

Tenneco Oil Exploration and Production

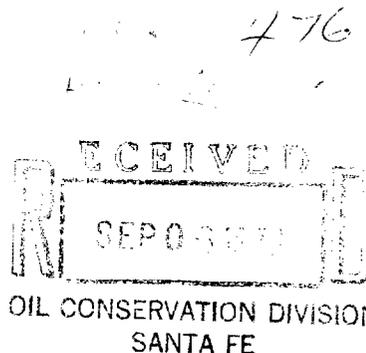
A Tenneco Company



Southwestern Division

6800 Park Ten Blvd. • Suite 200 North
San Antonio, Texas 78213
(512) 734-8161

August 29, 1979



New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

Gentlemen:

Tenneco Oil Company makes application to convert six producing wells to water injection for secondary recovery by waterflood on Leonard Federal and Leonard Brothers leases (USGS Lease No. NM-7951) in Sections 13 and 14, Township 26 South, Range 37 East, Leonard Queen Pool, Lea County, New Mexico. On March 21, 1978 a hearing was held at Santa Fe, New Mexico, Case No. 6161 requesting approval of two waterflood projects and an administrative procedure. The resulting Order No. R-5675 is attached as Exhibit "I".

The six proposed injection wells are Leonard Federal Nos. 9, 10, 11, 13 and Leonard Brothers Nos. 14 and 21 as shown on Exhibit I. Before injection begins in the six wells for which approval is requested, the following work will be completed:

- 1) Internally plastic coated tubing and packer will be run in each well and set at approximately 100 feet above the perforations.
- 2) The casing-tubing annulus in each well will be filled with an inert fluid and a connection for pressure gauge will be installed to permit determination of leakage.
- 3) The surface injection pressure will be limited to 680 pounds until such time approval is obtained for a higher pressure.
- 4) The wells will be equipped to facilitate periodic testing of the bradenhead for pressure or fluid production.

Per Exhibit "A" of New Mexico Oil Conservation Order No. R-5675 (Exhibit No. I), there are five wells which may or may not be plugged adequately. Three of the wells are outside the one-half mile distance to the wells we propose converting to water injection. The three wells, Ralph Lowe No. 2, Stanolind Oil Co. Leonard Oil No. 2, and the Midwest Refining Co.

Farnsworth No. 19 in Section 12, will all be addressed at the appropriate time when later phases of the waterflood are initiated. These wells are marked on Exhibit II which is a map showing all wellbores in the South Leonard area.

You will find attached a copy of the request to the USGS for renewal of the permit to re-enter Leonard Brothers No. 14 (Exhibit III). We plan to re-enter the well, deepen and case it to 3600'. The current wellbore schematic is on Exhibit IV, and the proposed wellbore configuration is on Exhibit V. Perforations will be selected from logs to be run, treatment performed, and a packer set +100' above the perforations to commence water injection.

The Midwest Refining Company Farnsworth No. 19 in Section 14 will be re-entered and cleaned out to 2900' to be plugged to abandon. Exhibit VI is a wellbore schematic showing the current downhole condition of the well. We plan to plug it with 100' plugs - 50' above and 50' below each casing shoe and casing cutoff point. Exhibit VII is the proposed wellbore schematic.

Exhibits VIII-XII are Wellbore Schematics of Leonard Federal Nos. 9, 10, 11, 13 and Leonard Brothers No. 21, respectively. Exhibit XIII includes copies of all the Form 9-331s sent to the USGS for each proposed injector.

In support of this application we have enclosed:

- a) a plat showing the location of the proposed wells, all wells within the project area and offset operators;
- b) a schematic drawing of each of the proposed injection wells which fully describes the casing, tubing, perforated interval, and appropriate depths.
- c) a copy of the letter sent to all offset operators in which said operators were furnished a copy of this application.

An archaeological study was performed by Dr. J. Loring Haskell of Carlsbad, New Mexico, which you should have received a copy of his report stating that the right-of-ways for injection lines were archaeologically approved for our work. He has not yet looked at the Leonard Brothers No. 14, but he will and mail you the results. Upon your approval of conversion of the six wells to water injection we will commence laying the injection lines per Exhibit II.

We estimated secondary recovery from this project to be 663 MBO. The six wells previously discussed will constitute a pilot waterflood area

New Mexico Oil Conservation Commission
August 29, 1979
Page 3

to give us a better indication of secondary reserves for Tenneco's acreage and will also give us a better idea of any preferential flooding.

The foregoing meets the requirements contained in Order No. R-5675 (a copy of this is enclosed); therefore, we respectfully request approval of this application.

Yours very truly,

TENNECO OIL COMPANY



J. G. Strother
Division Production Manager

MJ/mb
Attachments

cc: United States Department of the Interior
Geological Survey
Conservation Division
414 W. Taylor
Hobbs, New Mexico 88240

Texas Pacific Oil Company, Inc.
1700 One Main Place, Dallas, Texas 75250

Texaco Inc.
P. O. Box 3109, Midland, Texas 79702

The Petroleum Corporation
3303 Lee Parkway, Dallas, Texas 75219

Bettis, Boyle and Stovall
Box 1168, Graham, Texas 76046

Herman J. Ledbetter
1002 Sayles Boulevard, Abilene, Texas 79605

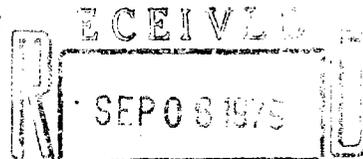
Yates Petroleum Corporation
207 South 4th Street, Artesia, New Mexico 88210

El Paso Natural Gas Company
P. O. Box 1492, 304 Texas Street, El Paso, Texas 79978

LIST OF EXHIBITS

- I. Order No. 5675
- II. Map of South Leonard Area Operators and Wells
- III. Copy of letter and request for renewed permit to re-enter Leonard Bros. No. 14
- IV. Leonard Bros. No. 14 Current Wellbore Schematic
- V. Leonard Bros. No. 14 Proposed Wellbore Schematic
- VI. Midwest Refining Co. Farnsworth No. 19 Current Wellbore Schematic
- VII. Midwest Refining Co. Farnsworth No. 19 Proposed Wellbore Schematic
- VIII. Leonard Federal No. 9 Proposed Wellbore Schematic
- IX. Leonard Federal No. 10 Proposed Wellbore Schematic
- X. Leonard Federal No. 11 Proposed Wellbore Schematic
- XI. Leonard Federal No. 13 Proposed Wellbore Schematic
- XII. Leonard Brothers No. 21 Proposed Wellbore Schematic
- XIII. Copies of Form 9-331's for Proposed Injectors

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



OIL CONSERVATION DIVISION CASE NO. 6161
SANTA FE Order No. R-5675

APPLICATION OF TENNECO OIL COMPANY FOR
TWO WATERFLOOD PROJECTS AND AN ADMINISTRATIVE
PROCEDURE, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on February 22, 1978, at Santa Fe, New Mexico, before Examiner, Richard L. Stamets.

NOW, on this 21st day of March, 1978, 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, Tenneco Oil Company, seeks authority to institute a waterflood project on its Leonard Federal Lease by the injection of water into the Queen formation through one well in Unit O of Section 11, and on its Leonard Brothers Lease through two wells, in Units I and M, respectively, of Section 14, all in Township 26 South, Range 37 East, Leonard-Queen Pool, Lea County, New Mexico.

(3) That wells within the proposed project areas experience rapid declines in production rates and require the institution of secondary recovery for continued production.

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

(5) That injection into any well authorized under the terms of this order should be through internally coated tubing set in a packer to be located within approximately 100 feet of the uppermost perforation or, in the case of an open-hole completion, the casing shoe.

EXHIBIT I

(6) That the casing-tubing annulus in each injection well should be filled with an inert fluid, and that a pressure gauge or approved leak detection device should be attached to the annulus or the annulus should be left open in order to determine leakage in the casing, tubing, or packer.

(7) That the injection wells or system should be equipped with a pressure limiting switch or other acceptable device which will limit the surface injection pressure to no more than 680 pounds unless the Secretary-Director of the Commission should administratively authorize a higher pressure.

(8) That there are five wells, as set out on Exhibit A to this order, which are located within or immediately adjacent to the boundaries of the proposed projects which may or may not be plugged in such a manner that will assure that they will not serve as channels for injected water to migrate from the Queen formation to other formations or to the surface.

(9) That to prevent migration of injected water from the Queen formation, formation injection pressure at wells within one half mile of any well identified on said Exhibit A should be limited to hydrostatic pressure until such time as the wells on said Exhibit A have been replugged or it shall otherwise be demonstrated to the satisfaction of the Secretary-Director of the Commission that the same will not serve as avenues of escape for such waters.

(10) That the wells within the project should be equipped to facilitate periodic testing of the annular space between strings of production and surface casing.

(11) That the operator should take all other steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface from injection, producing, or plugged and abandoned wells.

(12) That approval of the subject application should result in the recovery of additional volumes of oil from the proposed projects, thereby preventing waste.

(13) That the applicant further seeks the establishment of an administrative procedure for the addition of injection wells and the conversion of existing wells to injection at both orthodox and unorthodox locations without further notice and hearing.

(14) That the establishment of such an administrative procedure would permit the more efficient operation of the proposed project.

(15) That any injection well authorized by such an administrative procedure should be subject to all of the requirements and limitations contained in this order.

(16) That the application for waterflood projects and an administrative procedure should be approved.

IT IS THEREFORE ORDERED:

(1) That the applicant, Tenneco Oil Company, is hereby authorized to institute a waterflood project on its Leonard Federal Lease by the injection of water into the Queen formation through its Leonard Federal Well No. 6 in Unit O of Section 11, and to institute another waterflood project on its Leonard Brothers Lease by the injection of water into the Queen formation through its Leonard Brothers Well No. 2 and Well No. 7, located in Units I and M, respectively, of Section 13, all in Township 26 South, Range 37 East, Leonard-Queen Pool, Lea County, New Mexico.

