

ORDER 4926: Appl. of SHERANDOAH
OIL CORP. FOR A WATERFLOOD
PROJECT, REDDY COUNTY, N. M.

CASE No.

4926

Application,

Transcripts,

Small Exhibits

ETC.

dearnley, meier & mc cormick

209 SIMMS BLDG. • P.O. BOX 1092 • PHONE 243-6891 • ALBUQUERQUE, NEW MEXICO 87103
1216 FIRST NATIONAL BANK BLDG. EAST • ALBUQUERQUE, NEW MEXICO 87106

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
OIL CONSERVATION COMMISSION CONFERENCE ROOM
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO
March 28, 1973

EXAMINER HEARING

IN THE MATTER OF:

Application of Shenandoah Oil
Corporation for a unit agreement
and for a waterflood project,
Eddy County, New Mexico.

Case No. 4925 and 4926

BEFORE: Daniel S. Nutter
Examiner

TRANSCRIPT OF HEARING

1 MR. NUTTER: We will now call Cases 4925 and 4926.
2 Case 4925: Application of Shenandoah Oil Corporation for a
3 unit agreement, Eddy County, New Mexico. Case 4926: Application
4 of Shenandoah Oil Corporation for a waterflood project, Eddy
5 County, New Mexico.

6 Cases 4925 and 4926 will be consolidated for the
7 purpose of hearing.

8 MR. JENNINGS: James T. Jennings appearing on behalf
9 of Shenandoah. We have one witness. Does the Examiner have
10 any preference as to how we proceed?

11 MR. NUTTER: Probably take the unit agreement first
12 so we can get acquainted with the land.

13 NEIL F. TOLER
14 was called as a witness and, after being duly sworn according
15 to law, testified as follows:

16 DIRECT EXAMINATION

17 BY MR. JENNINGS:

18 Q Would you state your name, place of residence, and occupa-
19 tion, sir.

20 A My name is Neil Toler and I am employed by Shenandoah Oil
21 Corporation.

22 Q Mr. Toler, have you appeared before and testified before
23 the Commission or one of its examiners in the past?

24 A Yes, I have.

25 MR. JENNINGS: Are Mr. Toler's qualifications

1 acceptable?

2 MR. NUTTER: By whom are you employed?

3 THE WITNESS: Shenandoah Oil Corporation.

4 MR. NUTTER: Yes, they are.

5 Q (By Mr. Jennings) Are you familiar with the application
6 filed by Shenandoah seeking approving of the Robinson-
7 Jackson Unit Area Agreement?

8 A Yes, sir.

9 Q I believe, Mr. Toler, this was the unit agreement originally
10 put together by Atlantic-Richfield.

11 A Yes, sir.

12 Q And after being put together and preliminary negotiations
13 worked out, your company acquired the acreage from Atlantic-
14 Richfield.

15 A That's correct.

16 Q And I believe the agreement covers 1160 acres of Federal
17 land.

18 A Correct.

19 Q That is all in Eddy County and all in Township 17 South,
20 Range 29 East.

21 A Right.

22 Q Is Shenandoah Oil Corporation the unit operator?

23 A Shenandoah will be the operator.

24 Q What percentage of working interests does it own?

25 A 100%.

1 Q What is the unitized substance as defined by the unit
2 agreement?

3 A The Grayburg-San Andres formation.

4 Q Is that specifically defined in the unit agreement?

5 A Yes, sir. The Robinson B Well which is the offset well
6 of the No. 8 well in Section 27 is 1830 feet from the
7 south and 1730 feet from the west lines of Section 27.

8 Q Have you submitted this for tentative approval of the
9 USGS?

10 A Yes, sir. I have a letter dated March 15th, 1973.

11 Q Mr. Toler, who is the record title holder of all this
12 acreage?

13 A Atlantic-Richfield is the lessee of record.

14 Q And they have joined in the unit agreement?

15 A Yes, they have signed it.

16 Q Do you think the proposed unit agreement will prevent
17 waste and protect the correlative rights of all interests
18 in the area?

19 A I am a firm believer in that.

20 Q Have you obtained the approval of all royalty owners,
21 overriding royalty owners?

22 A Yes, we have obtained approval of the USGS. It is all
23 Federal land and we have obtained USGS approval. There
24 are overriding royalties in Tracts 1 and 1A and we
25 previously obtained approximately 77% of the overriding

1 interest owners besides the USGS.

2 Q What percentage of the owners have you obtained approval
3 from?

4 A Approximately 77.19% of the overriding royalty interest
5 owners.

6 MR. JENNINGS: At this time we will offer the unit
7 agreement which has been executed by all parties concerned and
8 I will just proceed with the other case.

9 MR. NUTTER: Go right ahead with your waterflood
10 project now.

11 (Whereupon Applicant's Exhibit 1 in Case 4925 was
12 admitted in evidence)

13 Q (By Mr. Jennings) Mr. Toler, are you also familiar with
14 the Shenandoah application for a waterflood project in
15 Eddy County, New Mexico?

16 A I am.

17 Q Briefly what does Shenandoah propose in connection with this
18 application?

19 A A desire to initiate a waterflood project to inject fresh
20 water into the Grayburg-San Andres formation through 16
21 existing wells as described in the application in Section
22 27, 34, and 35, Township 17 South, Range 29 East.

23 Q Are these wells all described in the application?

24 A Yes, sir.

25 Q With the locations set forth therein?

1 A Right, sir.

2 Q. And will you state what you propose to inject into those
3 wells.

4 A We propose to inject fresh water into the wells at a rate
5 of approximately 900 barrels a day in three separate zones
6 which are described later on in the application.

7 Q Please refer to what has been marked as Exhibit A and
8 explain just what that is and what it shows.

9 A Exhibit A is a plat showing the locations of our project.
10 In this particular plat, we have the unit outlined, the
11 project area. You will notice that two wells outside of
12 the unit area are included in the project area. This is
13 comprised of 16 injection wells and approximately 22 pro-
14 ducing wells at the present time that will probably be put
15 on production and injection in the San Andres and Grayburg
16 formations.

17 Q Mr. Toler, this area is in the unit agreement we have just
18 been discussing along with some adjacent land, is that true?

19 A It is shown more clearly in Exhibit B. The adjacent lands
20 are located to the east in Section 26 as shown by the
21 exhibit.

22 Q Referring again to Exhibit A, Mr. Toler, on that you have
23 outlined all of your present injection wells with solid
24 triangles.

25 A. That's correct.

1 Q And the injection wells you propose are outlined in
2 dashed triangles.

3 A That's correct.

4 Q Do you propose to flood these 16 wells simultaneously?

5 A Yes, we propose to put all of those wells on initially.

6 Q What is the general nature of production in the area at
7 this time?

8 A At the present time it is in the range of 80 to 90 barrels
9 a day from a total of 22 producing wells.

10 Q Do you feel that waterflooding these formations, the
11 Grayburg and San Andres, is feasible?

12 A Yes, I do.

13 Q And will it result in ultimate increased recovery.

14 A Yes.

15 Q And I believe you have stated that you're virtually sur-
16 rounded by currently operating waterflood projects.

17 A That's correct.

18 Q Are these offsetting projects successful?

19 A They are successful in several different categories.
20 They are partially unsuccessful because of loss of control
21 and injection. I think we will probably control our in-
22 jection more specifically with bottom hole flow regulators.

23 Q Do you contemplate, assuming the flood is successful,
24 converting additional wells to water injection?

25 A We have an 80 acre five-spot pattern and it's possible

1 that at some future date we might want to convert additional
2 wells to injection in order to form a 40 acre five-spot
3 flood plan.

4 Q And you are requesting the Commission to grant administra-
5 tive approval for such an application?

6 A Yes.

7 Q Now, where do you propose to obtain your water from,
8 Mr. Toler?

9 A There is a commercial water company in the area to the
10 east and we will probably be getting it from one of the
11 commercial water companies.

12 Q Will you inject the produced water when it is available?

13 A Yes, when water breakthrough occurs in conjunction with
14 fresh water.

15 Q What are the exact zones that you propose to flood?

16 A The Grayburg formation to a depth of 2359 feet and into
17 the Jackson zone of the San Andres formation to a depth
18 of approximately 2774 feet.

19 Q How much water do you propose to inject per day?

20 A A total of 900 barrels a day. There are two zones within
21 the Grayburg formation and we will inject 300 barrels a
22 day per zone and 300 barrels into the Jackson zone of the
23 San Andres, making a total of 900 barrels of water per
24 day per well.

25 Q Mr. Toler, referring now to what has been designated as

1 Exhibit C and which consists of 16 separate parts, would
2 you state what this is and describe the exhibit?

3 A Exhibit C are diagrammatic sketches of the injection wells
4 which we propose to convert to injection wells. Each
5 sketch contains the same information as to casing and
6 cementing and the perforated intervals.

7 Q You have this information on each, the same information
8 on each of the wells reflected in the exhibit?

9 A Yes, it is essentially the same information on each dia-
10 gramatic sketch.

11 Q Mr. Toler, referring now to what has been marked as
12 Exhibit D, would you tell us just what that exhibit shows.

13 A Exhibit D is a diagram showing the typical down hole
14 equipment to be installed in each injection well.

15 Q Do you have logs of the wells, Mr. Toler?

16 A I have the available logs given to us by Atlantic-Richfield
17 which consist of ten at the present time, ten of the
18 16 wells listed in the application.

19 Q Mr. Toler, have you requested the approval of the USGS for
20 the waterflood project?

21 A We have.

22 Q I hand you a letter dated March 15th, 1973, from the USGS
23 and ask you if that is the letter you received from them
24 approving the project.

25 A This is a copy of the letter we received from the USGS

1 outlining their approval and recommendations for further
2 requirements in regard to plats showing treating plat
3 locations.

4 Q Are you prepared to comply with all of the regulations
5 and requirements made by the USGS?

6 A Yes, I am.

7 Q Do you have anything further you wish to add in connection
8 with this application?

9 A Not at this time.

10 MR. JENNINGS: We have nothing further to offer, but
11 we do offer Exhibits A through E and we would also like to
12 offer the logs as exhibits if you would like them.

13 MR. NUTTER: Would you offer them as a package under
14 Exhibit F?

15 MR. JENNINGS: As a package, yes.

16 MR. NUTTER: Without objection Applicant's Exhibits
17 A through F will be admitted in evidence.

18 (Whereupon Applicant's Exhibits A through F were
19 admitted in evidence)

20 CROSS EXAMINATION

21 BY MR. NUTTER:

22 Q Do you anticipate that each of the injection wells will
23 have three injection zones?

24 A I anticipate every injection well will --- we have yet
25 alot of work to do in this area and I must point out

1 that the Jackson zone is the predominant producing zone in
2 the area. The metex tends to thin out in Section 27 and
3 it might be possible that we might not have metex in one
4 or two of the injection wells. However, I feel that
5 Loco Hills is productive in the area and we may have Loco
6 Hills and Jackson in all the wells.

7 Q Whether or not you had all three zones, you would still
8 have this uppermost packer shown on Exhibit B?

9 A Yes, sir.

10 Q So in all cases, your annularus will be added above a packer
11 and have a gauge at the surface.

12 A Yes.

13 Q And you anticipate that this 300 barrels would be the rate
14 of injection into each of the zones per day.

15 A Yes. We are limiting it to that right now because if you
16 take the total number of wells times 900 barrels, it's
17 approximately 14,400 barrels a day. At some later date,
18 we may be able to increase that.

19 MR. NUTTER: Are there any further questions of Mr.
20 Toler?

21 (No response)

22 MR. NUTTER: He may be excused.

23 (Witness excused)

24 MR. NUTTER: Do you have anything further, Mr.
25 Jennings?

1 MR. JENNINGS: I would offer one observation even
2 though I'm sure it's not required. We have to have this
3 approved by July 1st.

4 MR. NUTTER: If there is nothing further, we will
5 take Cases 4925 and 4926 under advisement.

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

3 I, RICHARD E. McCORMICK, a Certified Shorthand Reporter,
 4 do hereby certify that the foregoing and attached Transcript of
 5 Hearing before the New Mexico Oil Conservation Commission was
 6 reported by me; and that the same is a true and correct record
 7 of the said proceedings, to the best of my knowledge, skill and
 8 ability.

Richard E. McCormick
 Certified Shorthand Reporter

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I do hereby certify that the foregoing is
 a complete and true copy of the proceedings in
 the Examiner hearing of Case No. 4925-4926
 heard by me on 2/28, 1973.

[Signature], Examiner
 New Mexico Oil Conservation Commission

I N D E X

2 WITNESSPage

3 NEIL F. TOLER

4 Direct Examination by Mr. Jennings

3

5 Cross Examination by Mr. Nutter

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7 EXHIBITSOfferedAdmitted

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Exhibit 1 in Case 4925

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Exhibit A in Case 4926

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Exhibit C in Case 4926

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Exhibit D in Case 4926

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Exhibit E in Case 4926

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Exhibit F in Case 4926

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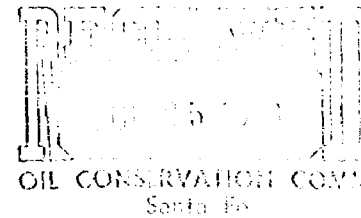


SHENANDOAH OIL CORPORATION

July 24, 1973

Oil Conservation Commission
P. O. Box 2083
Santa Fe, New Mexico 87501

Attn: Mr. A. L. Porter



B. J. KELLENBERGER
PRESIDENT
1500 COMMERCE BUILDING
FORT WORTH, TEXAS 76102
817/332-7381
TWX 910 890 5023

Re: Commission Order #R-4502
Shenandoah Robinson-Jackson Unit,
Grayburg-Jackson Field
Eddy County, New Mexico

Dear Mr. Porter:

In compliance with Rule 703(a) of the New Mexico Rules and Regulation Book, this is to advise you that water injection was commenced July 24, 1973 into the below listed wells as set forth in Case No. 4926. All of the following wells are located in Township 17 South, Range 29 East, NMPM, Eddy County, New Mexico (see attached plat):

<u>WELL NAME</u>	<u>TRACT</u>	<u>UNIT</u>	<u>SECTION</u>
F. M. Robinson "A" Well No. 4	1	G	34
F. M. Robinson "A" Well No. 7	1	I	27
F. M. Robinson "A" Well No. 9	1	O	27
F. M. Robinson "A" Well No. 11	1A	E	35
F. M. Robinson "A" Well No. 12	1A	A	34
F. M. Robinson "B" Well No. 15	2	G	27
F. M. Robinson "B" Well No. 16	2	I	35
F. M. Robinson "B" Well No. 17	2	K	35
F. M. Robinson "B" Well No. 4	2A	A	35
F. M. Robinson "B" Well No. 6	2A	G	35
F. M. Robinson "B" Well No. 8	2A	K	27
F. M. Robinson "B" Well No. 11	2A	C	35
F. M. Robinson "B" Well No. 19	3	I	34

Completion reports on the preceding wells will follow.

Very truly yours,

SHENANDOAH OIL CORPORATION



T. P. Bates
Vice President

TPB/cf

Attachment

cc: New Mexico Oil Conservation Commission

P. O. Drawer DD
Artesia, New Mexico 88210

U. S. Department of Interior
Geological Survey
P. O. Drawer U
Artesia, New Mexico 88210

Jennings & Copple
P. O. Box 1180
Roswell, New Mexico 88201

Mr. C. W. Downey
P. O. Box 2189
Hobbs, New Mexico 88240



OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
P. O. BOX 2088 - SANTA FE
87501

April 10, 1973

GOVERNOR
BRUCE KING
CHAIRMAN

LAND COMMISSIONER
ALEX J. ARMIJO
MEMBER

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

Mr. James T. Jennings
Jennings, Christy & Copple
Attorneys at Law
Post Office Box 1180
Roswell, New Mexico 88201

Re: Case No. 4925, 4926
Order No. R-4501 & R-4502
Applicant:

Shenandoah Oil Corporation

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.
A. L. PORTER, Jr.
Secretary-Director

ALP/ir

Copy of order also sent to:

Hobbs OCC X
Artesia OCC X
Aztec OCC

OTHER R-4501 - Unit Division, State Land Office
R-4502 - State Engineer Office

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. 4926
Order No. R-4502

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

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on March 28, 1973, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 10th day of April, 1973, 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, Shenandoah Oil Corporation, seeks authority to institute a waterflood project in the Robinson-Jackson Unit Area, Grayburg-Jackson Pool, by the injection of water into the Grayburg and the San Andres formations through 16 injection wells in Sections 27, 34 and 35, Township 17 South, Range 29 East, NMPM, Eddy County, New Mexico.

