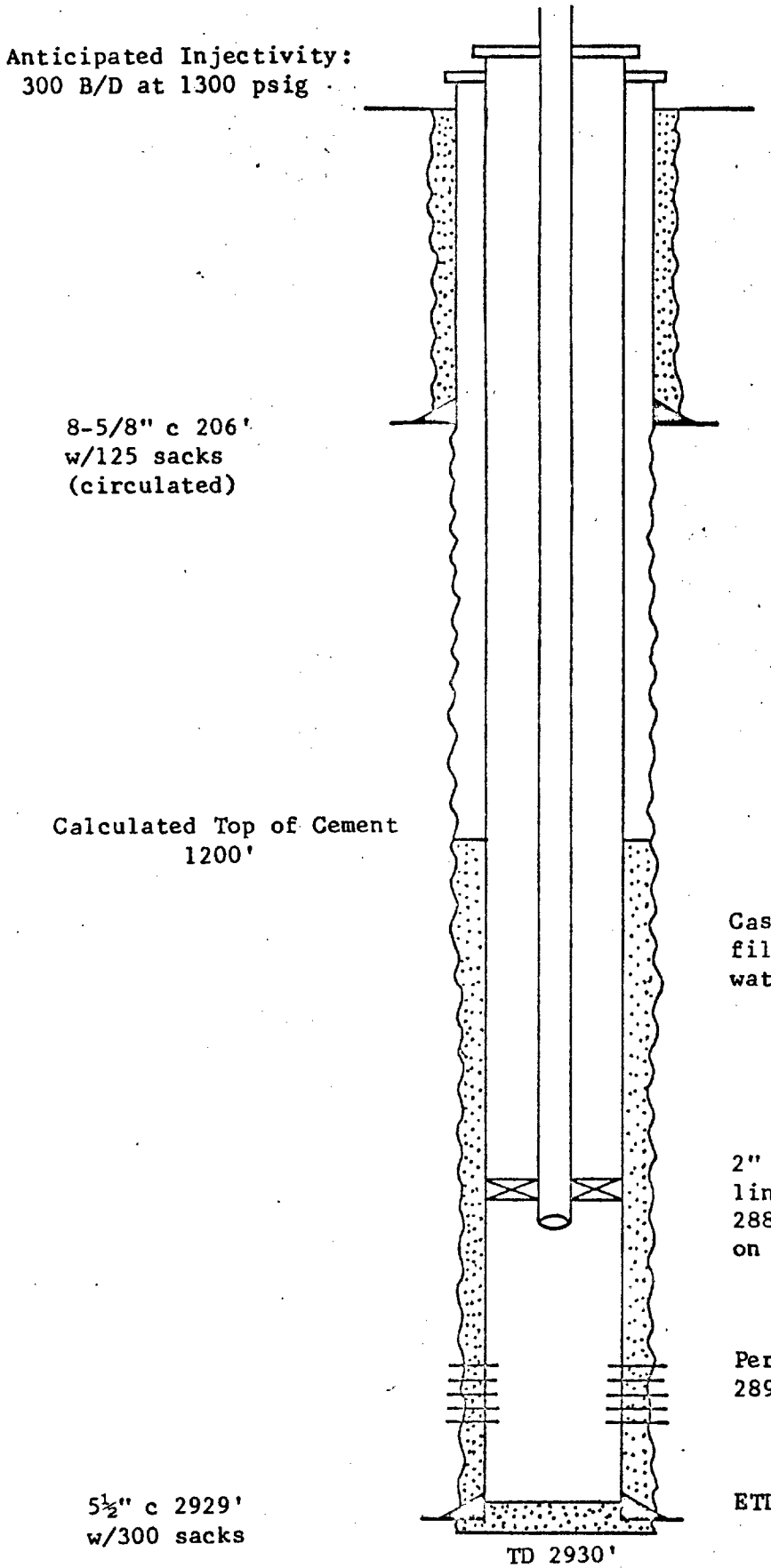
Casing-Tubing annulus
filled with inhibited
water

2" EUE, 8 rt, J-55
plastic-lined tubing
at about 3080' with
tension packer on bottom

5½" c 3087' w/150 sacks

Open Hole 3087'-3095'

SOUTH CAPROCK QUEEN UNIT
Tract 54, Well 13-28



Union Oil Company of California

205 EAST WASHINGTON AVENUE LOVINGTON, NEW MEXICO 88260

May 6, 1966

Mr. Frank Irby
Chief of Water Rights Division
State Engineer Office
State Capitol Building
Santa Fe, New Mexico

Re: Casing Data on Proposed Water Injection Wells, South Caprock Queen Unit, Chaves County, New Mexico

Dear Mr. Irby:

Attached please find a copy of an application submitted by the Union Oil Company of California to the New Mexico Oil Conservation Commission requesting administrative approval to convert four wells in the South Caprock Queen Unit to water injection service. This application is submitted in accordance with the provisions of Rule 701 of the Rules and Regulations of the New Mexico Oil Conservation Commission.

Exhibit III of the attached application is a table of casing information on the proposed injection wells. The wells will be completed with plastic-lined tubing with tension packers on bottom. The packers will be set just above the perforations or open hole section in the Queen Sand. The annulus betweeen the oil string and the tubing will be filled with an inhibited water for protection against corrosion. The maximum anticipated surface injection pressure for the wells will be about 1300 psig. Included in Exhibit III are data on the age, grade, and condition of the various casing strings in these wells.

If you are in agreement with this proposal, we would appreciate your so notifying the Secretary-Director of the New Mexico Oil Conservation Commission as soon as possible. Thank you for your consideration of this matter.

Very truly yours,

Richard H. Butler

Richard H. Butler
Secondary Recovery Engineer

RHB:bn
Attachments
cc: Mr. A. L. Porter, Jr. (3)✓

STATE OF NEW MEXICO

STATE ENGINEER OFFICE

SANTA FE

S. E. REYNOLDS
STATE ENGINEER

May 13, 1966

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

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

MAIN OFFICE O C D

'66 MAY 16 AM 8 25

Dear Mr. Porter:

Reference is made to the application of Union Oil Company of California which seeks authority to expand their Waterflood Project in the South Caprock Queen Unit (Case 2032, Orders R-1729 and R-1729-A). The proposed injection wells are as follows:

1. Tract 42, Well 2-31, located in the NW¼ of the NE¼ (Unit B), Section 31, T-15S, R-31E, N.M.P.M.

2. Tract 57, Well 5-8, located in the SW¼ of the NW¼ (Unit E), Section 8, T-15S, R-31E, N.M.P.M.

3. Tract 5, Well 11-8, located in the NE¼ of the SW¼ (Unit K), Section 8, T-15S, R-31E, N.M.P.M.

4. Tract 54, Well 13-28, located in the SW¼ of the SW¼ (Unit M), Section 28, T-14S, R-31E, N.M.P.M.

In view of the information summarized in paragraph two of Mr. Butler's May 6 letter to me (a copy of which was sent to you) it appears that no threat of contamination will result from the operation. Therefore, this office offers no objection to the granting of the application.

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

Yours truly,

S. E. Reynolds
State Engineer

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