(2) That injection into any well on either of said leases shall be through internally coated tubing installed in a packer to be located within approximately 100 feet of the uppermost perforation or, in the case of an open-hole completion, the casing shoe.

(3) That the casing-tubing annulus in each injection well shall be filled with an inert fluid and a pressure gauge or approved leak detection device shall be attached to the annulus or the annulus allowed to remain open in order to determine leakage in the casing, tubing, or packer.

(4) That the injection wells or system shall be equipped with a pressure limiting switch or other acceptable device which will limit the surface injection pressure to no more than 680 pounds.

(5) That the Secretary-Director of the Commission may administratively authorize a pressure limitation in excess of that set out in Order No. (4) above upon a showing by the operator that such higher pressure will not result in fracturing of the confining strata.

(6) That the applicant shall not inject water into the Queen formation through any well located within one half mile of any of the five wells identified on Exhibit A attached hereto and by reference made a part hereof, at a pressure greater than hydrostatic until such well has been replugged or it has been shown to the satisfaction of the Secretary-Director of the Commission that such well will not serve as an avenue of escape for waters injected into the Queen formation, and he has authorized a higher than hydrostatic pressure.

(7) That the wells within the project area shall be equipped with risers or in another acceptable manner such as to facilitate the periodic testing of the bradenhead for pressure or fluid production.

(8) That the operator shall immediately notify the supervisor of the Commission district office at Hobbs of the failure of the tubing or packer in any of said injection wells, the leakage of water or oil from or around any producing well, the leakage of water or oil from or around any plugged and abandoned well within the project area, or any other evidence of fluid migration from the injection zone, and shall take such timely steps as may be necessary or required to correct such failure or leakage.

(9) That the subject waterflood projects are hereby designated the Tenneco Oil Company Leonard Federal Waterflood Project and Leonard Brothers Waterflood Project, respectively, and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

(10) That monthly progress reports of the waterflood projects herein authorized shall be submitted to the Commission in accordance with Rules 704 and 1115 of the Commission Rules and Regulations.

(11) The Secretary-Director of the Commission is hereby authorized to approve such additional producing wells and injection wells at orthodox and unorthodox locations within the boundaries of applicant's Leonard Federal and Leonard Brothers Leases in Sections 11, 12, 13, and 14, Township 26 South, Range 37 East, NMPM, as may be necessary to complete an efficient production and injection pattern, provided said wells are drilled no closer than 330 feet to any lease line nor closer than 10 feet to any quarter-quarter section or subdivision inner boundary. To obtain such approval, the project operator shall file proper application with the Commission, which application, if it seeks authorization to convert additional wells to injection or to drill additional production or injection wells shall include the following:

- (a) A plat showing the location of the proposed well, all wells within the project area, and offset operators, locating wells which offset the project area.
- (b) A schematic drawing of the proposed well which fully describes the casing, tubing, perforated interval, depth, and a demonstration that any proposed injection well will meet construction, pressure and monitoring provisions of Orders Nos. (2), (3), (4), (6), and (7) of this Order or the equivalent.
- (c) A letter stating that all offset operators to the proposed well have been furnished a complete copy of the application and the date of notification.

The Secretary-Director of the Commission may approve the proposed well if, within 20 days after receiving the application, no objection to the proposal is received. The Secretary-Director may grant immediate approval, provided waivers of objection are received from all offset operators.

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

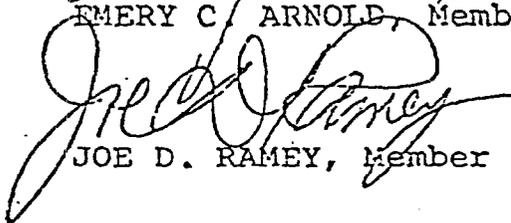
DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

PHIL R. LUCERO, Chairman



EMERY C. ARNOLD, Member



JOE D. RAMEY, Member & Secretary

S E A L

Ralph Lowe	Self	2	E	7	26S	38E
✓ Stanolind Oil Co.	Leonard Oil Co.	2	A	12*	26S	37E
Midwest Refining Co.	Farnsworth	19	M	12	26S	37E
≠ Tenneco Oil Co.	Leonard Bro.	14	B	14	26S	37E
-✓ Midwest Refining Co.	Farnsworth	19	M	14	26S	37E

Case No. 6161
Order No. R-5675

Exhibit A

- PROPOSED QUEEN-PENROSE INJECTORS
- CURRENT TENNECO WATER INJECTION WELL
- TANSILL YATES 7 RIVERS
- RHODES STORAGE AREA
- QUEEN/PENROSE
- YATES 7 RIVERS
- WELLS TO RE-PLUG & ABANDON