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

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

(5) That the subject application should be approved and the project should be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

IT IS THEREFORE ORDERED:

(1) That the applicant, Shenandoah Oil Corporation, is hereby authorized to institute a waterflood project in the

-2-

Case No. 4926
Order No. R-4502

Robinson-Jackson Unit Area, Grayburg-Jackson Pool, by the injection of water into the Grayburg and the San Andres formations through the following-described wells in Township 17 South, Range 29 East, NMPM, Eddy County, New Mexico:

<u>WELL NAME</u>	<u>UNIT</u>	<u>SECTION</u>
F. M. Robinson "A" Well No. 4	G	34
F. M. Robinson "A" Well No. 7	I	27
F. M. Robinson "A" Well No. 9	O	27
F. M. Robinson "A" Well No. 11	E	35
F. M. Robinson "A" Well No. 12	A	34
F. M. Robinson "B" Well No. 1	A	27
F. M. Robinson "B" Well No. 4	A	35
F. M. Robinson "B" Well No. 6	G	35
F. M. Robinson "B" Well No. 8	K	27
F. M. Robinson "B" Well No. 11	C	35
F. M. Robinson "B" Well No. 15	G	27
F. M. Robinson "B" Well No. 16	I	35
F. M. Robinson "B" Well No. 17	K	35
F. M. Robinson "B" Well No. 18	O	35
F. M. Robinson "B" Well No. 19	I	34
F. M. Robinson "B" Well No. 20	C	34

(2) That injection into each well shall be through plastic coated tubing set in a packer; that the casing-tubing annulus shall be loaded with an inert fluid and equipped with a pressure gauge at the surface.

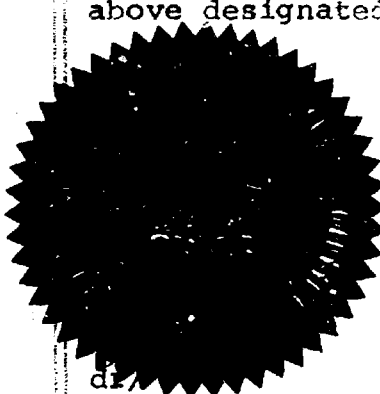
(3) That the subject waterflood project is hereby designated the Robinson-Jackson Waterflood Project and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

(4) That monthly progress reports of the waterflood project herein authorized shall be submitted to the Commission in accordance with Rules 704 and 1120 of the Commission Rules and Regulations.

(5) 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


BRUCE KING, Chairman

ALEX J. ARNETTO, Member

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

- CASE 4923: Application of Continental Oil Company for a non-standard gas proration unit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for a 360-acre non-standard gas proration unit comprising Lots 16, 17, and 18 and the SE/4 and E/2 SW/4 of Section 4, Township 21 South, Range 36 East, Eumont Gas Pool, Lea County, New Mexico, to be dedicated to its Meyer B-4 Well No. 4 located in Unit S of said Section 4.
- CASE 4924: Application of Texaco Inc. for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Devonian formation in the perforated interval from 7025 feet to 7366 feet in its New Mexico "BZ" State Well No. 1, a triple tubingless completion, located in Unit K of Section 2, Township 25 South, Range 37 East, North Justis-Devonian Pool, Lea County, New Mexico.
- CASE 4925: Application of Shenandoah Oil Corporation for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Robinson-Jackson Unit Area comprising 1160 acres, more or less, of Federal lands in Township 17 South, Range 29 East, Eddy County, New Mexico.
- CASE 4926: Application of Shenandoah Oil Corporation for a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in its Robinson-Jackson Unit Area by the injection of water into the Grayburg-San Andres formation through 16 wells in Sections 27, 34, and 35, Township 17 South, Range 29 East, Grayburg-Jackson Pool, Eddy County, New Mexico.
- CASE 4927: Application of Union Oil Company of California for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Devonian formation in the perforated interval from 12,000 feet to 12,010 feet in its Federal "D" Well No. 2 located in Unit J of Section 31, Township 9 South, Range 36 East, West Crossroads-Devonian Pool, Lea County, New Mexico.
- CASE 4928: Application of Union Oil Company of California for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Morrow formation underlying all of Section 11, Township 21 South, Range 25 East, Catclaw Draw-Morrow Gas Pool, Eddy County, New Mexico, to be dedicated to the Atlantic Richfield Oil Company Pure-Federal Well No. 11 located in Unit K of said Section 11. Applicant further seeks a provision for the payment of proper costs to be borne by applicant for such well and the related well equipment, a provision for allocation of actual operating costs, and the establishment of charges for supervision of such well and the designation of an operator thereof; and for such other relief as proper. Also to be considered will be the risk involved in drilling the subject well.

SHENANDOAH OIL CORPORATION

DIAGRAMATIC SKETCH OF INJECTION WELL

Lease: F. M. Robinson A
Well No. 4
Location: Unit G, 1,980 ft. ENL & 1,980 ft.
FEL, Sec. 34, T-17S, R-29E
Eddy County, New Mexico
Elevation: 3,516'

8 1/4 in. csg. @ 401 ft.
with 50 sx. cnt. (Est. cnt. top @ 101')

Grayburg
2,359'

2,574
2,584
2,588
2,596
2,620
2,634

Metex 300 BPD

Loco Hills 300 BPD

San Andres
2,774'

CIBP

2,970

7 in. csg. @ 2,995 ft.
with 100 sx. cnt. (Est. cnt. top @ 1,695')

*Jackson
zone
300 BPD*

NOTE: A 4 1/2" OD. liner will be set and cemented over open hole section. The Grayburg and San Andres formations will be perforated in selected intervals. Injection into the selected intervals will be separated by using bottom hole flow regulators and packers on one string of 2 3/8" OD. tubing.

TD
3,181'

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. _____
CASE NO. _____

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
50% EXHIBIT NO. *C*
CASE NO. *4926*

Exhibit "C-1"

SHEVANDOAN OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

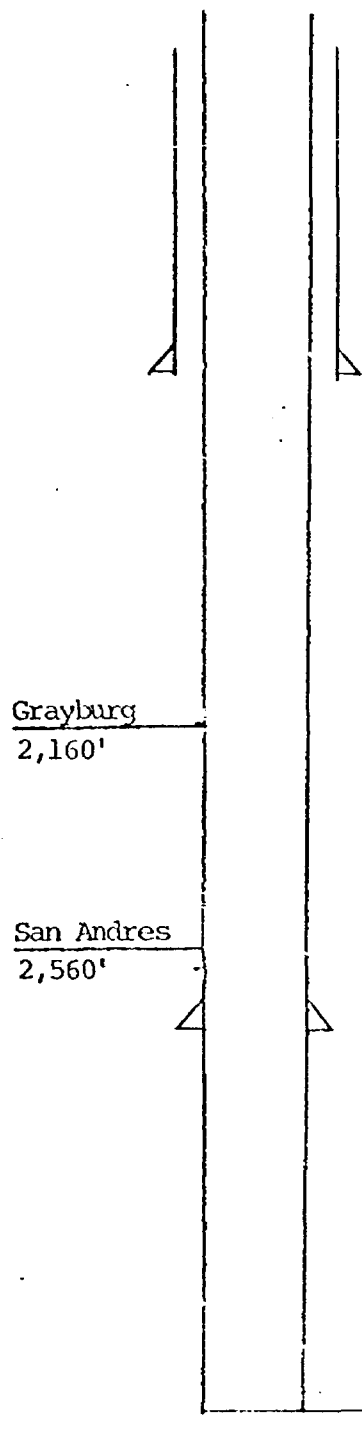
Lease: F. M. Robinson A

Well No. 7

Location: Unit I, 1,980 ft. FSL & 660 ft.
FEL, Sec. 27, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,566'



8 5/8 in. csg. @ 404 ft.
with 100 sx. cmt. (Est. cmt. top @ surface)

7 in. csg. @ 2,768 ft.
with 100 sx. cmt. (Est. cmt. top @ 1,468')

NOTE: No log available. A 4 1/2" OD. liner
will be set and cemented over open
hole section. The Grayburg and San
Andres formations will be perforated
in selected intervals. Injection in-
to the selected intervals will be sep-
arated by using bottom hole flow reg-
ulators and packers on one string of
2 3/8" OD. tubing.

TD
2,975'

Exhibit "C-2"

SHENANDOAH OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson A

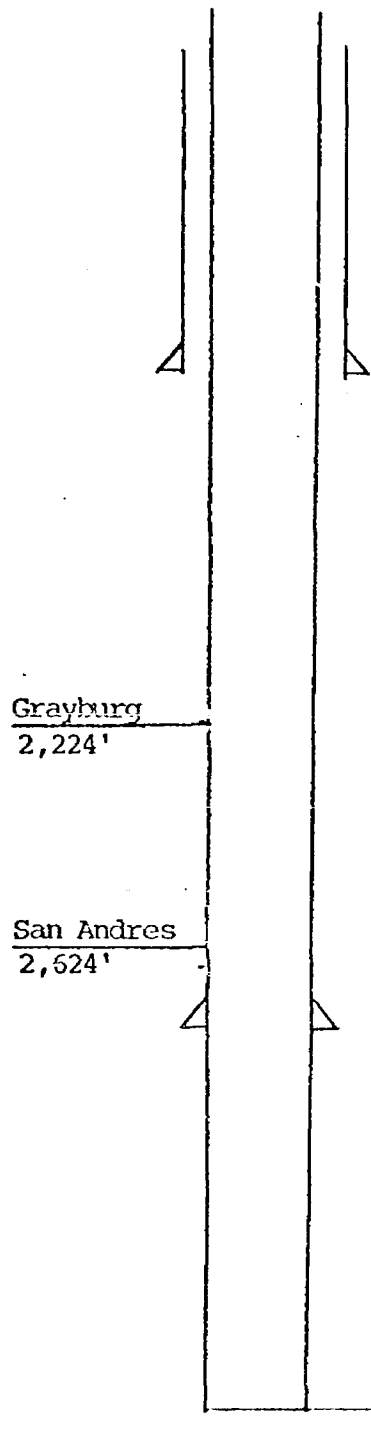
Well No. 9

Location: Unit C, 660 ft. FSL & 1,980 ft.

FEL, Sec. 27, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,556'



8 1/4 in. csg. @ 368 ft.
with 50 sx. cmt. (Est. cmt. top @ 68',)

Grayburg
2,224'

San Andres
2,524'

7 in. csg. @ 2,829 ft.
with 100 sx. cmt. (Est. cmt. top @ 1,529')

NOTE: No log available. A 4 1/2" OD. liner will be set and cemented over open hole section. The Grayburg and San Andres formations will be perforated in selected intervals. Injection into the selected intervals will be separated by using bottom hole flow regulators and packers on one string of 2 3/8" OD. tubing.

TD
3,014'

Exhibit "C-3"

SHEWANDOH OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson A

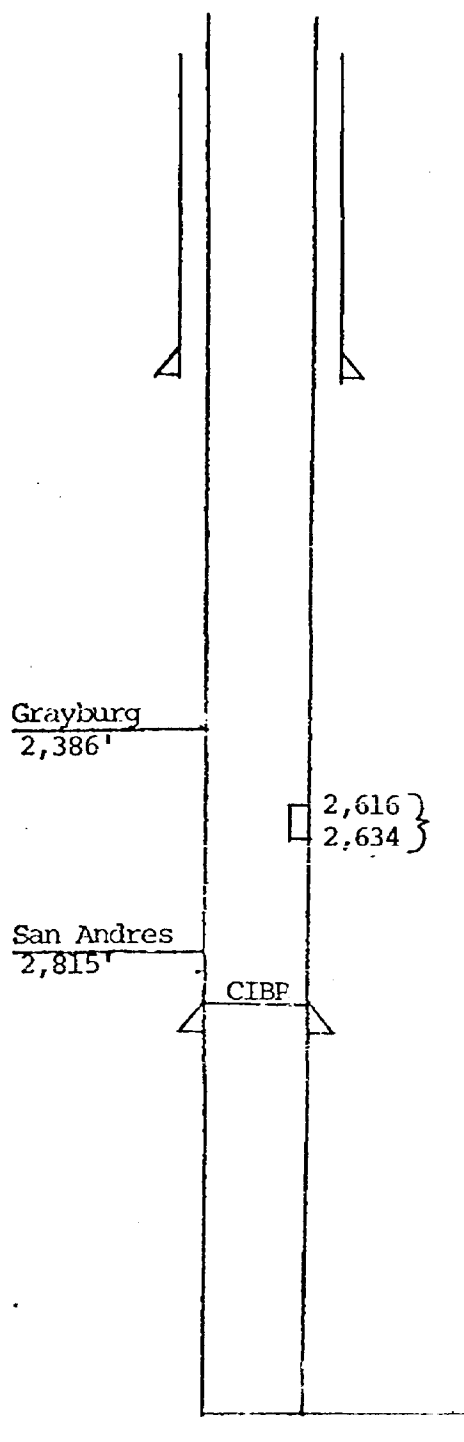
Well No. 11

Location: Unit E, 1,980 ft. FNL & 660 ft.

FWL, Sec. 35, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,539'



8 1/4 in. csg. @ 450 ft.
with 50 sx. cmt. (Est. cmt. top @ 150')

Present perf.

7 in. csg. @ 3,034 ft.
with 100 sx. cmt. (Est. cmt. top @ 1,734')

NOTE: A 4 1/2" OD. liner will be set and cemented over open hole section. The Grayburg and San Andres formations will be perforated in selected intervals. Injection into the selected intervals will be separated by using bottom hole flow regulators and packers on one string of 2 3/8" OD. tubing.

Exhibit "C-4"

SIENWDOAH OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson A

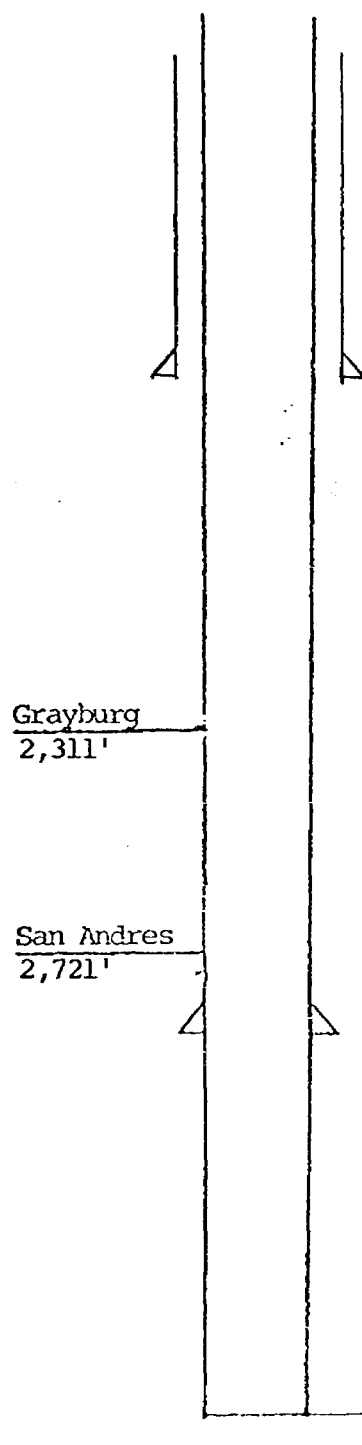
Well No. 12

Location: Unit A, 660 ft. FNL & 654 ft.

FEL, Sec. 34, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,558'



8 1/4 in. csg. @ 430 ft.
with 50 sx. cmt. (Est. cmt. top @ 130!)

7 in. csg. @ 2,921 ft.
with 100 sx. cmt. (Est. cmt. top @ 1,621')

NOTE: No log available. A 4 1/2" OD. liner
will be set and cemented over open
hole section. The Grayburg and San
Andres formations will be perforated in
in selected intervals. Injection in-
to the selected intervals will be sep-
arated by using bottom hole flow reg-
ulators and packers on one string of
2 3/8" OD. tubing.