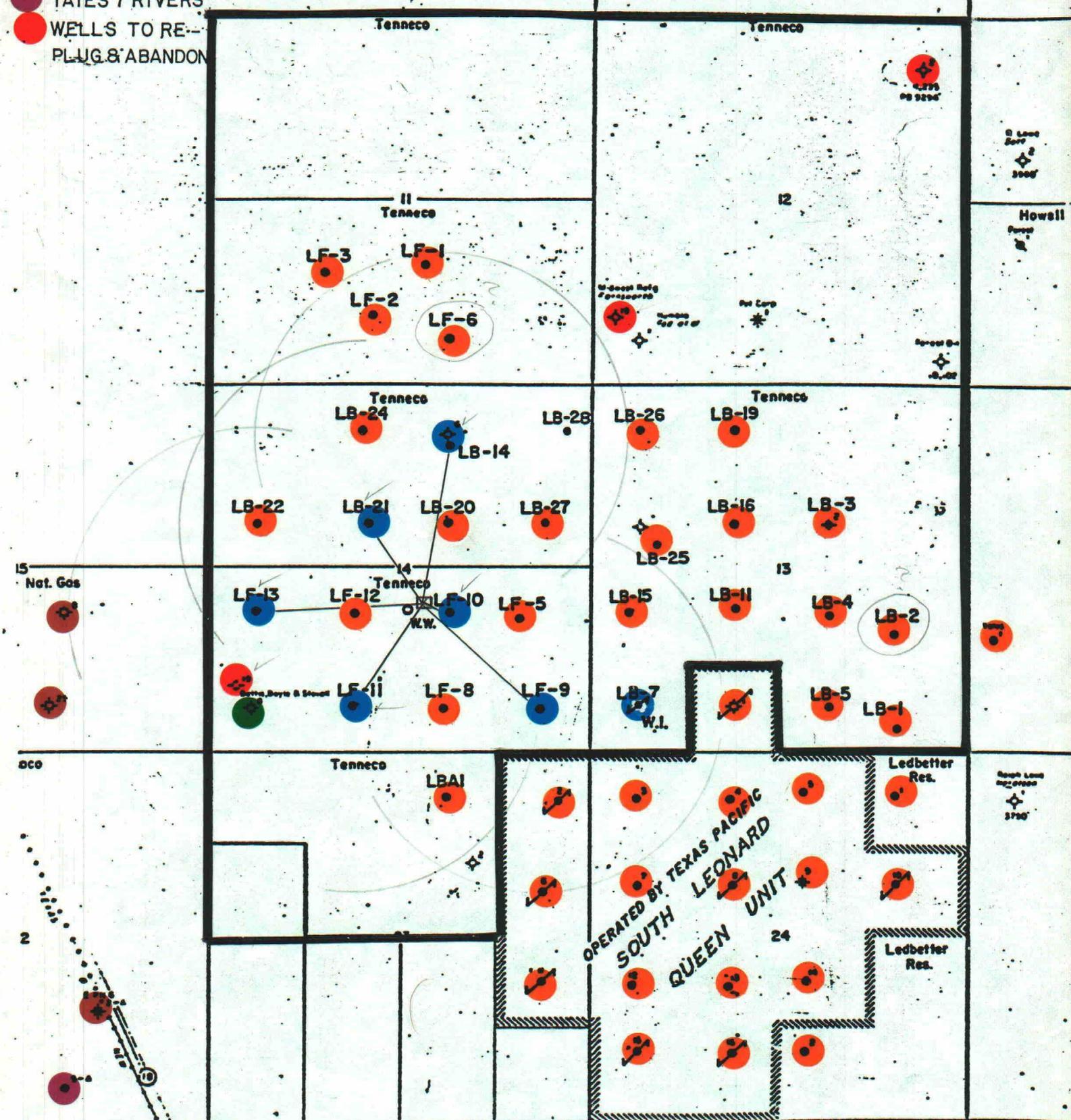


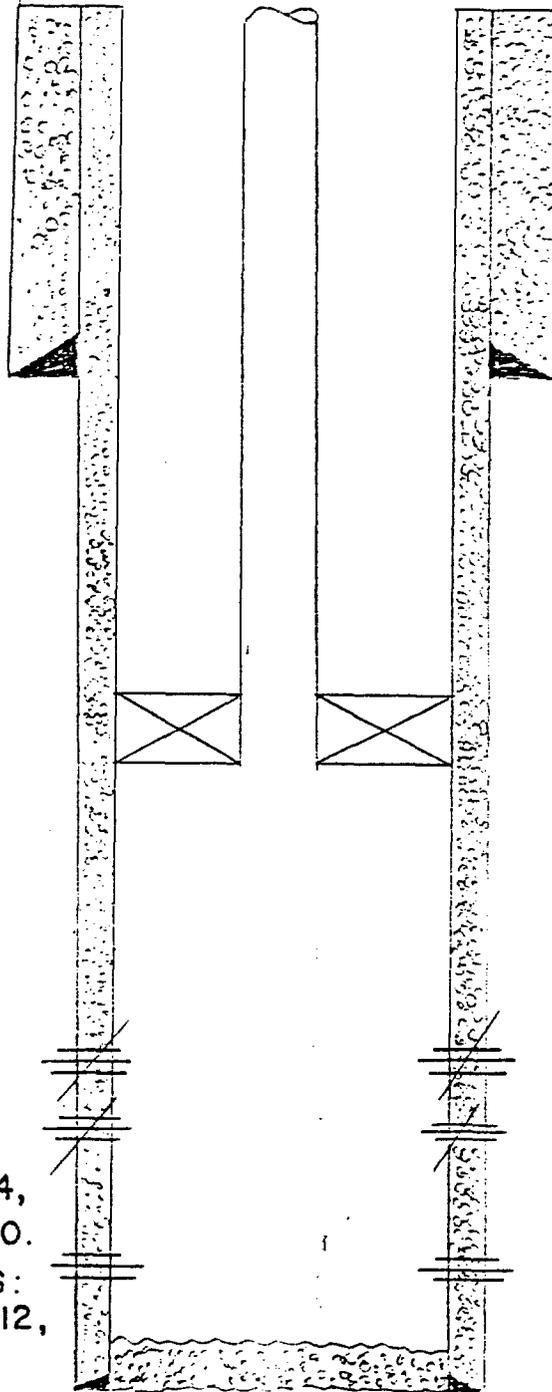
EXHIBIT II

SOUTH LEONARD AREA
LEA COUNTY, NEW MEXICO
PLAT OF OPERATORS AND
WELL COMPLETION ZONES

WELL SCHEMATIC

LEONARD FEDERAL No. 9

LOC. 660' FSL & 660' FEL, Sect. 14, T26S, R37E
KB 9.5' above GL (GL elev. - 3000')



PROPOSED PACKER
SETTING AT 3350'

8 5/8" 32 LB. CSA
505' CMT w/520 sx., circ.

QUEEN PERFS:
3380-82', 85-87, 90-94,
3402-04', 10-12, 22-40.
PROPOSED PENROSE PERFS:
3487, 3490, 3498, 3501, 3512,
3516, 3522, 3526, 3530.

5 1/2" 15.5 LB K-55 GSA
3551' CMT w/1100sx., circ.

PBD 3488'
TD 3555'

EXHIBIT VIII

WELL SCHEMATIC

LEONARD FEDERAL No.10

LOC. 1980' FSL & 1980' FEL, Sect. 14, T26S, R37E
ELEV. 2992' GL., KB 9.5' above G.L.

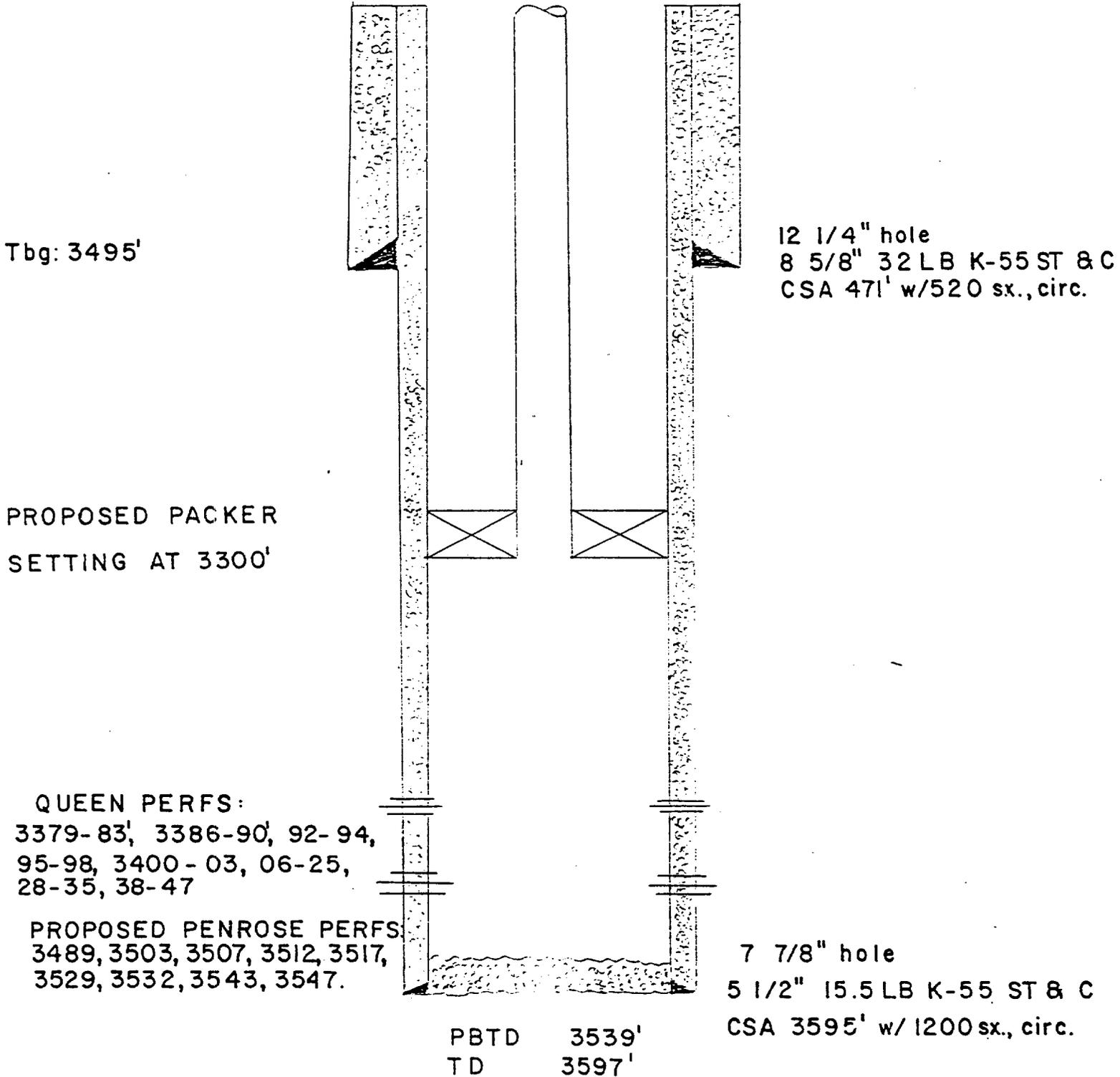


EXHIBIT IX

WELL SCHEMATIC

LEONARD FEDERAL No. II
LOC. 660' FSL & 1980' FWL, Sect. 14, T26S, R37E
ELEV. 2990' G.L.

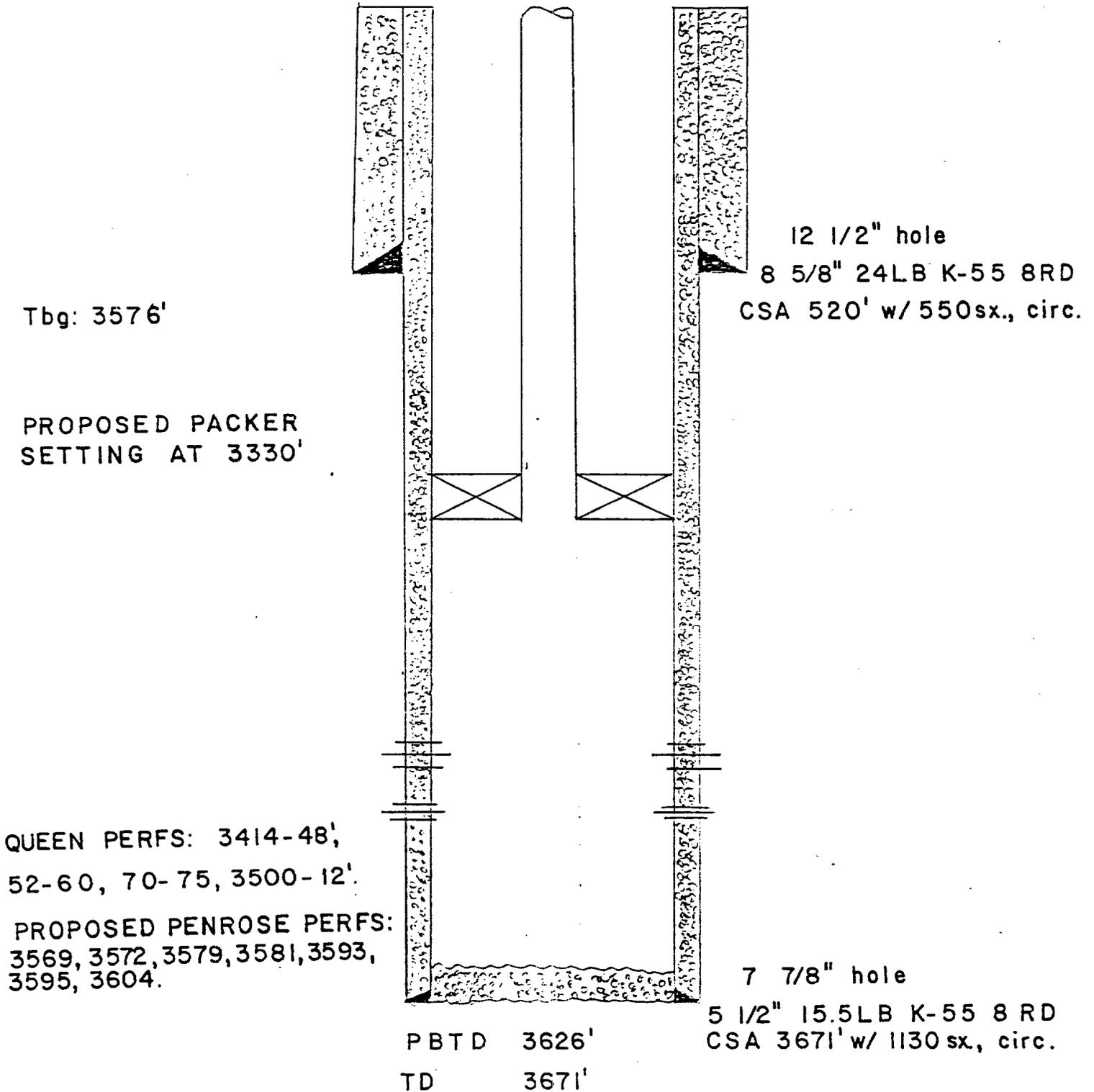


EXHIBIT X

WELL SCHEMATIC

LEONARD FEDERAL No. 13

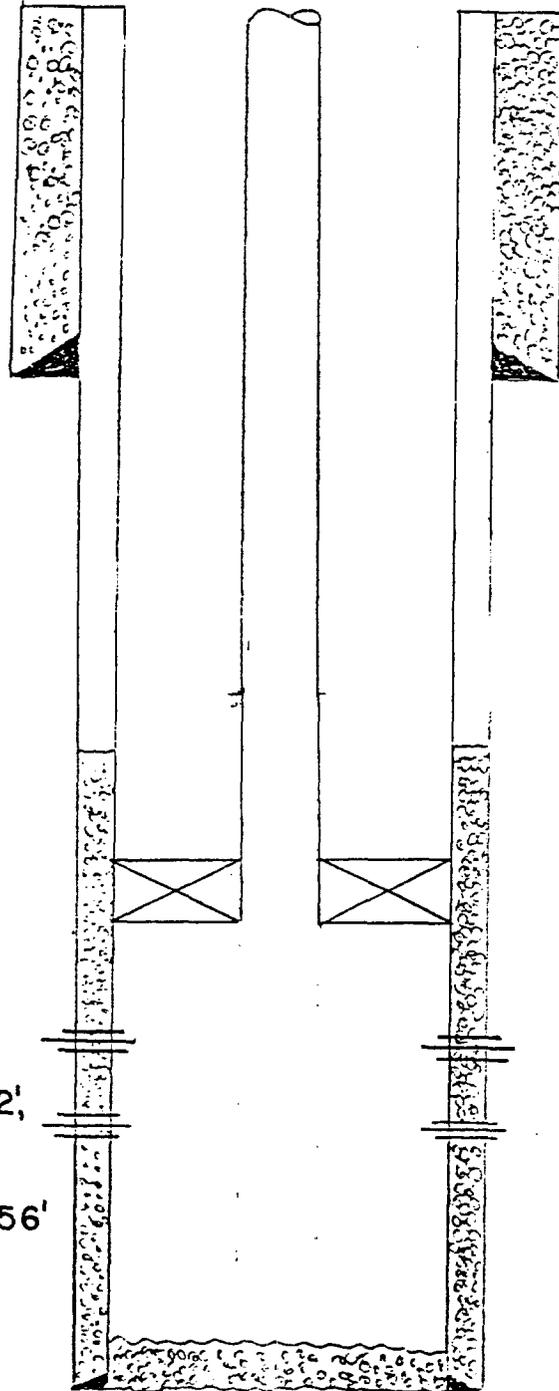
LOC. 1980' FSL & 660' FWL, Sect. 14, T26S, R37E
ELEV. 2992' G.L. & 3003' KB

Tbg: 3642'

PROPOSED PACKER
SETTING AT 3310'

QUEEN PERFS: 3405-42',
48-68, 80-96, 3502-28.

PENROSE PERFS: 3554-56'
64-86, 3600-10'.



12 1/4" hole
8 5/8" 24 LB K-55 ST & C
8 RT CSA 520' w/500sx., circ.

7 7/8" hole

PBD 3678'
TD 3702'

5 1/2" 15.5 LB K-55 8 RT CSA
3700' w/750 sx.

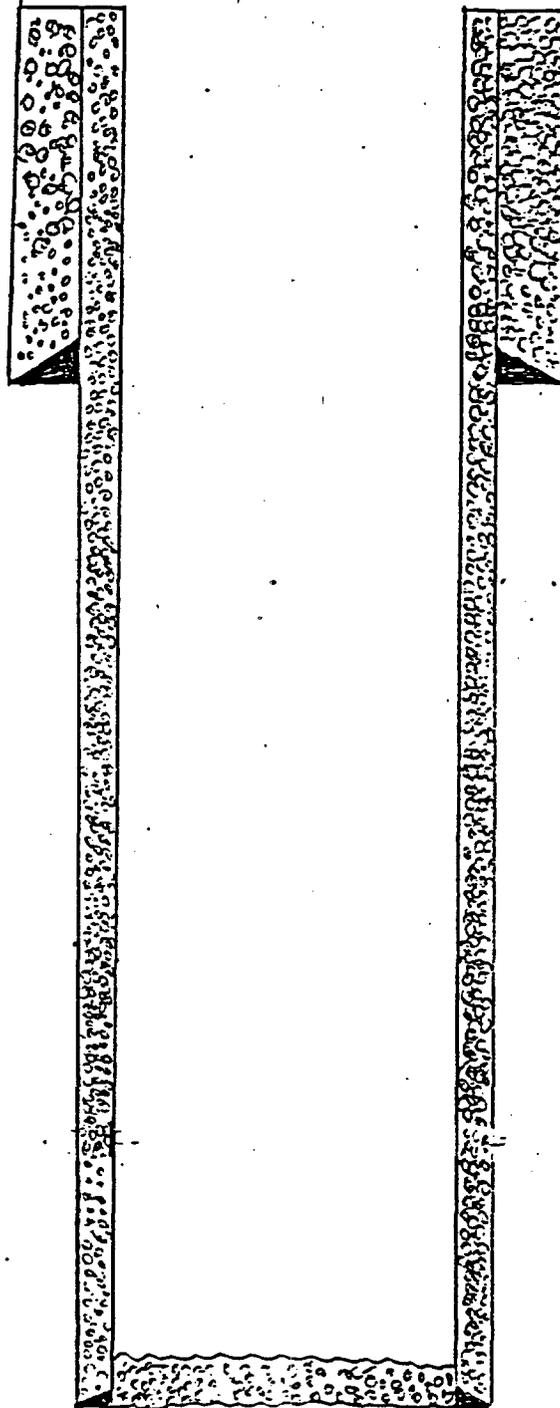
EXHIBIT XI

PROPOSED WELL SCHEMATIC

LEONARD BROTHERS 14-B

LOC. 657' FNL & 1983' FEL, Sect. 14, T26S, R37E

ELEV. 3003.4' GL



12 1/4" hole
8 5/8" 24 LB. CSA '265'
w/2 25 sx., circ.

5 1/2" 15.5 LB CSA 3600'