Exhibit "C-5"

SHEVANDOAH OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson B

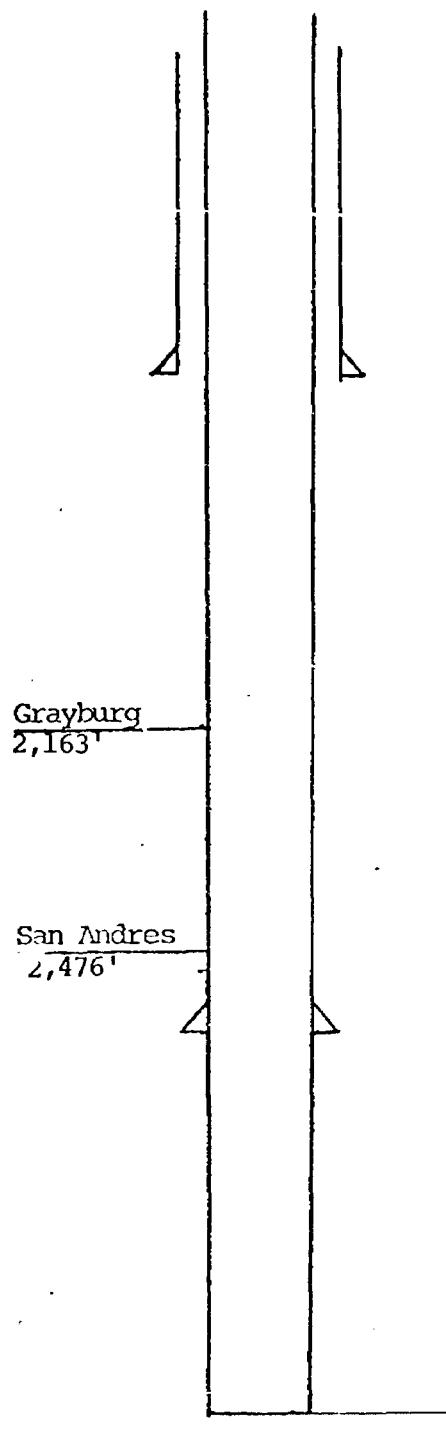
Well No. 1

Location: Unit A, 660 ft. ENL & 660 ft.

FEL, Sec. 27, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,566'



8 1/4 in. csg. @ 982 ft.
with 100sx. cmt. (Est. cmt. top @ 382')

7 in. csg. @ 2,305 ft.
with 100 sx. cmt. (Est. cmt. top @ 1,005')

NOTE: A 4 1/2" OD. liner will be set and cemented over open hole section. The Grayburg and San Andres formations will be perforated in selected intervals. Injection into the selected intervals will be separated by using bottom hole flow regulators and packers on one string of 2 3/8" OD. tubing. No log available.

TD
2,798'

Exhibit "C-6"

SHEVANDOAH OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson B

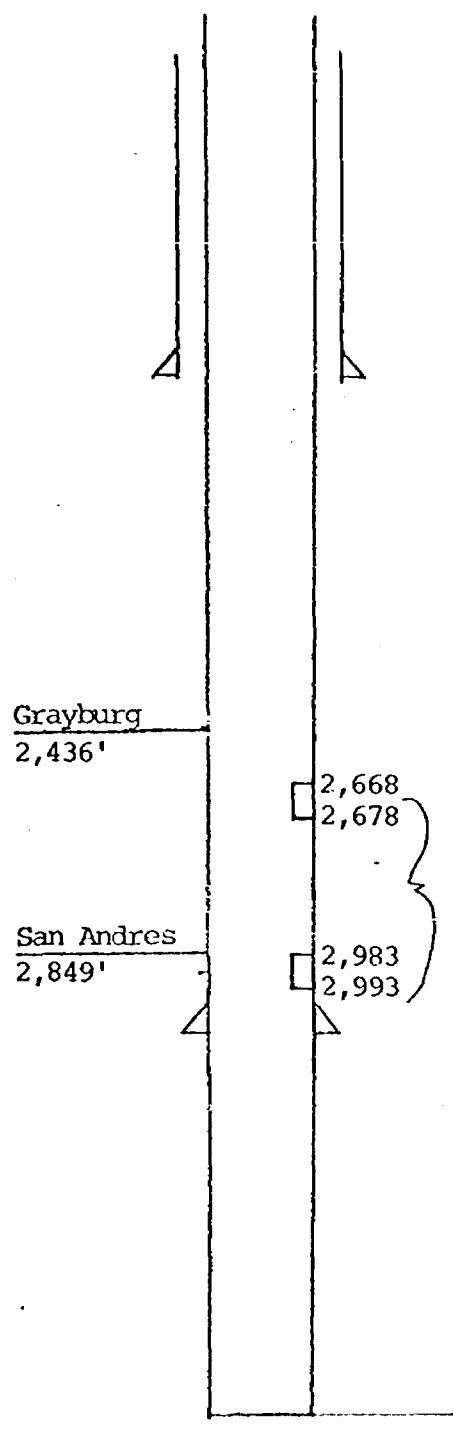
Well No. 4

Location: Unit A, 660 ft. FEL & 660 ft.

FNL, Sec. 35, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,563'



8 5/8 in. csg. @ 428 ft.
with 50 sx. cmt. (Est. cmt. top @ 128')

Present perf.

7 in. csg. @ 3,050 ft.
with 100 sx. cmt. (Est. cmt. top @ 1,750')

NOTE: A 4 1/2" OD. liner will be set and
cemented over open hole section.
The Grayburg and San Andres form-
ations will be perforated in selected
intervals. Injection into the se-
lected intervals will be separated
by using bottom hole flow regulators
and packers on one string of 2 3/8"
OD. tubing.

TD
3,191'

Exhibit "C-7"

SHENANDOAH OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson B

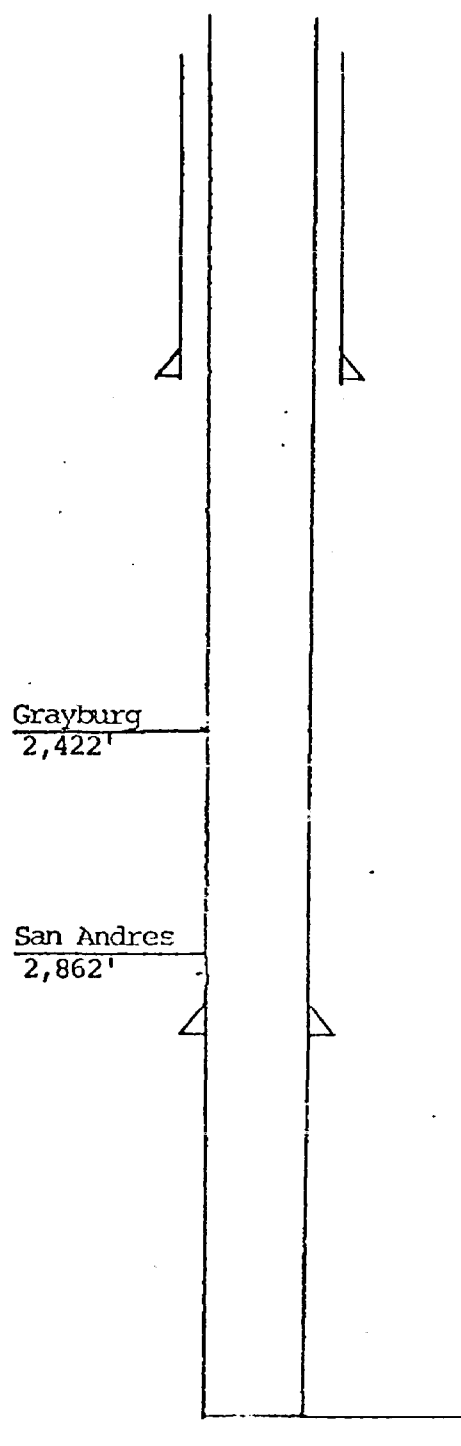
Well No. 6

Location: Unit G, 1,980 ft. FNL & 1,980 ft.

FEL, Sec. 35, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,563'



8 5/8 in. csg. @ 465 ft.
with 50 sx. cmt. (Est. cmt. top @ 265')

7 in. csg. @ 3,055 ft.
with 100 sx. cmt. (Est. cmt. top @ 1,755')

NOTE: No log available. A 4 1/2" OD. liner
will be set and cemented over open
hole section. The Grayburg and San
Andres formations will be perforated
in selected intervals. Injection in-
to the selected intervals will be sep-
arated by using bottom hole flow reg-
ulators and packers on one string of
2 3/8" OD. tubing.

Exhibit "C-8"

SHENANDOAH OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson B

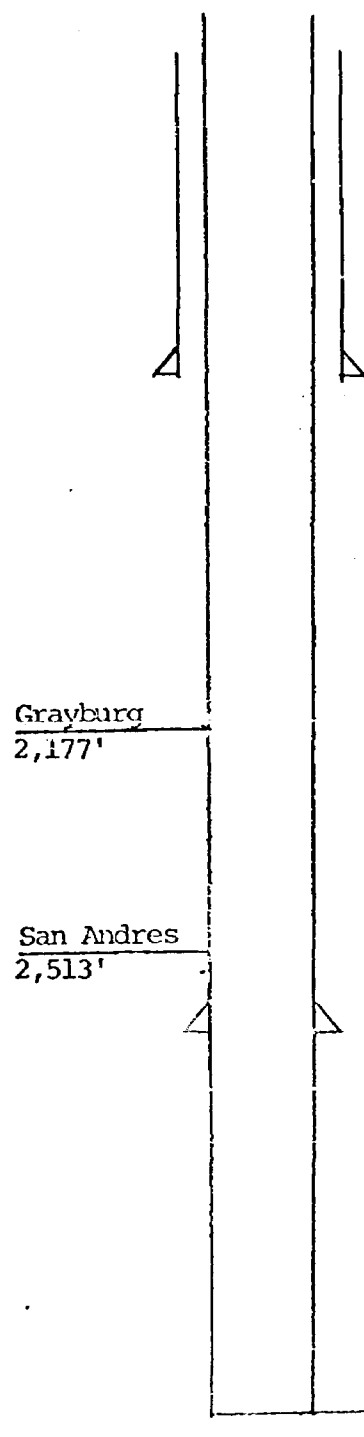
Well No. 8

Location: Unit K, 1,980 ft. FWL & 1,980 ft.

FSL, Sec. 27, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,526'



8 1/4 in. csg. @ 305 ft.
with 50 sx. cmt. (Est. cmt. top @ 5!)

Grayburg
2,177'

San Andres
2,513'

7 in. csg. @ 2,690 ft.
with 100 sx. cmt. (Est. cmt. top @ 1,390')

NOTE: Used adjacent well log B-32 for correlation. A 4 1/2 OD. liner will be set and cemented over open hole section. The Grayburg and San Andres formations will be perforated in selected intervals. Injection into the selected intervals will be separated by using bottom hole flow regulators and packers on one string of 2 3/8" OD. tubing.

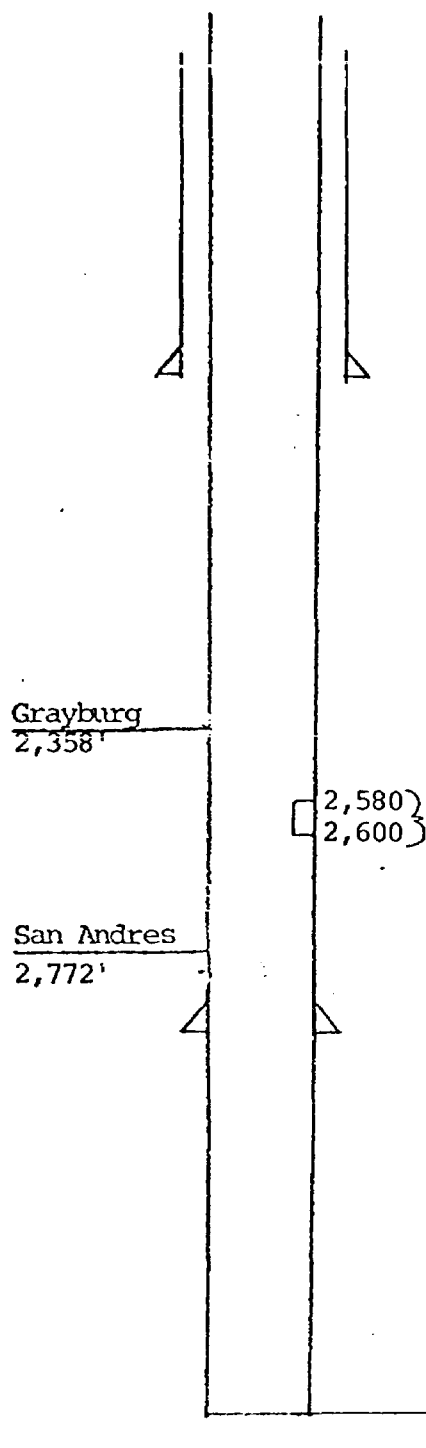
TD
2,950'

Exhibit "C-9"

SHEWANDOAH OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson B
Well No. 11
Location: Unit C, 660 ft. FNL & 1,980 ft.
FWL, Sec. 35, T-17S, R-29E
Eddy County, New Mexico
Elevation: 3,550'



8 1/4 in. csg. @ 526 ft.
with 50 sx. cmt. (Est. cmt. top @ 226!)

Present perf.

7 in. csg. @ 2,980 ft.
with 100 sx. cmt. (Est. cmt. top @ 1,680')

NOTE: A 4 1/2" OD. liner will be set and
cemented over open hole section.
The Grayburg and San Andres form-
ations will be perforated in selected
intervals. Injection into the se-
lected intervals will be separated
by using bottom hole flow regulators
and packers on one string of 2 3/8"
OD. tubing.

Exhibit "C-10"

SHEWANDOAH OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson B

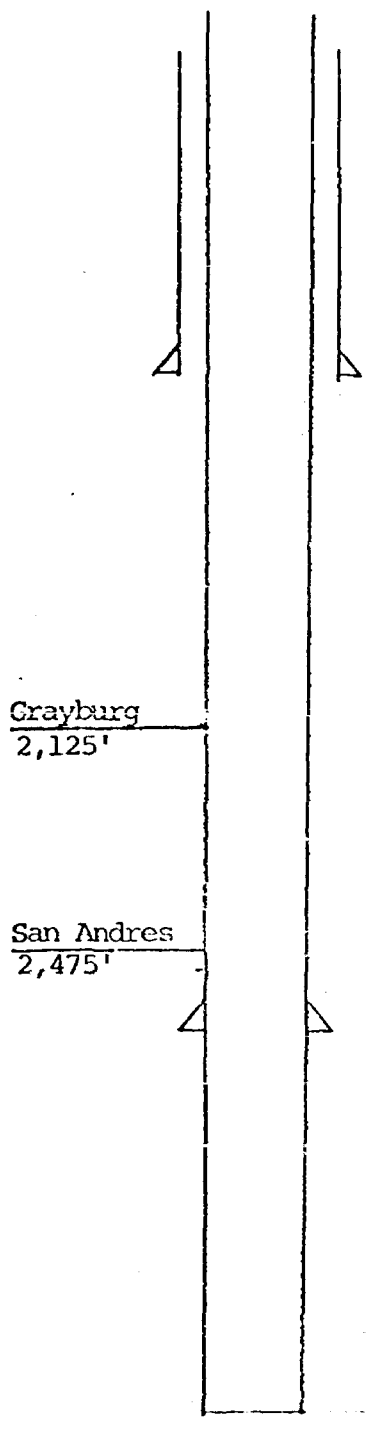
Well No. 15

Location: Unit G, 1,980 ft. FNL & 1,980 ft.

FEL, Sec. 27, T-17S. R-29E

Eddy County, New Mexico

Elevation: 3,548'



8 1/4 in. csg. @ 335 ft.
with 50 sx. cnt. (Est. cnt. top @ 35'.)

7 in. csg. @ 2,661 ft.
with 100 sx. cnt. (Est. cnt. top @ 1,361')

NOTE: No log available. A 4 1/2" OD. liner
will be set and cemented over open
hole section. The Grayburg and San
Andres formations will be perforated
in selected intervals. Injection in-
to the selected intervals will be sep-
arated by using bottom hole flow reg-
ulators and packers on one string of
2 3/8" OD. tubing.

Exhibit "C-11"

SHENANDOAH OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson B

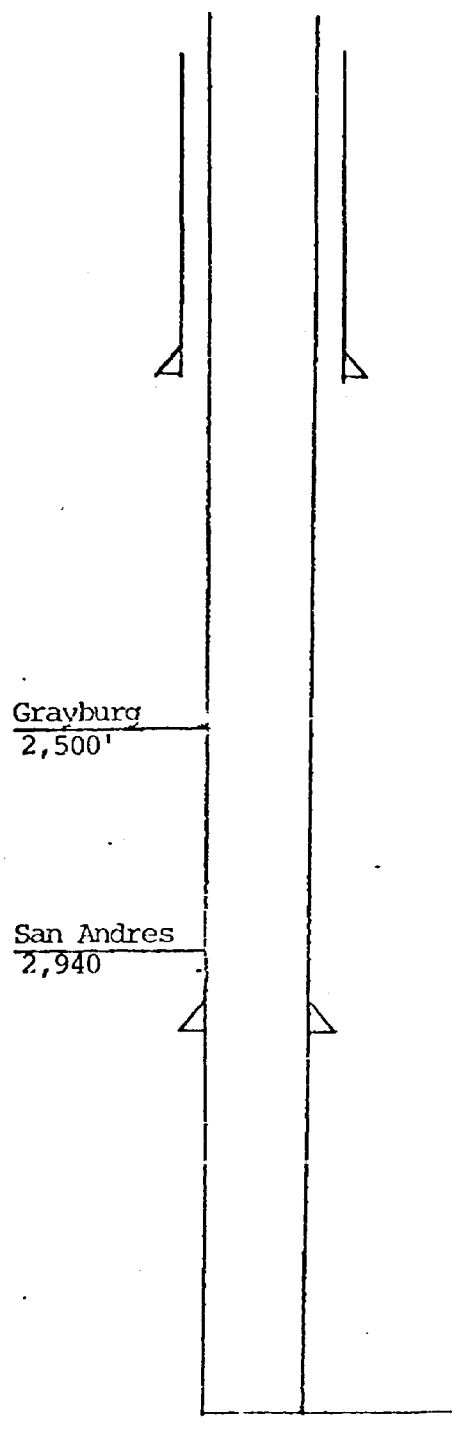
Well No. 16

Location: Unit I, 1,980 ft. FSL & 660 ft.