TD 3600

EXHIBIT V

WELL SCHEMATIC

LEONARD BROTHERS No. 21
LOC. 2180' FNL & 1980' FWL, Sect. 14, T26S, R37E
ELEV. 2997' GL & 3008' KB

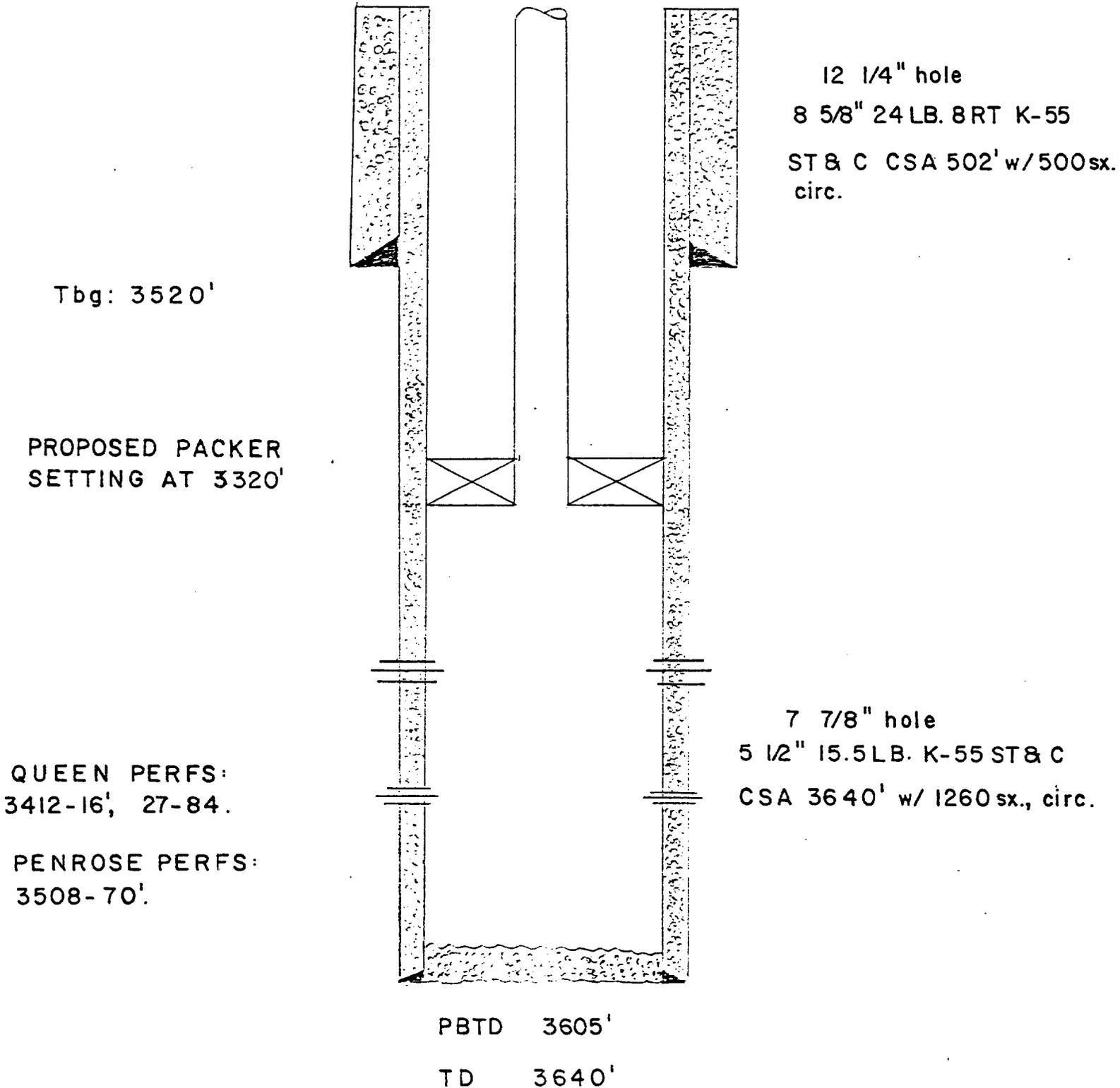


EXHIBIT XII

TENNECO OIL COMPANY SOUTH LEONARD AREA WELL SCHEMATICS

TENNECO OIL CO.
LEONARD BROTHERS 14-B
SEC. 14, T26S R37E

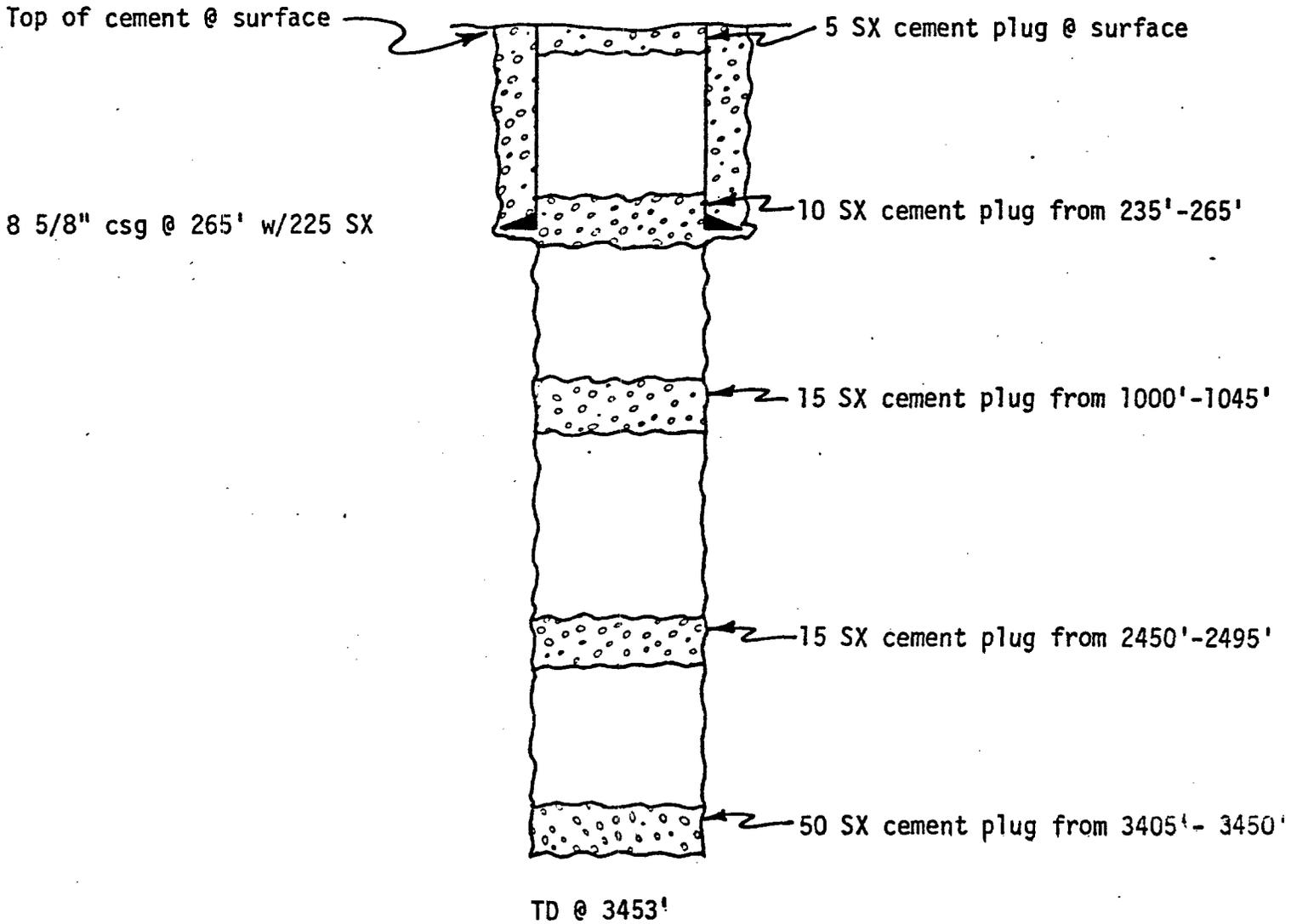


EXHIBIT IV

TENNECO OIL COMPANY

SOUTH LEONARD AREA

WELL SCHEMATICS

MIDWEST REFINING
 FARNSWORTH 19-M
 SEC. 14, T26S R37E

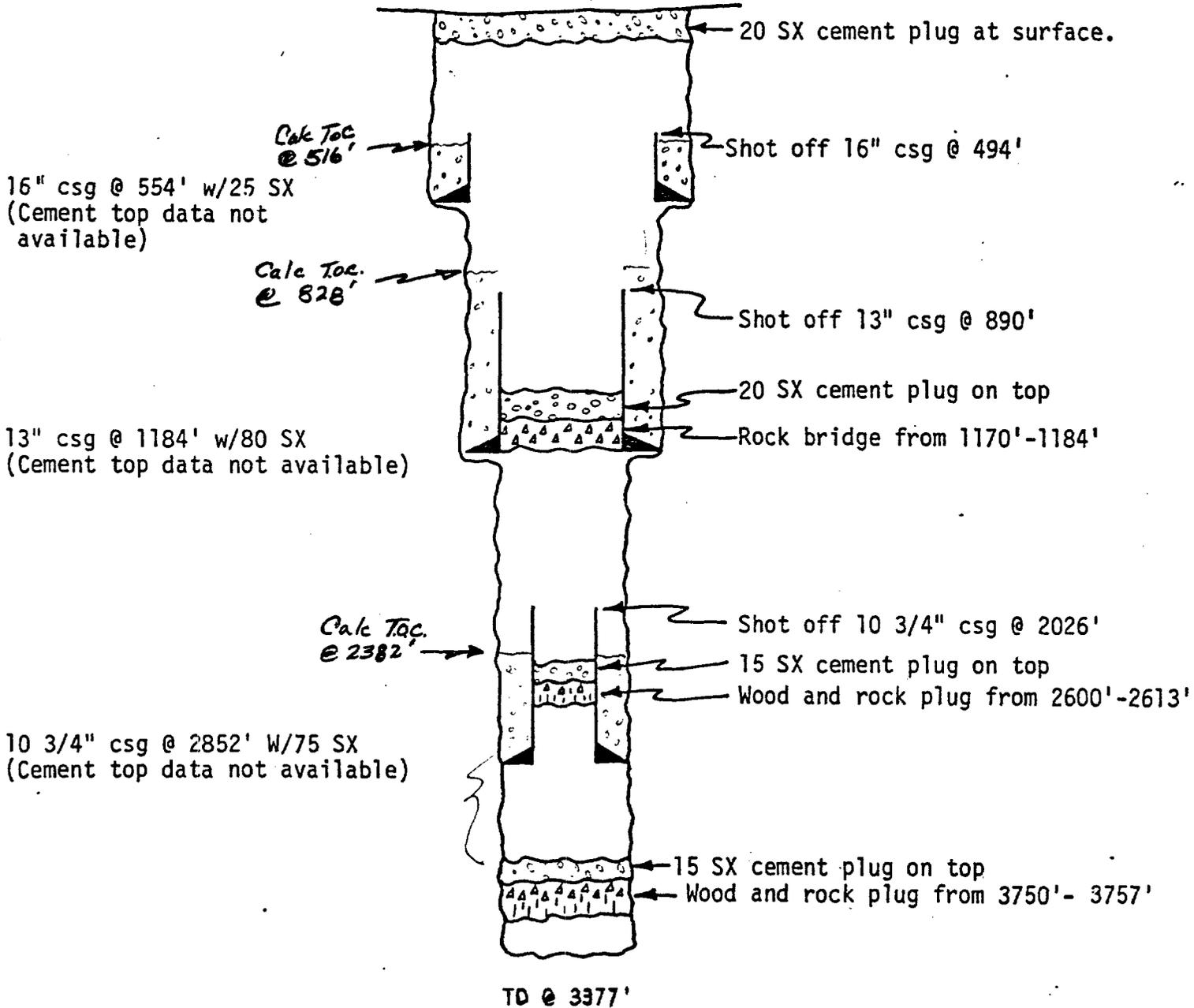


EXHIBIT VI

SOUTH LEONARD AREA

WELL SCHEMATICS

PROPOSED
MIDWEST REFINING
FARNSWORTH 19-M
SEC. 14, T26S R37E

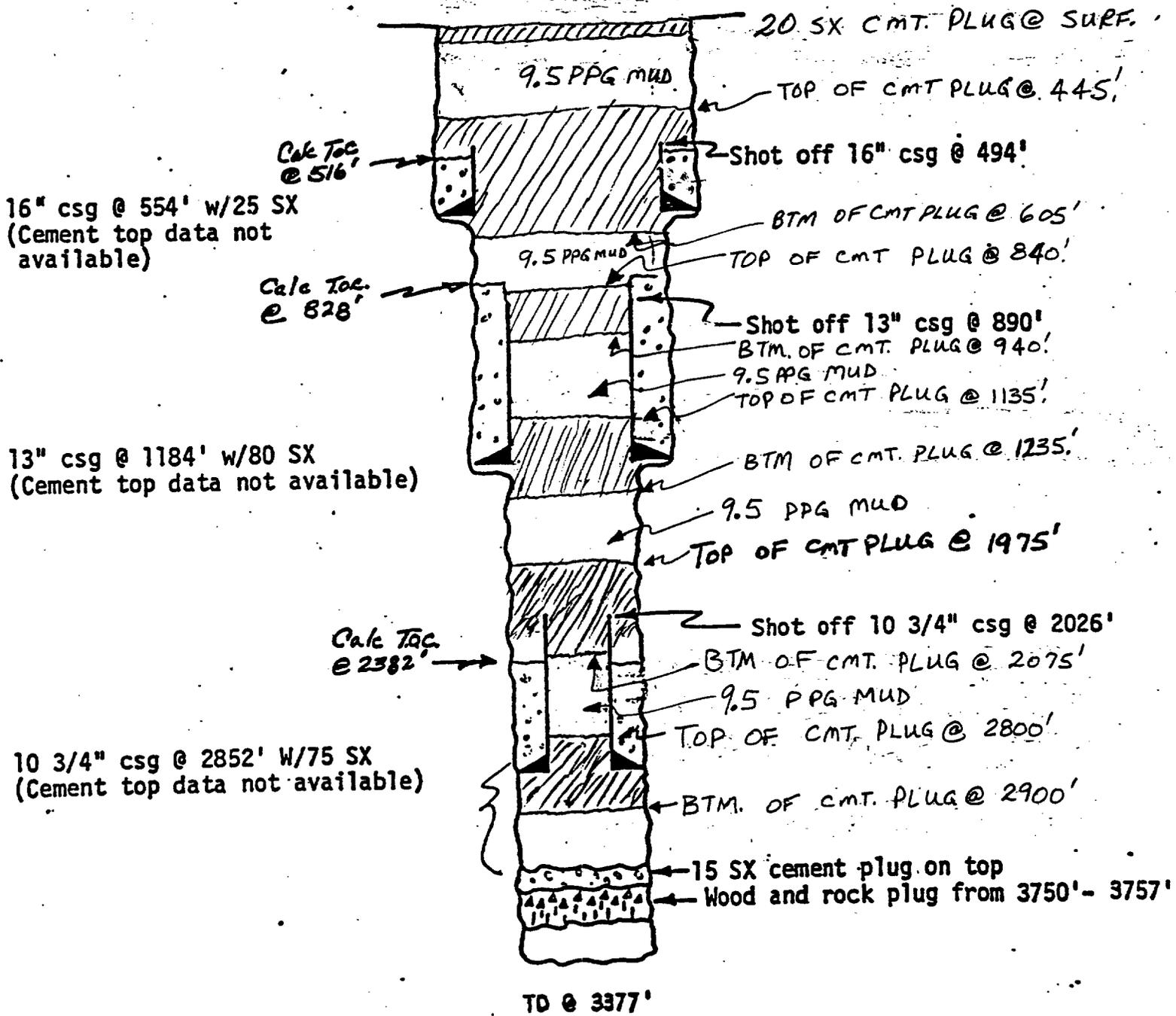


EXHIBIT VII

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9-331-C for such proposals.)

1. oil well gas well other (To be converted to WIW)

2. NAME OF OPERATOR
Tenneco Oil Company

3. ADDRESS OF OPERATOR
6800 Park Ten Blvd., Suite 200 North
San Antonio, Texas 78213

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: 660' FSL & 660' FEL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH:

5. LEASE
Leonard Federal

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME

9. WELL NO.
9

10. FIELD OR WILDCAT NAME
South Leonard Queen

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec 14, T26S, R37E

12. COUNTY OR PARISH
Lea County

13. STATE
New Mexico

14. API NO.

15. ELEVATIONS (SHOW DF, KDB, AND WD)
3000' G.L. & 3010' KB

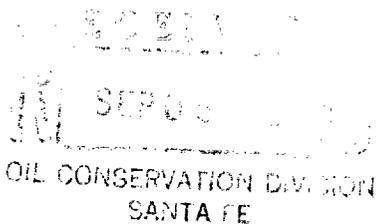
16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

REQUEST FOR APPROVAL TO:		SUBSEQUENT REPORT OF:
TEST WATER SHUT-OFF	<input type="checkbox"/>	<input type="checkbox"/>
FRACTURE TREAT	<input type="checkbox"/>	<input type="checkbox"/>
SHOOT OR ACIDIZE	<input type="checkbox"/>	<input type="checkbox"/>
REPAIR WELL	<input type="checkbox"/>	<input type="checkbox"/>
PULL OR ALTER CASING	<input type="checkbox"/>	<input type="checkbox"/>
MULTIPLE COMPLETE	<input type="checkbox"/>	<input type="checkbox"/>
CHANGE ZONES	<input type="checkbox"/>	<input type="checkbox"/>
ABANDON*	<input type="checkbox"/>	<input type="checkbox"/>
(other) SQ. Queen, Perf Penrose, Treat & Convert to WIW		

(NOTE: Report results of multiple completion or zone change on Form 9-330.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

This current Queen well has produced 100% water; therefore, we will squeeze the Queen perms and drill out the squeeze plus from 3488-3540. The Penrose will be perforated 3487-3530' and used for water injection to determine how well the Penrose formation will waterflood.



Subsurface Safety Valve: Manu. and Type _____ Set @ _____ Ft.

18. I hereby certify that the foregoing is true and correct
SIGNED Mark Jacoby TITLE Prod. Engineer DATE 6-15-79

(This space for Federal or State office use)
APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

EXHIBIT XIII

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9-331-C for such proposals.)

1. oil well gas well other (To be converted to WIW)

2. NAME OF OPERATOR
Tenneco Oil Company

3. ADDRESS OF OPERATOR
6800 Park Ten Blvd., Suite 200 North,
San Antonio, Texas 78213

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: 1980' FSL & 1980' FEL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH:

16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