FEL, Sec. 35, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,552'



8 1/4 in. csg. @ 505 ft.
with 50 sx. cmt. (Est. cmt. top @ 205')

7 in. csg. @ 3,157 ft.
with 100 sx. cmt. (Est. cmt. top @ 1,857')

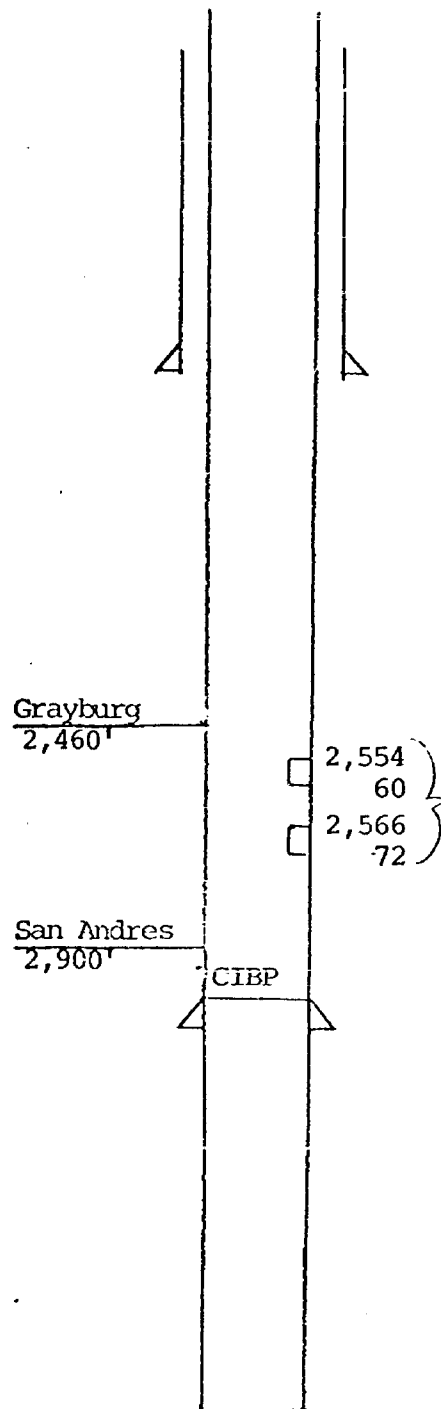
NOTE: A 4 1/2" OD. liner will be set and
cemented over open hole section.
The Grayburg and San Andres forma-
tions will be perforated in selected
intervals. Injection into the se-
lected intervals will be separated
by using bottom hole flow regulators
and packers on one string of 2 3/8"
OD tubing.

Exhibit "C-12"

SHENANDOAH OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson B
Well No. 17
Location: Unit K, 1,980 ft. FSL & 1,980 ft.
FWL, Sec. 35, T-17S, R-29E
Eddy County, New Mexico
Elevation: 3,542'



8 1/4 in. csg. @ 492ft.
with 50 sx. cmt. (Est. cmt. top @ 292')

Present perf.

7 in. csg. @ 3,165 ft.
with 100 sx. cmt. (Est. cmt. top @ 1,855')

NOTE: A 4 1/2" OD. liner will be set and
cemented over open hole section.
The Grayburg and San Andres forma-
tions will be perforated in selected
intervals. Injection into the se-
lected intervals will be separated
by using bottom hole flow regulators
and packers on one string of 2 3/8"
OD tubing.

TD 3,265'

Exhibit "C-13"

SHENANDOAH OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson "B"

Well No. 18

Location: Unit O, 660 ft. FSL & 1,980 ft.

FEL, Sec. 35, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,537'

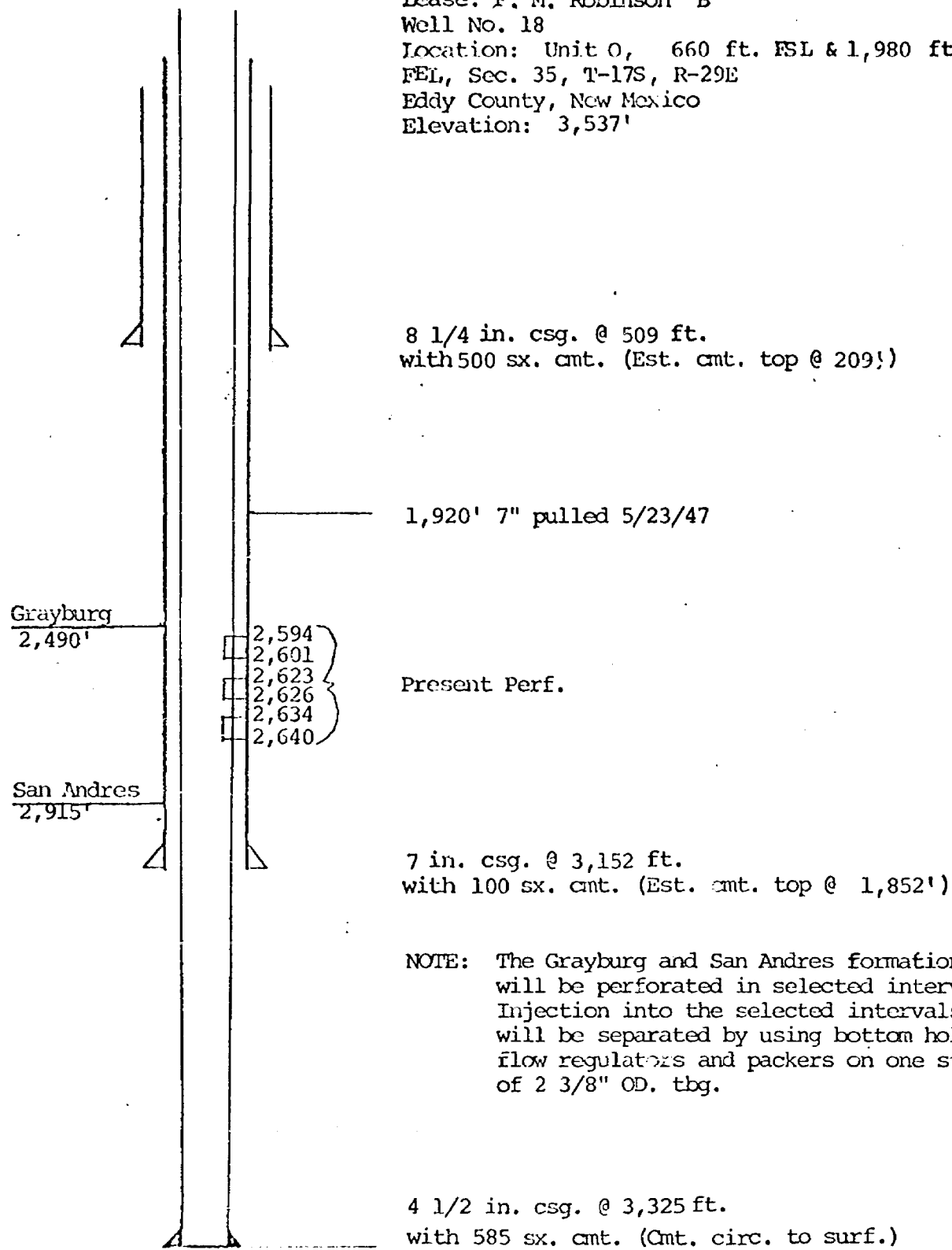


Exhibit "C-14"

SHENANDOAH OIL CORPORATION

DIAGRAMATIC SKETCH OF INJECTION WELL

Lease: F. M. Robinson B

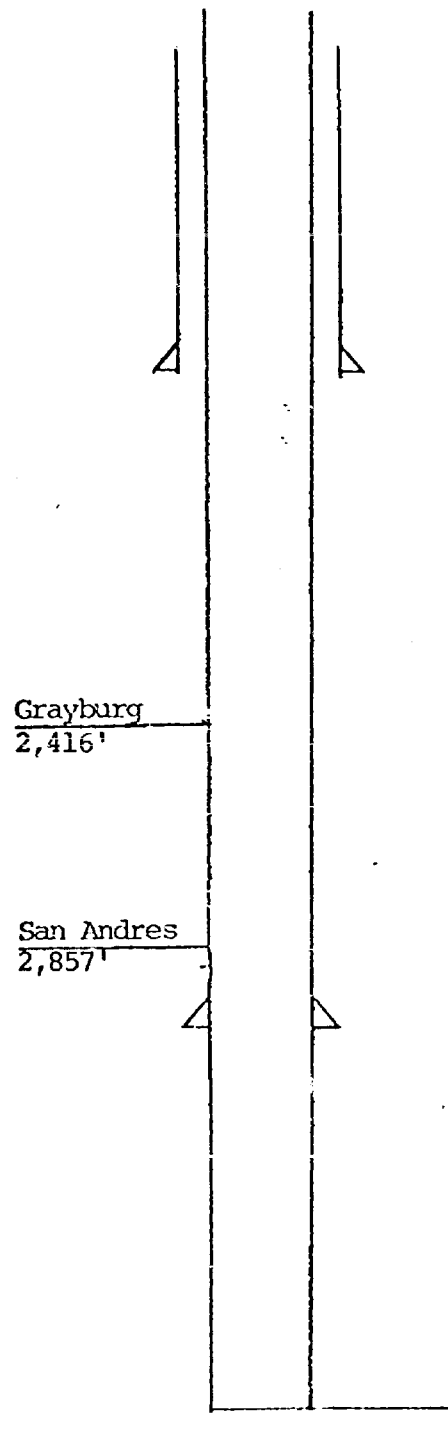
Well No. 19

Location: Unit I, 1,980 ft. FSL & 660 ft.

FEL, Sec. 34, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,534'



8 1/4 in. csg. @ 360 ft.
with 50 sx. cmt. (Est. cmt. top @ 60')

7 in. csg. @ 3,076 ft.
with 100 sx. cmt. (Est. cmt. top @ 1,776')

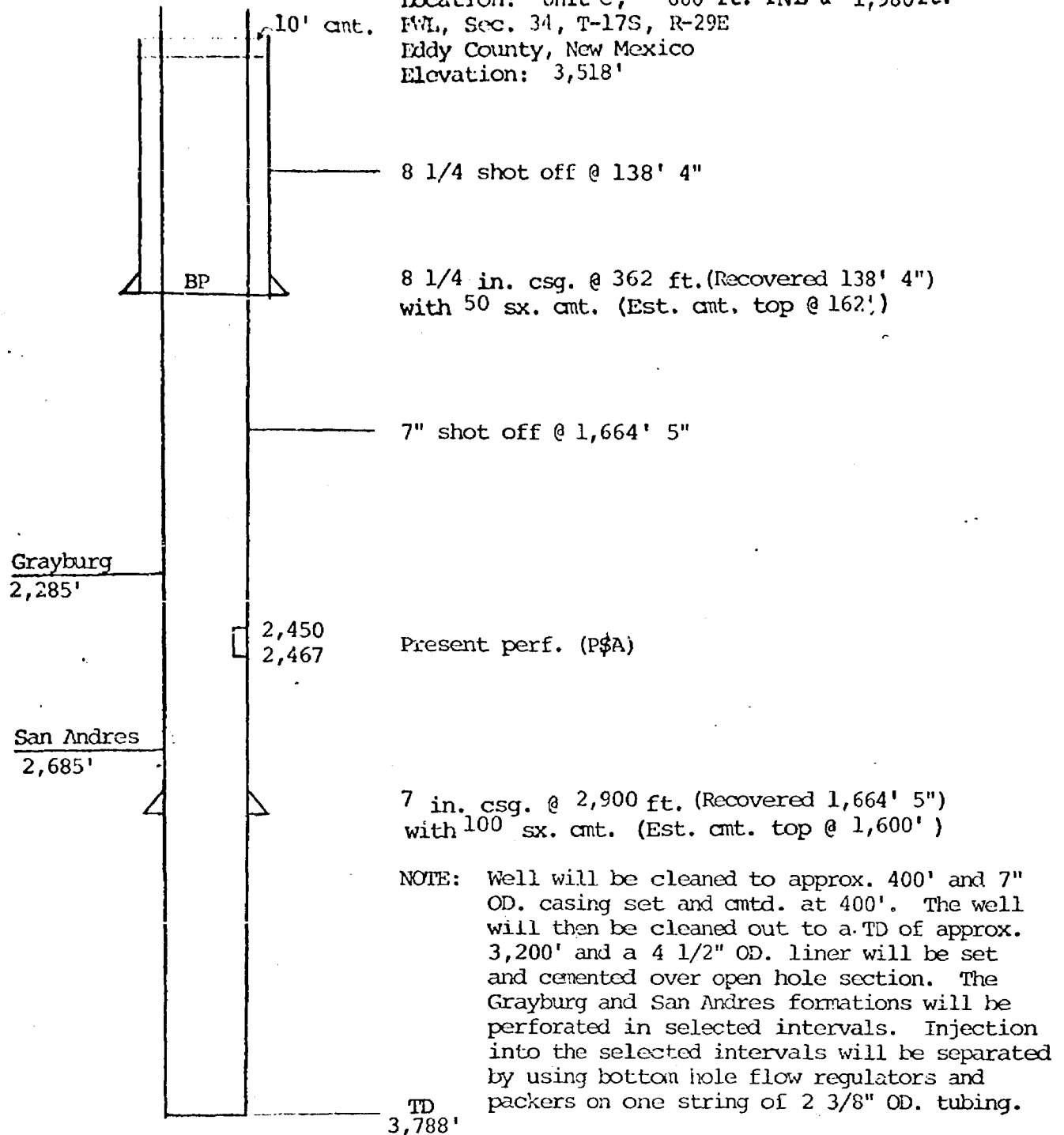
NOTE: A 4 1/2" OD. liner will be set and cemented over open hole section. The Grayburg and San Andres formations will be perforated in selected intervals. Injection into the selected intervals will be separated by using bottom hole flow regulators and packers on one string of 2 3/8" OD. tubing.

Exhibit " C-15 "

SHENANDOAH OIL CORPORATION

DIAGRAMATIC SKETCH OF INJECTION WELL

Lease: F. M. Robinson B
Well No. 20
Location: Unit C, 660 ft. FNL & 1,980 ft.
FWL, Sec. 34, T-17S, R-29E
Eddy County, New Mexico
Elevation: 3,518'



NOTE: Well will be cleaned to approx. 400' and 7" OD. casing set and cmtd. at 400'. The well will then be cleaned out to a TD of approx. 3,200' and a 4 1/2" OD. liner will be set and cemented over open hole section. The Grayburg and San Andres formations will be perforated in selected intervals. Injection into the selected intervals will be separated by using bottom hole flow regulators and packers on one string of 2 3/8" OD. tubing.

Exhibit "C-16"

SHEVANDOAH OIL CORPORATION

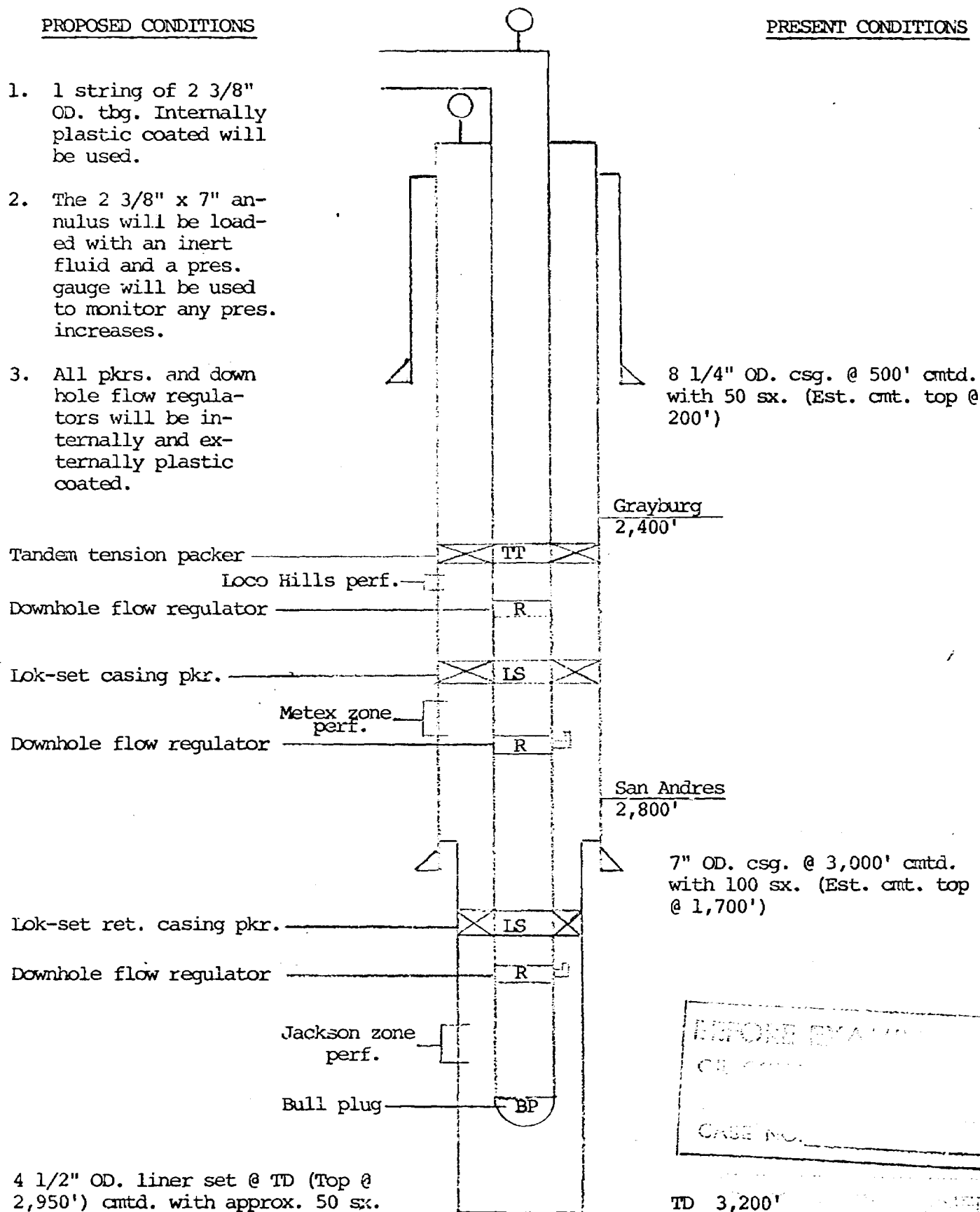
DIAGRAMATIC SKETCH OF TYPICAL INJECTION WELL

Robinson - Jackson Unit
Sections 27, 34, 35, T-17-S, R-29-E
Eddy County, New Mexico

PROPOSED CONDITIONS

1. 1 string of 2 3/8" OD. tbg. Internally plastic coated will be used.
2. The 2 3/8" x 7" annulus will be loaded with an inert fluid and a pres. gauge will be used to monitor any pres. increases.
3. All pkrs. and down hole flow regulators will be internally and externally plastic coated.

PRESENT CONDITIONS



BEFORE EXAMINATION
OR COPY
CASE NO. _____

TD 3,200' OVER NUTTER

SOC CASE NO. D

EST NO. 4926

Exhibit "D"

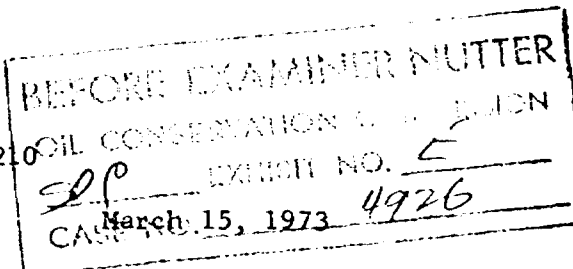


United States Department of the Interior

GEOLOGICAL SURVEY

MAR 16 1973

P. O. Drawer U
Artesia, New Mexico 88210
JENNINGS, CHRISTY & COPPLE



Jennings, Christy, and Copple
Post Office Box 1180
Roswell, New Mexico 88201

Gentlemen:

Your letter of March 8, 1973 requests approval for Shenandoah Oil Corporation to operate a waterflood of the Grayburg and San Andres formations in T. 17 S., R. 29 E., N.M.P.M., Eddy County, New Mexico on that portion of oil and gas leases described as follows:

Las Cruces 028775(a)

sec. 27: SE $\frac{1}{4}$
sec. 34: NE $\frac{1}{4}$
sec. 35: W $\frac{1}{2}$ NW $\frac{1}{4}$

Las Cruces 028775(b)

sec. 27: NE $\frac{1}{4}$, E $\frac{1}{2}$ W $\frac{1}{2}$
sec. 35: E $\frac{1}{2}$, E $\frac{1}{2}$ W $\frac{1}{2}$

Las Cruces 069147

sec. 34: NE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ SE $\frac{1}{4}$

Las Cruces 067910

sec. 34: E $\frac{1}{2}$ SE $\frac{1}{4}$
sec. 35: NW $\frac{1}{4}$ SW $\frac{1}{4}$

The flood pattern would be 80-acre 5-spct, and on a pattern with the surrounding waterflood projects. The plan proposes to convert to water injection the following wells:

<u>Well Number and Lease</u>	<u>Location</u>
4 - Robinson "A"	1980/N&E sec. 34
7 - Robinson "A"	1980/S 660/E sec. 27
9 - Robinson "A"	660/S 1980/E sec. 27
11 - Robinson "A"	1980/N 660/W sec. 35
12 - Robinson "A"	660/N 654/E sec. 34
1 - Robinson "B"	660/N&E sec. 27
4 - Robinson "B"	660/N&E sec. 35
6 - Robinson "B"	1980/N&E sec. 35
8 - Robinson "B"	1980/S&W sec. 27
11 - Robinson "B"	660/N 1980/W sec. 35

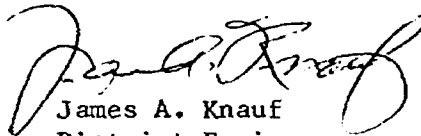
<u>Well Number and Lease</u>	<u>Location</u>
15 - Robinson "B"	1980/N&E sec. 27
16 - Robinson "B"	1980/S 660/E sec. 35
17 - Robinson "B"	1980/S&W sec. 35
18 - Robinson "B"	660/S 1980/E sec. 35
19 - Robinson "B"	1980/S 660/E sec. 34
20 - Robinson "B"	660/N 1980/W sec. 34

The plan for operating the above described waterflood project as proposed in the application is satisfactory to this office and hereby approved subject to approval by the New Mexico Oil Conservation Commission and the following:

1. This project will be operated in compliance with the New Mexico Oil Conservation Commission regulations governing waterflood operations.
2. Prior to commencing operations, unless the proposed unit is approved, proper authority to operate on above described leases will be obtained.
3. A development plan for surface use will be submitted which will include information in regard to:
 - a. Plats of any additional roads or pipelines for flowlines, injection lines or water supply, which may be necessary for this project. The Bureau of Land Management will be consulted on right-of ways or other easements not covered under the oil and gas lease agreements.
 - b. Plats or diagrams to indicate size, description, and location of any additional installations of injection plants, treating plants, storage batteries, emergency water pits, or other necessary use of the surface for this project.
 - c. Plans for restoration of the surface.
4. Prior approval will be obtained for any change or deviation from the original plans or revision thereof.
5. The usual notice and reports of workovers, conversions, injection commencement or suspension, etc. of all wells involved will be timely submitted.

6. Duplicate copies of a monthly progress report (N.M.O.C. form C-120 acceptable) are to be submitted to this office showing the volume of water injected and average pressure for the injection wells and production for the producing wells in the project area.

Sincerely yours,



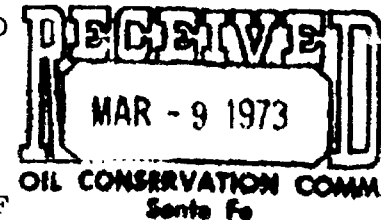
James A. Knauf
District Engineer

RLB:ih 3/15/73

cc:
Roswell

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO



IN THE MATTER OF THE APPLICATION OF
SHENANDOAH OIL CORPORATION TO INSTITUTE
A WATERFLOOD PROJECT BY THE INJECTION OF
WATER INTO THE GRAYBURG AND SAN ANDRES
FORMATIONS THROUGH SIXTEEN INJECTION WELLS
TO BE LOCATED IN SECTIONS 27, 34 AND 35,
TOWNSHIP 17 SOUTH, RANGE 29 EAST, GRAYBURG
JACKSON (Q.G.SA.) FIELD, EDDY COUNTY, NEW
MEXICO.

Case 4926

APPLICATION FOR APPROVAL OF
ROBINSON JACKSON WATERFLOOD PROJECT

Comes now the Applicant, Shenandoah Oil Corporation, and
hereby makes application for approval of a waterflood project pur-
suant to Rule 701 of the Rules and Regulations of the Commission
and in support thereof states:

1. Applicant desires to initiate a waterflood project
to inject fresh water into the Grayburg and San Andres formations
in sixteen existing wells on the following described tracts:

<u>WELL NUMBER</u>	<u>LOCATION</u>
F. M. Robinson "A" 4	Unit G, 1,980' FNL & 1,980' FEL Sec. 34, T-17-S, R-29-E
F. M. Robinson "A" 7	Unit I, 1,980' FSL & 660' FEL Sec. 27, T-17-S, R-29-E
F. M. Robinson "A" 9	Unit O, 660' FSL & 1,980' FEL Sec. 27, T-17-S, R-29-E
F. M. Robinson "A" 11	Unit E, 1,980' FNL & 660' FWL Sec. 35, T-17-S, R-29-E
F. M. Robinson "A" 12	Unit A, 660' FNL & 654' FEL Sec. 34, T-17-S, R-29-E
F. M. Robinson "B" 1	Unit A, 660' FNL & 660' FEL Sec. 27, T-17-S, R-29-E

BUCKET MAIL
Date 3/15/73

<u>WELL NUMBER</u>	<u>LOCATION</u>
F. M. Robinson "B" 4	Unit A, 660' FEL & 660' FNL Sec. 35, T-17-S, R-29-E
F. M. Robinson "B" 6	Unit G, 1,980' FNL & 1,980' FEL Sec. 35, T-17-S, R-29-E
F. M. Robinson "B" 8	Unit K, 1,980' FWL & 1,980' FSL Sec. 27, T-17-S, R-29-E
F. M. Robinson "B" 11	Unit C, 660' FNL & 1,980' FWL Sec. 35, T-17-S, R-29-E
F. M. Robinson "B" 15	Unit G, 1,980' FNL & 1,980' FEL Sec. 27, T-17-S, R-29-E
F. M. Robinson "B" 16	Unit I, 1,980' FSL & 660' FEL Sec. 35, T-17-S, R-29-E
F. M. Robinson "B" 17	Unit K, 1,980' FSL & 1,980' FWL Sec. 35, T-17-S, R-29-E
F. M. Robinson "B" 18	Unit O, 660' FSL & 1,980' FEL Sec. 35, T-17-S, R-29-E (Outside Unit Area)
F. M. Robinson "B" 19	Unit I, 1,980' FSL & 660' FEL Sec. 34, T-17-S, R-29-E
F. M. Robinson "B" 20	Unit C, 660' FNL & 1,980' FWL Sec. 34, T-17-S, R-29-E (Outside Unit Area)

2. That the above wells and all other wells in the area have reached an advanced state of depletion and are stripper wells.

3. That Applicant feels that the waterflooding of the Grayburg and San Andres formations is feasible and that flooding will result in the increased ultimate recovery of oil and prevent waste.

4. That other operators are successfully waterflooding on all sides of this project. That General American Oil Company is waterflooding the Grayburg formation to the East in Section 26, Newmont Oil Company is successfully waterflooding the Grayburg

formation to the South in Sections 2 and 3, Township 18 South, Range 29 East, that Tenneco Oil Company is waterflooding to the West in Sections 27 and 28, and that Sun Oil Company is waterflooding the San Andres formation to the North in Section 22.

5. That when need arises, upon administrative approval, Applicant should be permitted to convert to water injection wells additional wells within its lease boundaries or to drill additional injection wells in the area described in Exhibit "A" attached hereto.

6. Applicant proposes to inject fresh water and produced water when available in the Metex and Loco Hills zones of the Grayburg formation at the approximate depth of 2,359 feet and into the Jackson zone of the San Andres formation at the approximate depth of 2,774 feet, and into additional zones within the Grayburg and San Andres formations that may warrant water injection after the wells have been worked over. Applicant proposes to inject 300 barrels of water per day into each of the two zones in the Grayburg formation and 300 barrels of water per day into the San Andres formation, or a total of 900 barrels per day. The injection areas of the various wells are set forth on Exhibit "C". Injection water will be purchased from a commercial water company and the injection plant will be capable of handling produced water for reinjection.

7. That in support of this application and in accordance with the provisions of Rule 701-B, Applicant submits herewith the following exhibits:

Exhibit A - Plat showing the location of Applicant's project and lands embraced therein.

Exhibit B - Plat showing location of Applicant's acreage and location of all other wells within the radius of two miles from the proposed injection wells.

Exhibit C - Nos. 1-16 Diagrametic Sketches of the proposed injection wells showing estimated tops of the cement, perforations and depths.

Exhibit D - Diagrametic Sketch showing the typical down hole equipment to be installed in each injection well.

At the hearing the Applicant will furnish available logs of the proposed injection wells.

WHEREFORE, Applicant requests the Commission to set this matter sown for hearing before an examiner at an early date, publish notice as required by law and, after hearing, issue its Order:

1. Authorizing the waterflood project and the injection of water into the Grayburg and San Andres formations in the sixteen injection wells located in Sections 27, 34 and 35, Township 17 South, Range 29 East.

2. Establishing rules for administrative expansion and conversion of additional wells to water injection wells.

Respectfully submitted,

SHENANDOAH OIL CORPORATION

By 

James T. Jennings, for
JENNINGS, CHRISTY & COPPLE
Attorneys for Applicant
P. O. Box 1180
Roswell, New Mexico 88201

SHEVANDOAH OIL CORPORATION

DIAGRAMATIC SKETCH OF INJECTION WELL

Lease: F. M. Robinson A

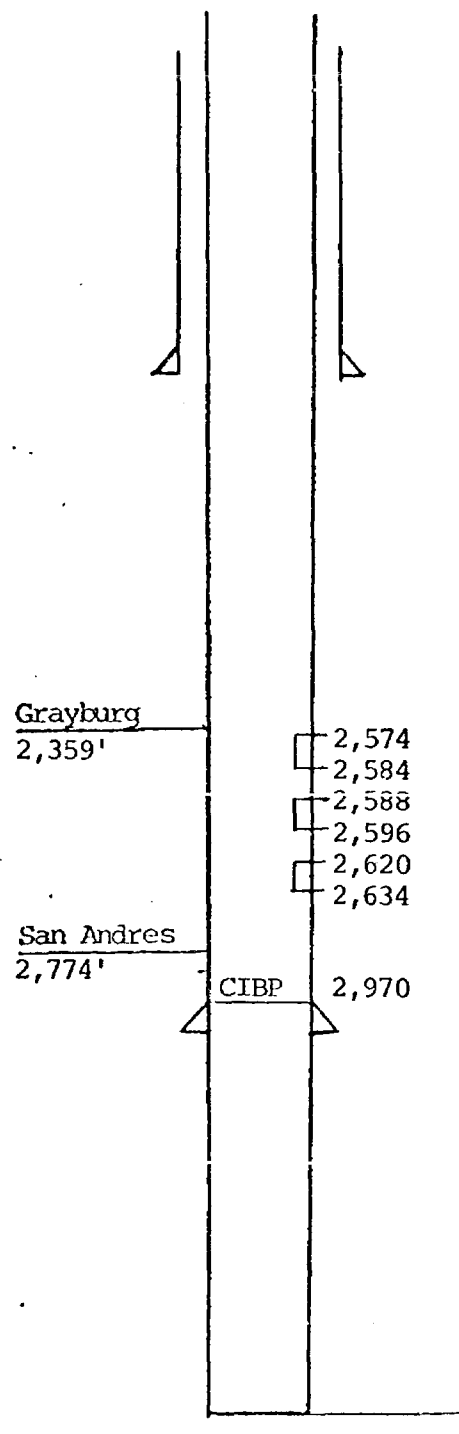
Well No. 4

Location: Unit G, 1,980 ft. FNL & 1,980 ft.