REQUEST FOR APPROVAL TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF	<input type="checkbox"/>		<input type="checkbox"/>
FRACTURE TREAT	<input type="checkbox"/>		<input type="checkbox"/>
SHOOT OR ACIDIZE	<input type="checkbox"/>		<input type="checkbox"/>
REPAIR WELL	<input type="checkbox"/>		<input type="checkbox"/>
PULL OR ALTER CASING	<input type="checkbox"/>		<input type="checkbox"/>
MULTIPLE COMPLETE	<input type="checkbox"/>		<input type="checkbox"/>
CHANGE ZONES	<input type="checkbox"/>		<input type="checkbox"/>
ABANDON*	<input type="checkbox"/>		<input type="checkbox"/>
(other)	Perf Penrose, Treat, & Convert to WIW		

5. LEASE Leonard Federal	
6. IF INDIAN, ALLOTTEE OR TRIBE NAME	
7. UNIT AGREEMENT NAME	
8. FARM OR LEASE NAME	
9. WELL NO. 10	
10. FIELD OR WILDCAT NAME South Leonard Queen	
11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA Sec 14, T26S, R37E	
12. COUNTY OR PARISH Lea County	13. STATE New Mexico
14. API NO.	
15. ELEVATIONS (SHOW DF, KDB, AND WD) 2992' G.L. & 3002' K.B.	

(NOTE: Report results of multiple completion or zone change on Form 9-330.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

It will be necessary to drill out 3539-3560. The Penrose will be perforated 3489-3547, acid and fracture stimulated, and converted to water injection well.

OIL CONSERVATION DIVISION
SANTA FE

Subsurface Safety Valve: Manu. and Type _____ Set @ _____ Ft.

18. I hereby certify that the foregoing is true and correct
SIGNED Mark Jacoby TITLE Prod. Engineer DATE 6-15-79

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL IF ANY:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9-331-C for such proposals.)

1. oil well gas well other (to be converted to WIW)

2. NAME OF OPERATOR
Tenneco Oil Company

3. ADDRESS OF OPERATOR
6800 Park Ten Blvd., Suite 200 North

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
San Antonio, Texas, 78213

AT SURFACE: 660' FSL & 1980' FWL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH:

16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

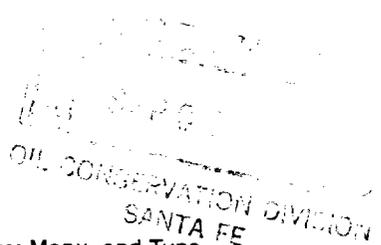
REQUEST FOR APPROVAL TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF	<input type="checkbox"/>		<input type="checkbox"/>
FRACTURE TREAT	<input type="checkbox"/>		<input type="checkbox"/>
SHOOT OR ACIDIZE	<input type="checkbox"/>		<input type="checkbox"/>
REPAIR WELL	<input type="checkbox"/>		<input type="checkbox"/>
PULL OR ALTER CASING	<input type="checkbox"/>		<input type="checkbox"/>
MULTIPLE COMPLETE	<input type="checkbox"/>		<input type="checkbox"/>
CHANGE ZONES	<input type="checkbox"/>		<input type="checkbox"/>
ABANDON*	<input type="checkbox"/>		<input type="checkbox"/>
(other) <u>Perf Penrose, Treat, & Convert to WIW</u>			

5. LEASE	<u>Leonard Federal</u>
6. IF INDIAN, ALLOTTEE OR TRIBE NAME	
7. UNIT AGREEMENT NAME	
8. FARM OR LEASE NAME	
9. WELL NO.	<u>11</u>
10. FIELD OR WILDCAT NAME	<u>South Leonard Queen</u>
11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA	<u>Sec 14, T26S, R37E</u>
12. COUNTY OR PARISH	<u>Lea County</u>
13. STATE	<u>New Mexico</u>
14. API NO.	
15. ELEVATIONS (SHOW DF, KDB, AND WD)	<u>2990' G.L.</u>

(NOTE: Report results of multiple completion or zone change on Form 9-330.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

The Penrose will be perforated 3569-3604, acid and frac stimulated, and converted to water injection.