FEL, Sec. 34, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,516'



8 1/4 in. csg. @ 401 ft.
with 50 sx. cmt. (Est. cmt. top @ 1,011')

7 in. csg. @ 2,995 ft.
with 100 sx. cmt. (Est. cmt. top @ 1,695')

NOTE: A 4 1/2" OD. liner will be set and cemented over open hole section. The Grayburg and San Andres formations will be perforated in selected intervals. Injection into the selected intervals will be separated by using bottom hole flow regulators and packers on one string of 2 3/8" OD. tubing.

Exhibit "C-1" Case 4926

SHEVANDOAH OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson A

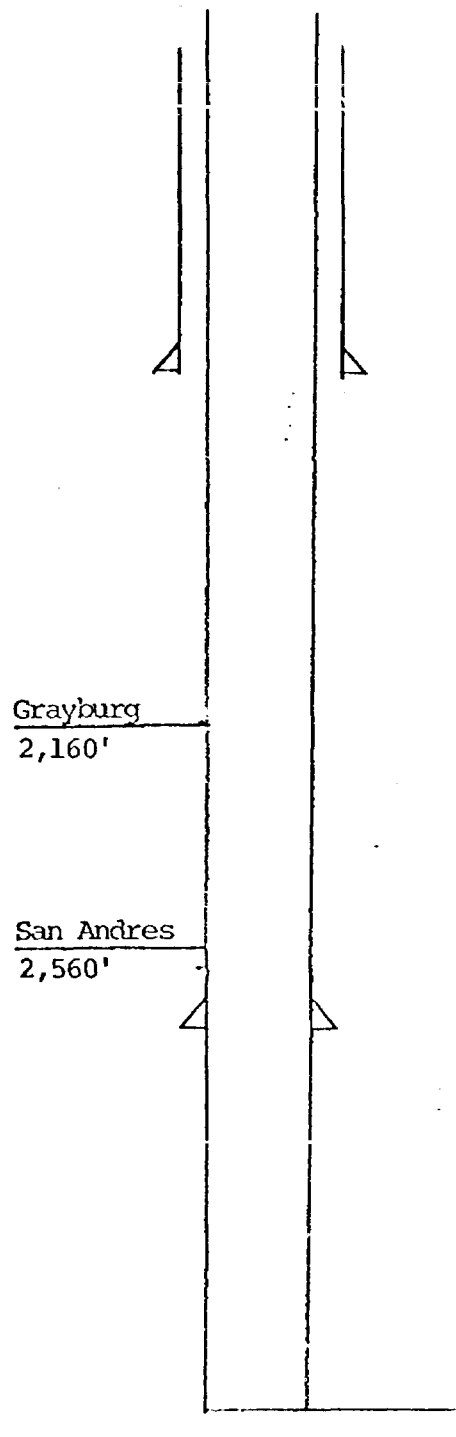
Well No. 7

Location: Unit I, 1,980 ft. FSL & 660 ft.

FEL, Sec. 27, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,566'



8 5/8 in. csg. @ 404 ft.
with 100 sx. cmt. (Est. cmt. top @ surface)

7 in. csg. @ 2,768 ft.
with 100 sx. cmt. (Est. cmt. top @ 1,468')

NOTE: No log available. A 4 1/2" OD. liner
will be set and cemented over open
hole section. The Grayburg and San
Andres formations will be perforated
in selected intervals. Injection in-
to the selected intervals will be sep-
arated by using bottom hole flow reg-
ulators and packers on one string of
2 3/8" OD. tubing.

Exhibit "C-2" Case 4926

SHEWANDOAH OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson A

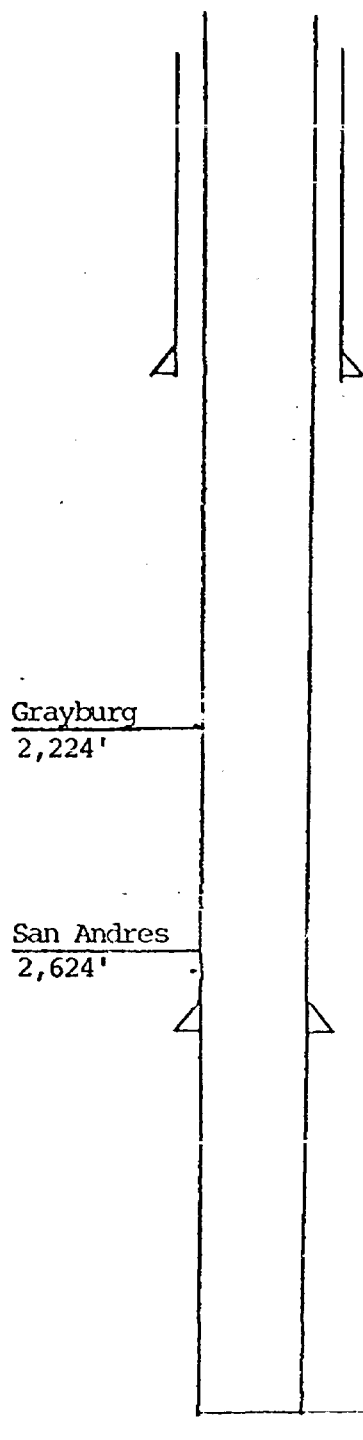
Well No. 9

Location: Unit G, 660 ft. FSL & 1,980 ft.

FEL, Sec. 27, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,556'



8 1/4 in. csg. @ 368 ft.
with 50 sx. cnt. (Est. cnt. top @ 68',)

7 in. csg. @ 2,829 ft.
with 100 sx. cnt. (Est. cnt. top @ 1,529')

NOTE: No log available. A 4 1/2" OD. liner
will be set and cemented over open
hole section. The Grayburg and San
Andres formations will be perforated
in selected intervals. Injection in-
to the selected intervals will be sep-
arated by using bottom hole flow reg-
ulators and packers on one string of
2 3/8" OD. tubing.

Exhibit "C-3" Case 4926

SHEWANDOH OIL CORPORATION

DIAGRAMATIC SKETCH OF INJECTION WELL

Lease: F. M. Robinson A

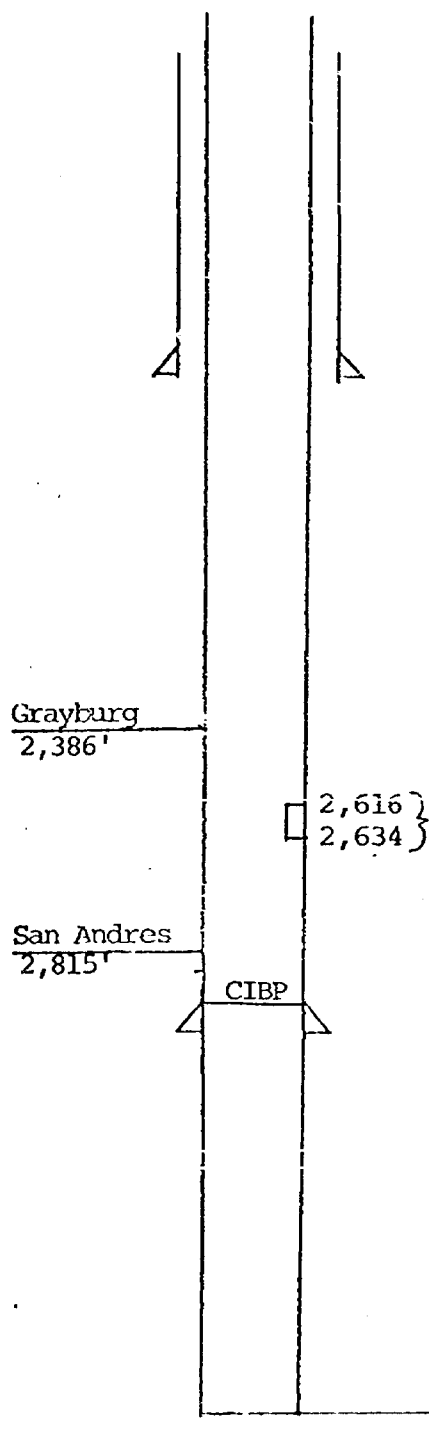
Well No. 11

Location: Unit E, 1,980 ft. FNL & 660 ft.

FWL, Sec. 35, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,539'



8 1/4 in. csg. @ 450 ft.
with 50 sx. cmt. (Est. cmt. top @ 150')

Present perf.

7 in. csg. @ 3,034 ft.
with 100 sx. cmt. (Est. cmt. top @ 1,734')

NOTE: A 4 1/2" OD. liner will be set and cemented over open hole section. The Grayburg and San Andres formations will be perforated in selected intervals. Injection into the selected intervals will be separated by using bottom hole flow regulators and packers on one string of 2 3/8" OD. tubing.

Exhibit "C-4"

Case 4926

SHENANDOAH OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson A

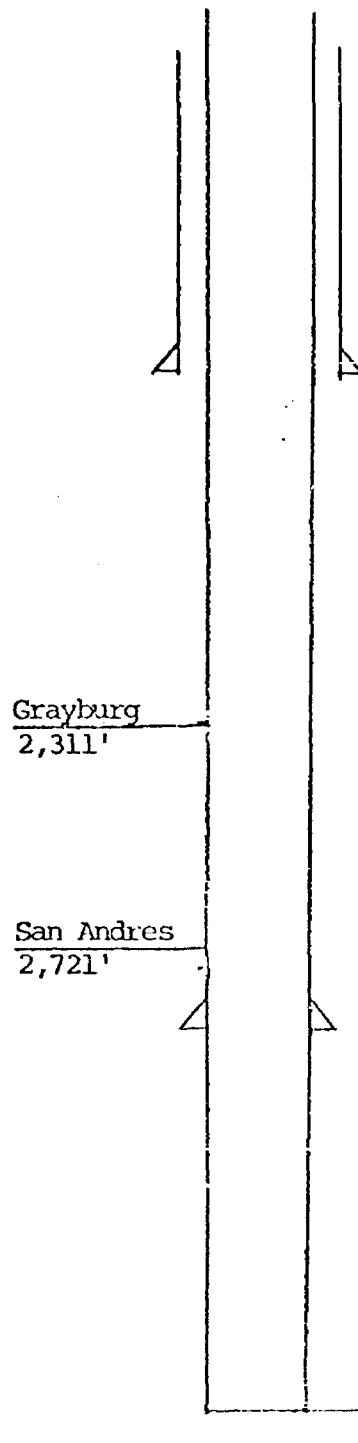
Well No. 12

Location: Unit A, 660 ft. FNL & 654 ft.

FEL, Sec. 34, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,558'



8 1/4 in. csg. @ 430 ft.
with 50 sx. cmt. (Est. cmt. top @ 130!)

7 in. csg. @ 2,921 ft.
with 100 sx. cmt. (Est. cmt. top @ 1,621')

NOTE: No log available. A 4 1/2" OD. liner
will be set and cemented over open
hole section. The Grayburg and San
Andres formations will be perforated in
in selected intervals. Injection in-
to the selected intervals will be sep-
arated by using bottom hole flow reg-
ulators and packers on one string of
2 3/8" OD. tubing.

Case H 926

Exhibit "C-5"

SHEWANDOH OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson B

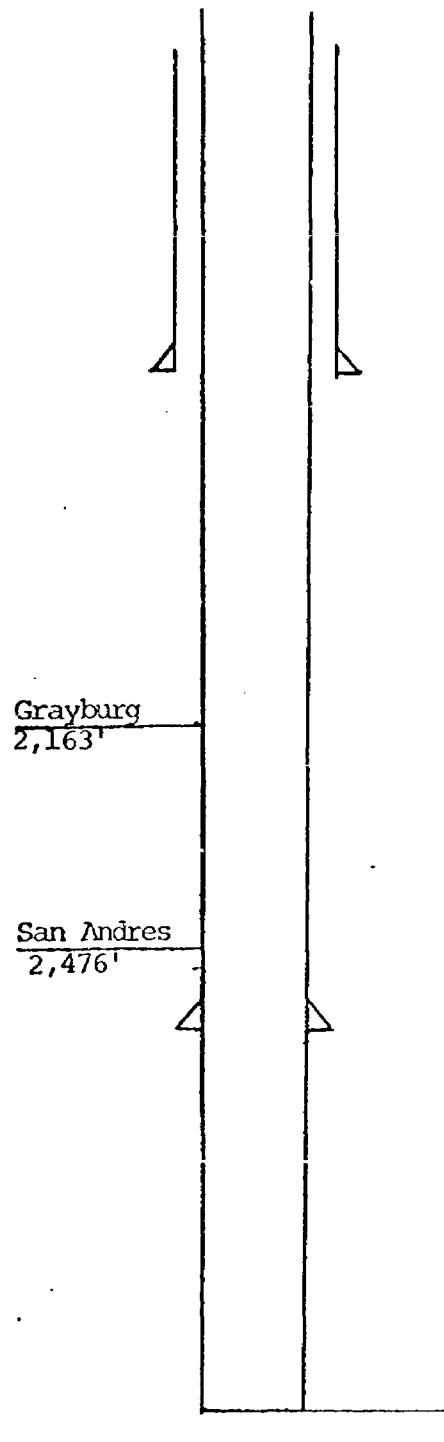
Well No. 1

Location: Unit A, 660 ft. ENL & 660 ft.

FEL, Sec. 27, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,566'



8 1/4 in. csg. @ 982 ft.
with 100sx. cnt. (Est. cnt. top @ 382')

7 in. csg. @ 2,305 ft.
with 100sx. cnt. (Est. cnt. top @ 1,005')

NOTE: A 4 1/2" OD. liner will be set and
cemented over open hole section.
The Grayburg and San Andres forma-
tions will be perforated in se-
lected intervals. Injection into
the selected intervals will be
separated by using bottom hole
flow regulators and packers on
one string of 2 3/8" OD. tubing.
No log available.

TD
2,793'

Case 4926

Exhibit "C-6"

SHENANDOAH OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson B

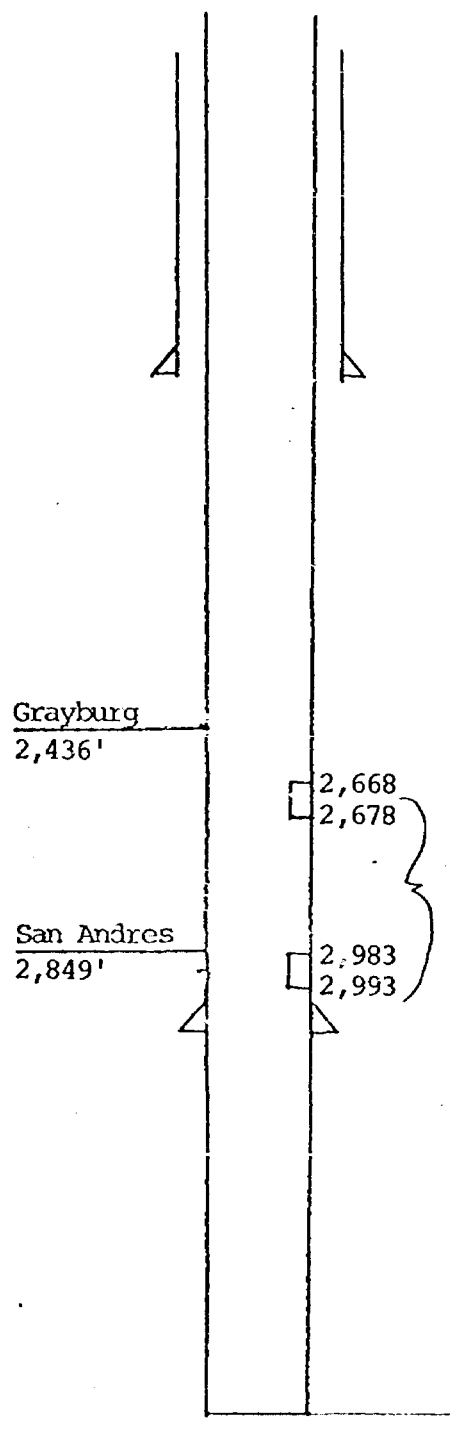
Well No. 4

Location: Unit A, 660 ft. FEL & 660 ft.

FNL, Sec. 35, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,563'



8 5/8 in. csg. @ 428 ft.
with 50 sx. cmt. (Est. cmt. top @ 128')

Present perf.