Subsurface Safety Valve: Manu. and Type _____ Set @ _____ Ft.

18. I hereby certify that the foregoing is true and correct
SIGNED Mark Jacoby TITLE Prod. Engineer DATE 6-15-79

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

**UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY**

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9-331-C for such proposals.)

1. oil well gas well other (to be converted to WIW)

2. NAME OF OPERATOR
Tenneco Oil Company

3. ADDRESS OF OPERATOR
6800 Park Ten Blvd., Suite 200 North
San Antonio, Texas 78213

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: 1980' FSL & 660' FWL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH:

5. LEASE
Leonard Federal

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME

9. WELL NO.
13

10. FIELD OR WILDCAT NAME
South Leonard Queen

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec 14, T26S, R37E

12. COUNTY OR PARISH
Lea County

13. STATE
New Mexico

14. API NO.

15. ELEVATIONS (SHOW DF, KDB, AND WD)
2992' G.L. & 3003' K.B.

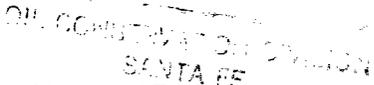
16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

REQUEST FOR APPROVAL TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF	<input type="checkbox"/>		<input type="checkbox"/>
FRACTURE TREAT	<input type="checkbox"/>		<input type="checkbox"/>
SHOOT OR ACIDIZE	<input type="checkbox"/>		<input type="checkbox"/>
REPAIR WELL	<input type="checkbox"/>		<input type="checkbox"/>
PULL OR ALTER CASING	<input type="checkbox"/>		<input type="checkbox"/>
MULTIPLE COMPLETE	<input type="checkbox"/>		<input type="checkbox"/>
CHANGE ZONES	<input type="checkbox"/>		<input type="checkbox"/>
ABANDON*	<input type="checkbox"/>		<input type="checkbox"/>
(other) Treat and convert to WIW	<input type="checkbox"/>		<input type="checkbox"/>

(NOTE: Report results of multiple completion or zone change on Form 9-330.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

The Queen and Penrose perforations will be acid washed and converted to water injection.



Subsurface Safety Valve: Manu. and Type _____ Set @ _____ Ft.

18. I hereby certify that the foregoing is true and correct
SIGNED Mark Jarolny TITLE Prod. Engineer DATE 6-15-79

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

5. LEASE Leonard Brothers	
6. IF INDIAN, ALLOTTEE OR TRIBE NAME	
7. UNIT AGREEMENT NAME	
8. FARM OR LEASE NAME	
9. WELL NO. 21	
10. FIELD OR WILDCAT NAME South Leonard Queen	
11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA Sec 14, T26S, R37E	
12. COUNTY OR PARISH Lea County	13. STATE New Mexico
14. API NO.	
15. ELEVATIONS (SHOW DF, KDB, AND WD) 2997' G.L. & 3008' K.B.	

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9-331-C for such proposals.)

1. oil well gas well other (to be converted to WIW)

2. NAME OF OPERATOR
Tenneco Oil Company

3. ADDRESS OF OPERATOR
6800 Park Ten Blvd., Suite 200 North
San Antonio, Texas 78213

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: 2180' FNL & 1980' FWL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH:

16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

REQUEST FOR APPROVAL TO:		SUBSEQUENT REPORT OF:
TEST WATER SHUT-OFF	<input type="checkbox"/>	<input type="checkbox"/>
FRACTURE TREAT	<input type="checkbox"/>	<input type="checkbox"/>
SHOOT OR ACIDIZE	<input type="checkbox"/>	<input type="checkbox"/>
REPAIR WELL	<input type="checkbox"/>	<input type="checkbox"/>
PULL OR ALTER CASING	<input type="checkbox"/>	<input type="checkbox"/>
MULTIPLE COMPLETE	<input type="checkbox"/>	<input type="checkbox"/>
CHANGE ZONES	<input type="checkbox"/>	<input type="checkbox"/>
ABANDON*	<input type="checkbox"/>	<input type="checkbox"/>
(other) Treat and convert to WIW		

(NOTE: Report results of multiple completion or zone change on Form 9-330.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

The perforations will be acid washed and then converted to water injection well.

Subsurface Safety Valve: Manu. and Type _____ Set @ _____ Ft.

18. I hereby certify that the foregoing is true and correct

SIGNED Mark Jacoby TITLE Prod. Engineer DATE 6-15-79

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

Tenneco Oil Exploration and Production

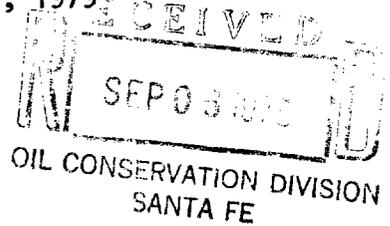
A Tenneco Company



Southwestern Division

6800 Park Ten Blvd. • Suite 200 North
San Antonio, Texas 78213
(512) 734-8161

August 29, 1979



United States Department of the Interior
Geological Survey
Conservation Division
414 W. Taylor
Hobbs, New Mexico 88240

Gentlemen:

Tenneco Oil Company requests renewal of the application to re-enter Leonard Brothers No. 14 which was previously approved June 28, 1977. A sundry notice requesting the renewal and the original application are attached. We respectfully request your approval of this application.

Thank you.

Sincerely yours,

A handwritten signature in cursive script that reads "Mark Jacoby".

Mark Jacoby
Senior Production Engineer

MJ/mb
Attachments

EXHIBIT III

**UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY**

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9-331-C for such proposals.)

1. oil well gas well other PXA

2. NAME OF OPERATOR
Tenneco Oil Exploration & Production

3. ADDRESS OF OPERATOR San Antonio, 6800 Park Ten Blvd., Suite 200 N, Texas 78213

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: 657' FNL & 1983' FEL, Unit B
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH:

16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

REQUEST FOR APPROVAL TO: SUBSEQUENT REPORT OF:

TEST WATER SHUT-OFF	<input type="checkbox"/>	<input type="checkbox"/>
FRACTURE TREAT	<input type="checkbox"/>	<input type="checkbox"/>
SHOOT OR ACIDIZE	<input type="checkbox"/>	<input type="checkbox"/>
REPAIR WELL	<input type="checkbox"/>	<input type="checkbox"/>
PULL OR ALTER CASING	<input type="checkbox"/>	<input type="checkbox"/>
MULTIPLE COMPLETE	<input type="checkbox"/>	<input type="checkbox"/>
CHANGE ZONES	<input type="checkbox"/>	<input type="checkbox"/>
ABANDON*	<input type="checkbox"/>	<input type="checkbox"/>

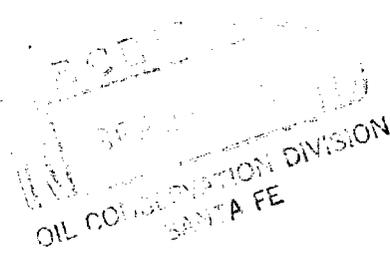
(other) Re-enter PXA & convert to WIW

5. LEASE <u>NM 7951</u>	
6. IF INDIAN, ALLOTTEE OR TRIBE NAME	
7. UNIT AGREEMENT NAME	
8. FARM OR LEASE NAME <u>Leonard Bros.</u>	
9. WELL NO. <u>14</u>	
10. FIELD OR WILDCAT NAME <u>South Leonard Queen</u>	
11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA <u>Sec. 14, T26S, R37E</u>	
12. COUNTY OR PARISH <u>Lea</u>	13. STATE <u>New Mexico</u>
14. API NO.	
15. ELEVATIONS (SHOW DF, KDB, AND WD) <u>3003.4' G.L.</u>	

(NOTE: Report results of multiple completion or zone change on Form 9-330.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

Re-enter PXA well and drill out cement plugs to 3600'. Casing will be set at 3600', perforated and stimulated in the Queen and Penrose, and converted to water injection.



Subsurface Safety Valve: Manu. and Type _____ Set @ _____ Ft.

18. I hereby certify that the foregoing is true and correct

SIGNED Mark Jacoby TITLE Sr. Production Eng. DATE August 29, 1979

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK
 DRILL ~~ROTARY~~ DEEPEN PLUG BACK
 b. TYPE OF WELL
 OIL WELL GAS WELL OTHER SINGLE ZONE MULTIPLE ZONE
 2. NAME OF OPERATOR
 TENNECO OIL COMPANY
 3. ADDRESS OF OPERATOR
 1860 Lincoln St., Suite 1200, Denver, Colorado 80295
 4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.)
 At surface 657' FNL and 1983' FEL
 At proposed prod. zone Unit B
 14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*
 See point 1: B7& C of Surface Use Plan

6. IF INDIAN, ALLOTTEE OR TRIBE NAME
 7. UNIT AGREEMENT NAME
 8. FARM OR LEASE NAME
 Leonard Bros.
 9. WELL NO
 14
 10. FIELD AND POOL OR WILDCAT
 Leonard Queen, South
 11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
 Sec. 14, T26S, R37E
 12. COUNTY OR PARISH 13. STATE
 Lea New Mexico

10. DISTANCE FROM PROPOSED LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any)
 16. NO. OF ACRES IN LEASE 2520
 17. NO. OF ACRES ASSIGNED TO THIS WELL 40
 18. DISTANCE FROM PROPOSED LOCATION TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT. 3600'
 19. PROPOSED DEPTH 3600'
 20. ROTARY OR CABLE TOOLS Rotary
 21. ELEVATIONS (Show whether DF, RT, GR, etc.)
 3003.4' GL OIL CONSERVATION ON UNIT SANTA FE
 22. APPROX. DATE WORK WILL START*

23. actual PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
hole 12-1/4"	8-5/8"	24#	265'	sacks circulated to surface
be run 7-7/8"	5-1/2"	15.5#	3600'	cement to surface in two stages

Was open hole before plugging from

History: This well was known before as the Leonard Federal #6 and was plugged and abandoned. The following plugs were set: 5 sacks at surface; 10 sacks from 235' - 265'; 15 sacks from 1000' - 1045'; 15 sacks from 2450' - 2495'; and 50 sacks from 3405' - 3450'.