7 in. csg. @ 3,050 ft.
with 100 sx. cmt. (Est. cmt. top @ 1,750')

NOTE: A 4 1/2" OD. liner will be set and
cemented over open hole section.
The Grayburg and San Andres form-
ations will be perforated in selected
intervals. Injection into the se-
lected intervals will be separated
by using bottom hole flow regulators
and packers on one string of 2 3/8"
OD. tubing.

TD
3,191'

Case 4926

Exhibit "C-7"

SHEVANDOAH OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson B

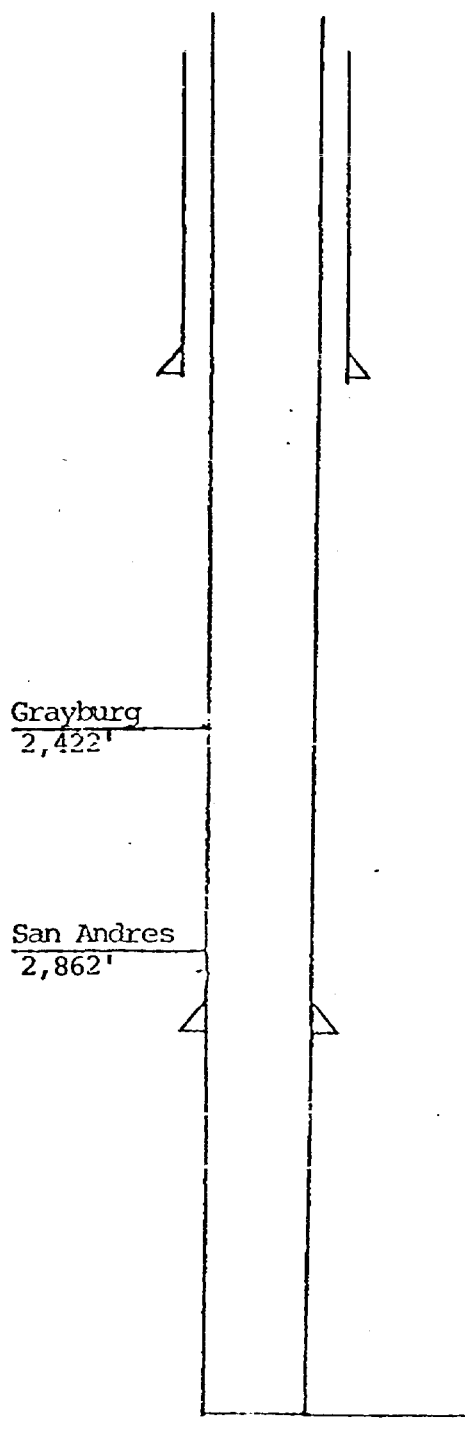
Well No. 6

Location: Unit G, 1,980 ft. FNL & 1,980 ft.

FEL, Sec. 35, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,563'



8 5/8 in. csg. @ 465 ft.
with 50 sx. cmt. (Est. cmt. top @ 265')

7 in. csg. @ 3,055 ft.
with 100 sx. cmt. (Est. cmt. top @ 1,755')

NOTE: No log available. A 4 1/2" OD. liner
will be set and cemented over open
hole section. The Grayburg and San
Andres formations will be perforated
in selected intervals. Injection in-
to the selected intervals will be sep-
arated by using bottom hole flow reg-
ulators and packers on one string of
2 3/8" OD. tubing.

Case H926

Exhibit "C-8"

SHEVANDONH OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson B

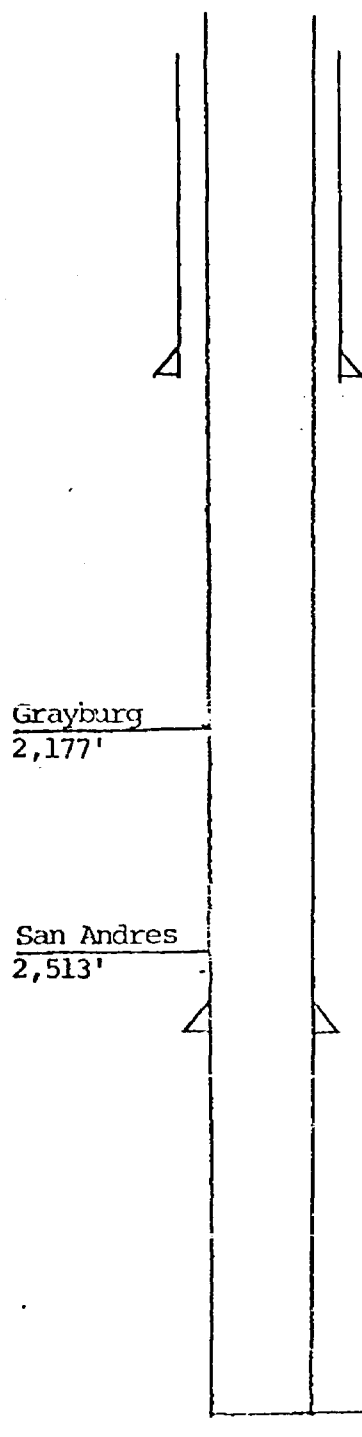
Well No. 8

Location: Unit K, 1,980 ft. FWL & 1,980 ft.

FSL, Sec. 27, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,526'



8 1/4 in. csg. @ 305 ft.
with 50 sx. cmt. (Est. cmt. top @ 5')

7 in. csg. @ 2,690 ft.
with 100 sx. cmt. (Est. cmt. top @ 1,390')

NOTE: Used adjacent well log B-32 for correlation. A 4 1/2 OD. liner will be set and cemented over open hole section. The Grayburg and San Andres formations will be perforated in selected intervals. Injection into the selected intervals will be separated by using bottom hole flow regulators and packers on one string of 2 3/8" OD. tubing.

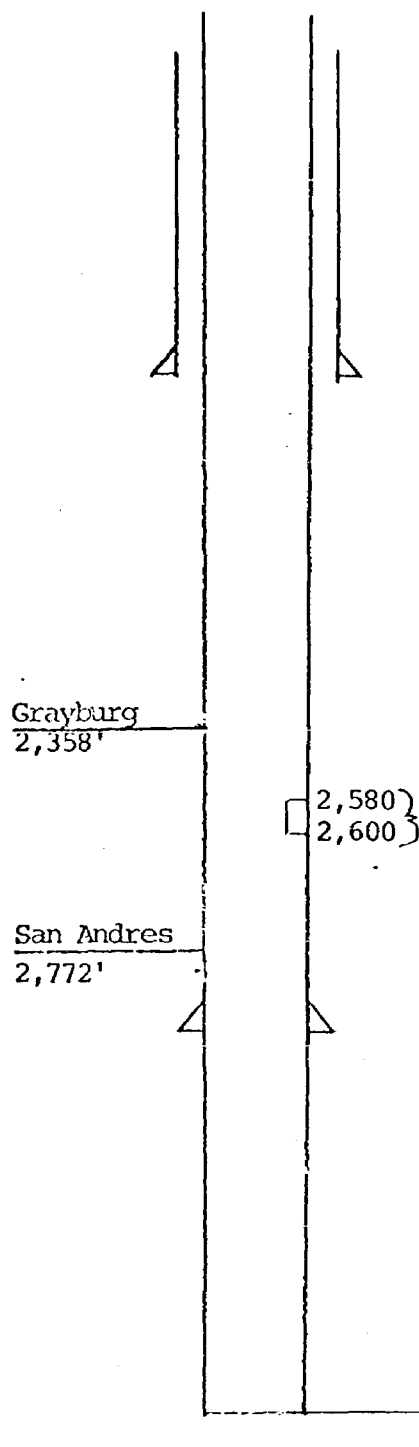
Case 4926

Exhibit "C-9"

SHEWNDON OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson B
Well No. 11
Location: Unit C, 660 ft. ENL & 1,980 ft.
FWL, Sec. 35, T-17S, R-29E
Eddy County, New Mexico
Elevation: 3,550'



8 1/4 in. csg. @ 526 ft.
with 50 sx. cmt. (Est. cmt. top @ 226!)

Present perf.

7 in. csg. @ 2,980 ft.
with 100 sx. cmt. (Est. cmt. top @ 1,680')

NOTE: A 4 1/2" OD. liner will be set and
cemented over open hole section.
The Grayburg and San Andres form-
ations will be perforated in selected
intervals. Injection into the se-
lected intervals will be separated
by using bottom hole flow regulators
and packers on one string of 2 3/8"
OD. tubing.

Case 4926

Exhibit "C-10"

SHEWANDOH OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson B

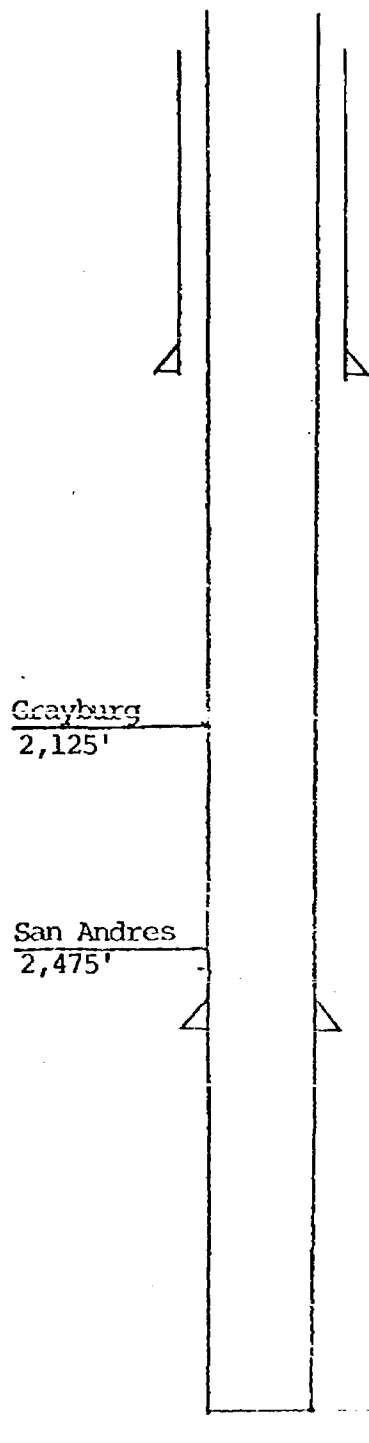
Well No. 15

Location: Unit G, 1,980 ft. FNL & 1,980 ft.

FEL, Sec. 27, T-17S. R-29E

Eddy County, New Mexico

Elevation: 3,548'



8 1/4 in. csg. @ 335 ft.
with 50 sx. cnt. (Est. cnt. top @ 35'.)

7 in. csg. @ 2,661 ft.
with 100 sx. cnt. (Est. cnt. top @ 1,361')

NOTE: No log available. A 4 1/2" OD. liner
will be set and cemented over open
hole section. The Grayburg and San
Andres formations will be perforated
in selected intervals. Injection in-
to the selected intervals will be sep-
arated by using bottom hole flow reg-
ulators and packers on one string of
2 3/8" OD. tubing.

Case 4926

Exhibit "C-11"

SHEVANDON OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson B

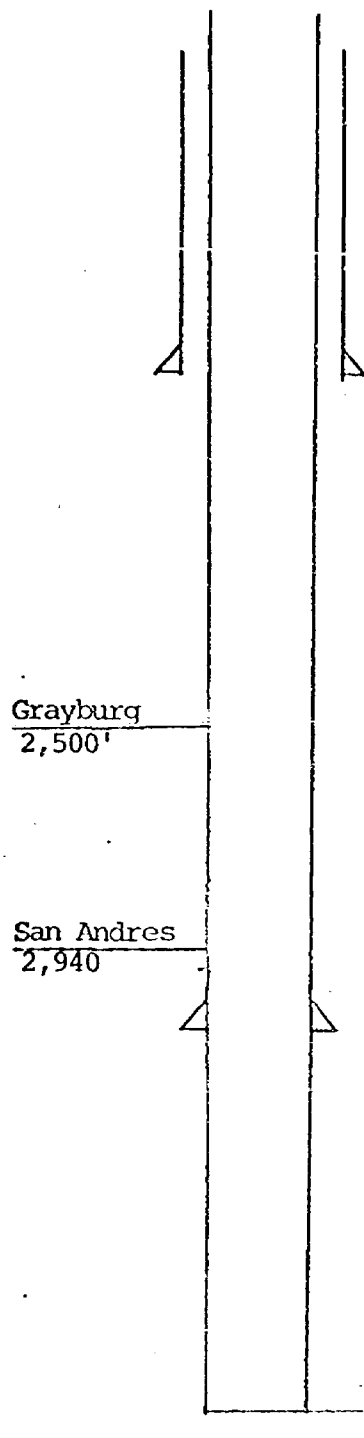
Well No. 16

Location: Unit I, 1,980 ft. FSL & 660 ft.

FEL, Sec. 35, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,552'



8 1/4 in. csg. @ 505 ft.
with 50 sx. cmt. (Est. cmt. top @ 205')

7 in. csg. @ 3,157 ft.
with 100 sx. cmt. (Est. cmt. top @ 1,857')

NOTE: A 4 1/2" OD. liner will be set and
cemented over open hole section.
The Grayburg and San Andres forma-
tions will be perforated in selected
intervals. Injection into the se-
lected intervals will be separated
by using bottom hole flow regulators
and packers on one string of 2 3/8"
OD tubing.

Check 4926

Exhibit "C-12"

SHEWANDOH OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson B

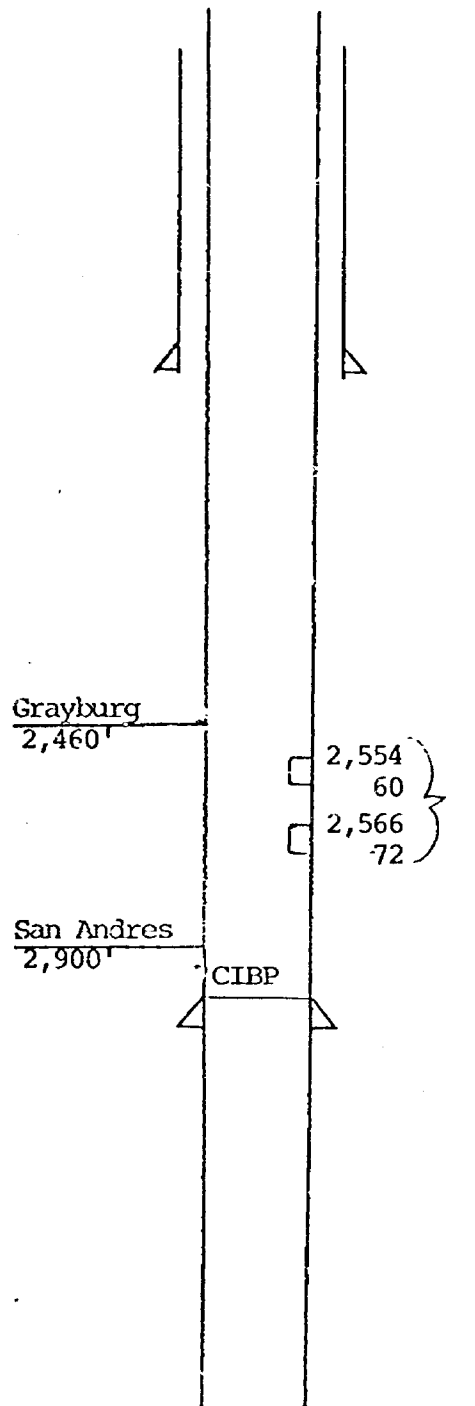
Well No. 17

Location: Unit K, 1,980 ft. FSL & 1,980 ft.

FWL, Sec. 35, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,542'



8 1/4 in. csg. @ 492ft.
with 50 sx. cnt. (Est. cnt. top @ 292')

Present perf.

7 in. csg. @ 3,165 ft.
with 100 sx. cnt. (Est. cnt. top @ 1,865')

NOTE: A 4 1/2" OD. liner will be set and
cemented over open hole section.
The Grayburg and San Andres forma-
tions will be perforated in selected
intervals. Injection into the se-
lected intervals will be separated
by using bottom hole flow regulators
and packers on one string of 2 3/8"
OD tubing.