- We propose to drill out the cement plugs to + 3600' and test this well as follows:
- The geologic name of this surface formation is the Ogallala Lime (Miocene).
 - Formation Tops (Estimated)

Salado	+1155'	Salt
Yates	+2524'	Possible Oil or Gas Producer
7 Rivers	+2850'	Possible Oil or Gas Producer
Queen	+3395'	Oil and Gas
Penrose	+3495'	Oil and Gas
 - If productive, 5 1/2" OD, 15.5 # K-55 new casing will be run and cemented to surface in two stages. Casinghead will be a weld on 8-5/8" head w/a 3000 psi rating.
 - Blowout preventors: Hydraulic, double ram, 10". One set of rams will be provided for each size drill pipe in the hole. One set of blind rams at all times. Fill line will be 2", kill line will be 2", choke relief line will be 2" with variable choke. BOP's will be installed, tested and in working order before drilling below second plug and shall be maintained ready for use until drilling operations are completed. BOP's, drills, and tests will be recorded in the drillers logs.
 - We will use; Drill bits, drill collars and drill pipe as needed to drill out plugs.
 - Auxiliary Equipment
 - Kelly cock will be in use at all times.
 - Stabbing valve to fit drill pipe will be present on floor at all times.
 - Mud monitoring will be visual.
 - Floats at bits.
 - Drill string safety valve (s) to fit all pipe in the drill string will be maintained on the rig floor while drilling operations are in progress.
 - This well will be pump tested after recovery of any load oil or water. CNL-FDC-GR caliper logs will be taken.
 - No abnormal pressures or temperatures are anticipated. See point #5 for blowout prevention equipment.
 - The drilling of these plugs will take approximately two days. The gas is not dedicated to any purchaser as of this date.
 - Your office (Telephone 505/393-3612) will be notified of spudding in sufficient time to witness cementing operations. Immediate notice will be given on blowouts, fires, spills, and accidents involving life-threatening injuries or loss of life. Prior approval will be obtained before appreciably changing drilling program or commencing plugging operation plug back work, casing repair work or corrective cementing operations.

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

24. SIGNED D. D. Meyers TITLE Div. Production Manager
 (This space for Federal or State office use)
 PERMIT NO. _____ APPROVAL DATE JUN 28 1977
 APPROVED BY _____ TITLE _____
 CONDITIONS OF APPROVAL, IF ANY: _____
 APPROVED AS AMENDED
 JUN 28 1977
 LEONARD MOSOL
 ACTING DISTRICT ENGINEER

HUBBS OFFICE COPY

Budget Bureau No. 42-R368.4
Approval expires 12-31-60.

(SUBMIT IN TRIPLICATE)

Land Office Las Cruces

Lease No. 062387

Unit 1

UNITED STATES DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY

RECEIVED

NOV 18 1959

APPROVED
MAY 18 1959
T. E. GODFREY
ACTING DISTRICT ENGINEER

SUNDRY NOTICES AND REPORTS ON WELLS

GEOLOGICAL SURVEY
HOBBS, NEW MEXICO

NOTICE OF INTENTION TO DRILL.....	SUBSEQUENT REPORT OF WATER SHUT-OFF.....	
NOTICE OF INTENTION TO CHANGE PLANS.....	SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING.....	
NOTICE OF INTENTION TO TEST WATER SHUT-OFF.....	SUBSEQUENT REPORT OF ALTERING CASING.....	
NOTICE OF INTENTION TO RE-DRILL OR REPAIR WELL.....	SUBSEQUENT REPORT OF RE-DRILLING OR REPAIR.....	
NOTICE OF INTENTION TO SHOOT OR ACIDIZE.....	SUBSEQUENT REPORT OF ABANDONMENT.....	<input checked="" type="checkbox"/>
NOTICE OF INTENTION TO PULL OR ALTER CASING.....	SUPPLEMENTARY WELL HISTORY.....	
NOTICE OF INTENTION TO ABANDON WELL.....		

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

Roowell, New Mexico
November 18, 1959

19

Well No. _____ is located _____ ft. from $\left\{ \begin{matrix} N \\ S \end{matrix} \right\}$ line and _____ ft. from $\left\{ \begin{matrix} E \\ W \end{matrix} \right\}$ line of sec. _____

_____ (1/4 Sec. and Sec. No.)
_____ (Twp.) _____ (Range) _____ (Meridian)
_____ (Field) _____ (County or Subdivision) _____ (State or Territory)

The elevation of the derrick floor above sea level is _____ ft.

DETAILS OF WORK

ILLEGIBLE

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudlogging points, and all other important proposed work)

T.D. 2450'

Plugs in accordance with NI.

2-15-59 Well P 2 A (50 sx cement 3,450-3,050', 15 sx cement 2450-2400'
15 sx cement 1875-1000; 10 sx cement 205-225; regulation marker
in top 5' of cement at top.

VERBAL PERMISSION AND METHOD OF PLUGGING SECURED FROM
MR. VERNON AT HOBBS.

NOTE: As soon as plug is removed, location will be leveled and will notify
when ready for inspection.

9-24-59 J.E.C.K. Marker reads T.255. J.E.S.
3-17-59 J.E.C.K. OK J.E.S.
I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

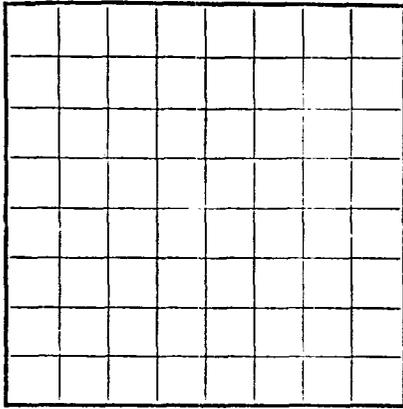
Company Marathon Oil Company

Address Box 702 - Roowell, New Mexico

By Timothy T. Leonard

Title Timothy T. Leonard

RECEIVED
SFPO 3-10-59
OIL CONSERVATION DIVISION
SANTA FE



LOCATE WELL CORRECTLY

U. S. LAND OFFICE Las Cruces SERIAL NUMBER 062384 LEASE OR PERMIT TO PROSPECT B

UNITED STATES DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY

LOG OF OIL OR GAS WELL

Company LEONARD OIL COMPANY Address P.O. Box 708 - Roswell, New Mexico Lessor or Tract Leonard-Federal Field Leonard State New Mexico Well No. 6 Sec. 14 T. 2S. R. 37E Meridian N.M.P.M. County Lea Location 660 ft. S. of N. Line and 1930 ft. E. of E. Line of Sec. 6 Elevation 3000' (Derrick floor relative to sea level)

The information given herewith is a complete and correct record of the well and all work done thereon so far as can be determined from all available records. Signed Timothy T. Leonard

Date November 24, 1958 Title Timothy T. Leonard, Sec'y-Treas.

The summary on this page is for the condition of the well at above date.

Commenced drilling 11-4, 1958 Finished drilling 11-15, 1958

OIL OR GAS SANDS OR ZONES (Denote gas by G)

No. 1, from NONE to No. 4, from No. 2, from No. 5, from No. 3, from No. 6, from

IMPORTANT WATER SANDS

No. 1, from 210 to 230 No. 3, from No. 2, from No. 4, from

CASING RECORD

Table with columns: Size casing, Weight per foot, Threads per inch, Make, Amount, Kind of shoe, Cut and pulled from, Perforated (From-To), Purpose. Row 1: 8 5/8, 24#, 265', Surface.

MUDDING AND CEMENTING RECORD

Table with columns: Size casing, Where set, Number sacks of cement, Method used, Mud gravity, Amount of mud used. Row 1: 8 5/8, 265', 225 ex, Halliburton.

PLUGS AND ADAPTERS

Heaving plug—Material Length Depth set Adapters—Material Size

SHOOTING RECORD

Table with columns: Size, Shell used, Explosive used, Quantity, Date, Depth shot, Depth cleaned out.

TOOLS USED

Rotary tools were used from 0 feet to 3453 feet, and from Cable tools were used from feet to feet, and from feet to feet

DATES

Put to producing 19

The production for the first 24 hours was NONE barrels of fluid of which % was oil; % emulsion; % water; and % sediment. Gravity, °Bé.

If gas well, cu. ft. per 24 hours Gallons gasoline per 1,000 cu. ft. of gas

FOLD MARK

EMPLOYEES

J.R. Rodrick, Driller

G.B. Briggs, Driller

G.M. Brice, Driller

, Driller

FORMATION RECORD

FROM-	TO-	TOTAL FEET	FORMATION		
0	160	160	Sand & caleche	TOPS:	
160	265	105	Red Bed	T/Russler	952'
265	370	105	Anhy	T/ Salt	1110'
370	707	337	Anhy	Base/Salt	2450'
707	890	183	Red bed & anhy	T/Yates	2600'
890	1065	175	Anhy	T/Queen	3390'
1065	1296	231	Anhy		
1296	1645	349	Anhy		
1645	1955	310	Anhy		
1955	2190	235	Anhy		
2190	2435	245	Anhy		
2435	2543	108	Anhy		
2543	2606	63	Anhy		
2606	2726	120	Anhy & gyp		
2726	2890	164	Anhy & gyp		
2890	3075	185	Anhy & Lime		
3075	3136	61	Sandy lime & anhy		
3136	3274	138	Anhy & lime		
3274	3365	91	Lime & anhy		
3365	3392	27	Lime		
3392	3434	42	Lime		
3434	3453	19	TD		

[OVER]