TD 3,265'

Case 4926

Exhibit "C-13"

SHENANDOAH OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson "B"

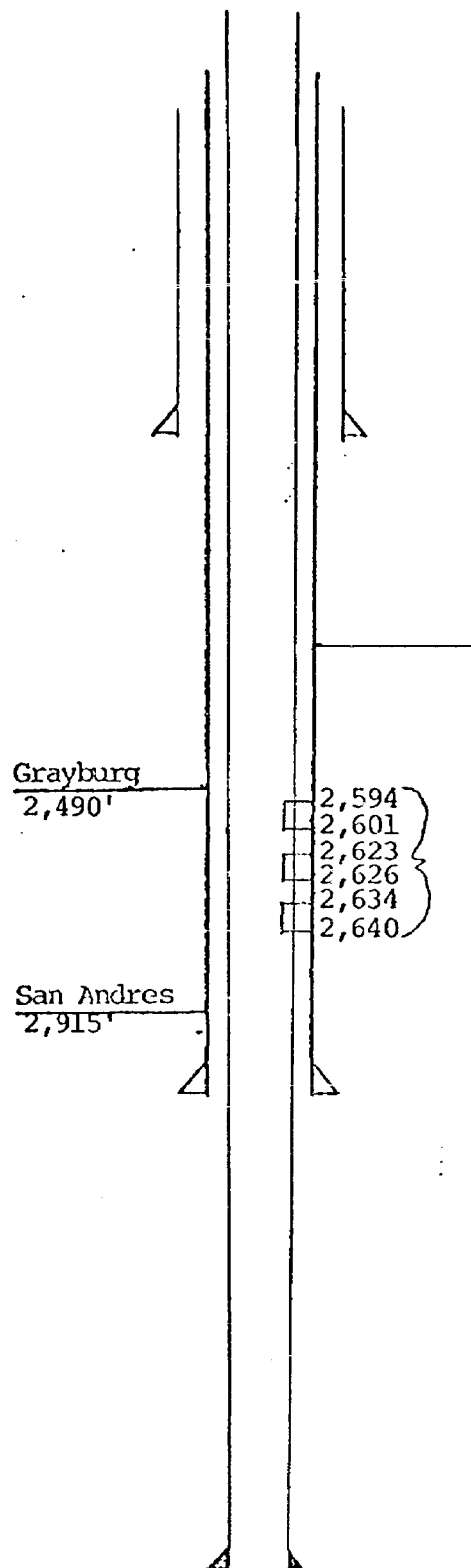
Well No. 18

Location: Unit O, 660 ft. FSL & 1,980 ft.

FEL, Sec. 35, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,537'



8 1/4 in. csg. @ 509 ft.
with 500 sx. cnt. (Est. cnt. top @ 209\')

1,920' 7" pulled 5/23/47

Present Perf.

7 in. csg. @ 3,152 ft.
with 100 sx. cnt. (Est. cnt. top @ 1,852')

NOTE: The Grayburg and San Andres formations
will be perforated in selected intervals.
Injection into the selected intervals
will be separated by using bottom hole
flow regulators and packers on one string
of 2 3/8" OD. tbg.

Case 4926

4 1/2 in. csg. @ 3,325 ft.
with 585 sx. cnt. (Cnt. circ. to surf.)

Exhibit "C-14"

SHEWANDOAH OIL CORPORATION

DIAGRAMATIC SKETCH OF
INJECTION WELL

Lease: F. M. Robinson B

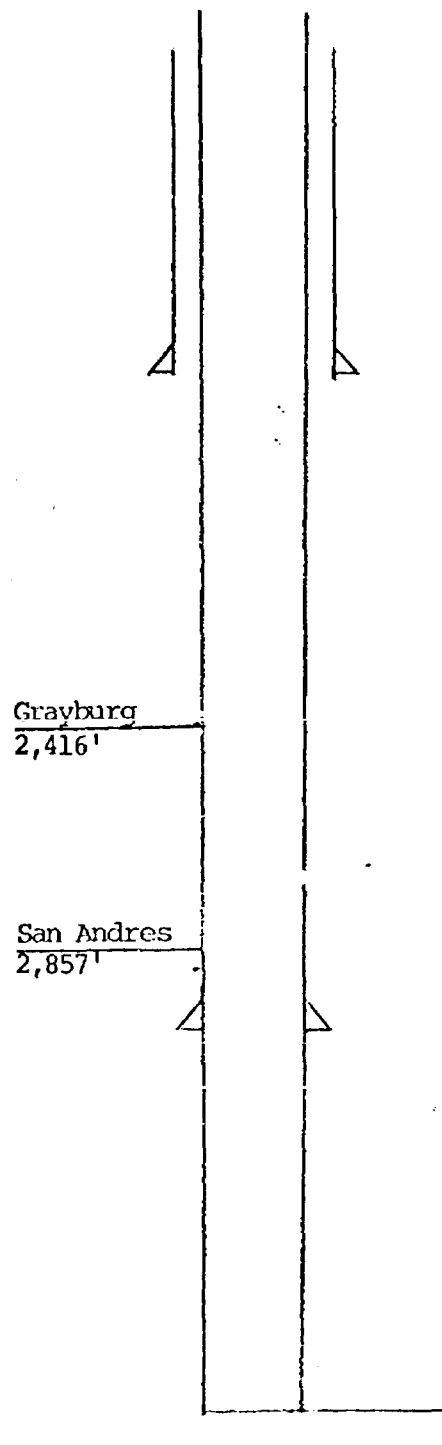
Well No. 19

Location: Unit I, 1,980 ft. FSL & 660 ft.

FEL, Sec. 34, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,534'



8 1/4 in. csg. @ 360 ft.
with 50 sx. cmt. (Est. cmt. top @ 60')

7 in. csg. @ 3,076 ft.
with 100 sx. cmt. (Est. cmt. top @ 1,776')

NOTE: A 4 1/2" OD. liner will be set and
cemented over open hole section.
The Grayburg and San Andres forma-
tions will be perforated in se-
lected intervals. Injection into
the selected intervals will be
separated by using bottom hole
flow regulators and packers on
one string of 2 3/8" OD. tubing.

TD
3,234'

Case 4926

Exhibit "C-15"

SHENANDOAH OIL CORPORATION

DIAGRAMATIC SKETCH OF INJECTION WELL

Lease: F. M. Robinson B

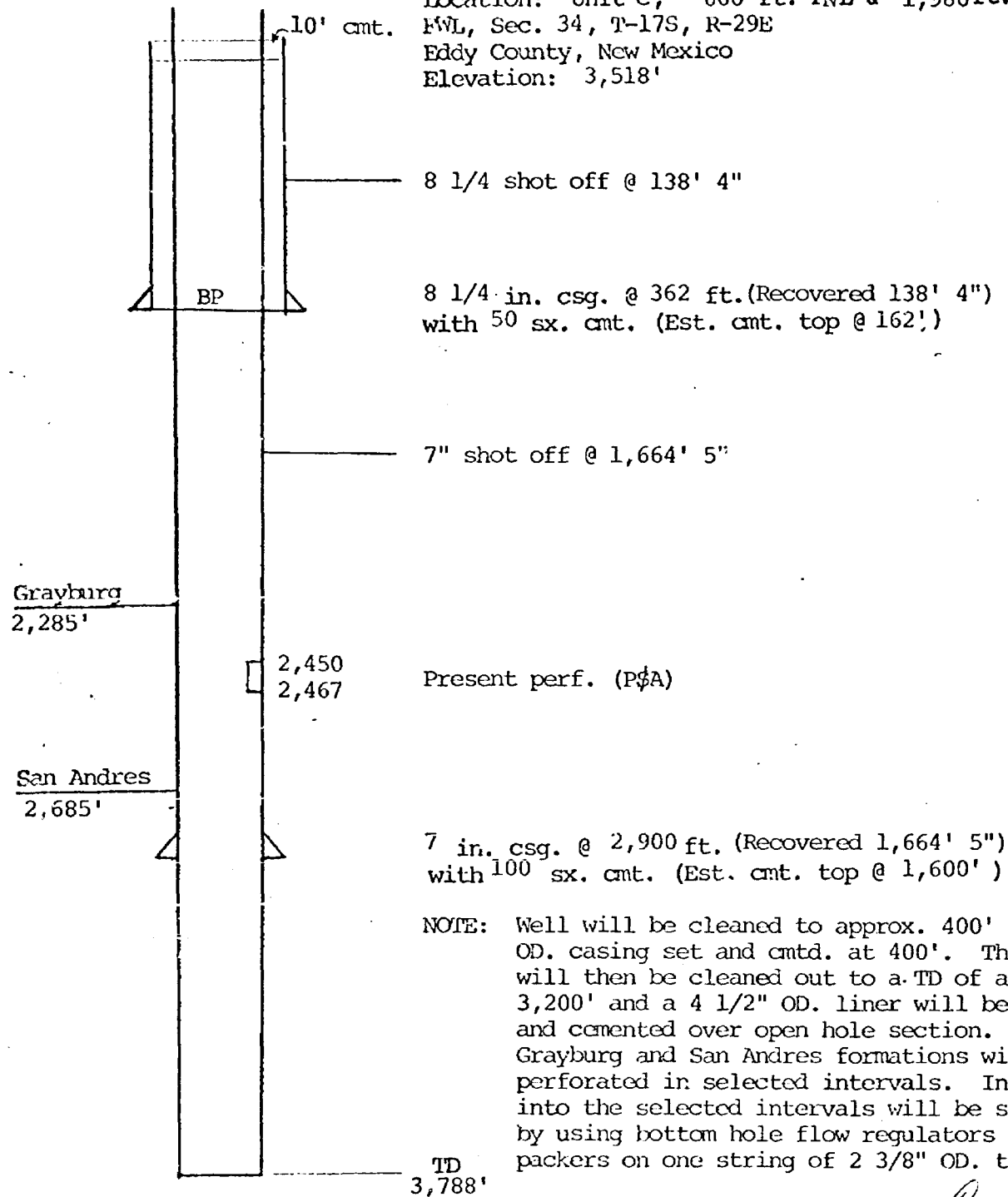
Well No. 20

Location: Unit C, 660 ft. FNL & 1,980 ft.

FWL, Sec. 34, T-17S, R-29E

Eddy County, New Mexico

Elevation: 3,518'



Case 4926

Exhibit "C-16"

SHEVANDOH OIL CORPORATION

DIAGRAMATIC SKETCH OF TYPICAL INJECTION WELL

Robinson - Jackson Unit
Sections 27, 34, 35, T-17-S, R-29-E
Eddy County, New Mexico

PROPOSED CONDITIONS

1. 1 string of 2 3/8" OD. tbg. Internally plastic coated will be used.
2. The 2 3/8" x 7" annulus will be loaded with an inert fluid and a pres. gauge will be used to monitor any pres. increases.
3. All pkrs. and down hole flow regulators will be internally and externally plastic coated.

PRESENT CONDITIONS

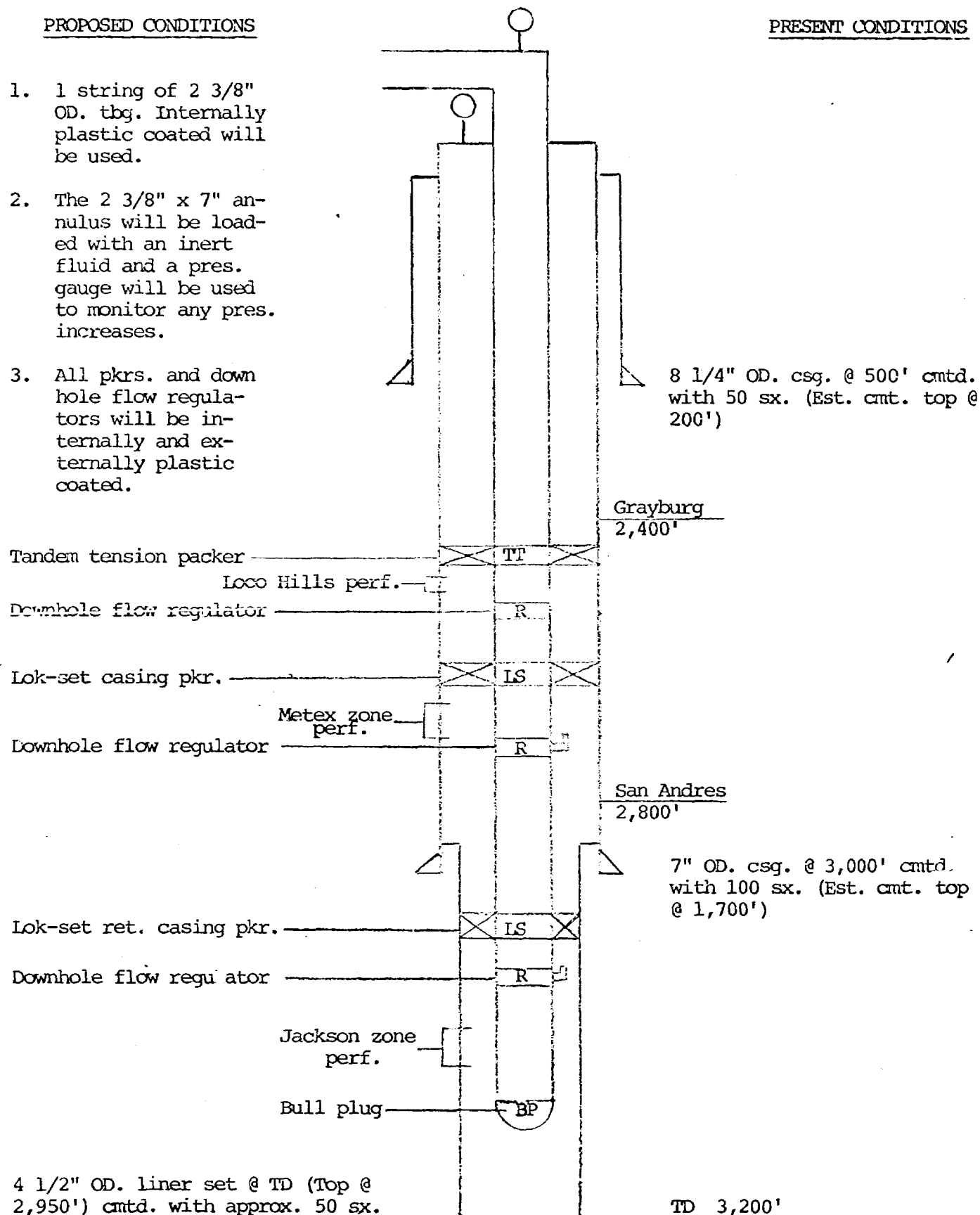


Exhibit "D" Case 4926

DRAFT

dr/

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. 4926

Order No. R-4502

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

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on March 28, 1933,
at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this day of April, 1933, 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, Shenandoah Oil Corporation,
seeks authority to institute a waterflood project in the Robinson-
Jackson Unit Area, Grayburg-Jackson Pool,
by the injection of water into the Grayburg ^{and the} San Andres formations
through 16 injection wells in Sections 27, 34 and 35,
Township 17 ~~XXXX~~, South, Range 29 ~~XXXX~~, East,
NMPM, Eddy County, New Mexico.

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

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

(5) That the subject application should be approved and the project should be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

IT IS THEREFORE ORDERED:

(1) That the applicant, Shenandoah Oil Corporation, is hereby authorized to institute a waterflood project in the Robinson-Jackson Unit Area, Grayburg-Jackson Pool, by the injection of water into the Grayburg ^{and the} San Andres formations through the following-described wells in Township 17 ~~XXXXX~~ North, South, Range 29 ~~West~~, East, NMPM, Eddy County, New Mexico:

insert attached list of wells here.

(2) That injection ^{into each well} shall be through plastic coated tubing ~~with the set in a packer~~; that the casing tubing annulus shall be loaded with an inert fluid and equipped with a pressure gauge at the surface.

(3) That the subject waterflood project is hereby designated the Robinson - Jackson Waterflood Project and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

(4) That monthly progress reports of the waterflood project herein authorized shall be submitted to the Commission in accordance with Rules 704 and 1120 of the Commission Rules and Regulations.

(5) 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.

<u>Date</u>	<u>Name</u>	<u>Unit</u>	<u>Index</u>
	F.M. Robinson "A" Well No. 1	G	34
	F.M. Robinson "A" Well No. 7	T.	37
	F.M. Robinson "A" Well No. 1	O	27
	F.M. Robinson "A" Well No. 11	I.	35
	F.M. Robinson "A" Well No. 12	I.	34
	F.M. Robinson "B" Well No. 1	I.	27
	F.M. Robinson "B" Well No. 4	A	35
	F.M. Robinson "B" Well No. 6	G	35
	F.M. Robinson "B" Well No. 8	K	27
	F.M. Robinson "B" Well No. 11	C	35
	F.M. Robinson "B" Well No. 15	G	27
	F.M. Robinson "B" Well No. 16	I	35
	F.M. Robinson "B" Well No. 17	K	35
	F.M. Robinson "B" Well No. 18	O	35
	F.M. Robinson "B" Well No. 19	I	34
	F.M. Robinson "B" Well No. 20	C	34