

**CASE 3824: Appli. of ATLANTIC
RICHFIELD CO. FOR A WATERFLOOD
PROJECT, EDDY COUNTY, N. MEX.**

Case Number

3824

Application
Transcripts.

Small Exhibits

ETC.

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE No. 3824
Order No. R-3469

APPLICATION OF ATLANTIC RICHFIELD COMPANY
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 August 7, 1968, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 13th day of August, 1968, 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, Atlantic Richfield Company, seeks permission to institute a waterflood project in its West Red Lake Unit Area, Red Lake Queen-Grayburg-San Andres Pool, by the injection of water into the Premier zone of the Grayburg formation and the San Andres formation through 15 injection wells in Sections 4, 5, 7, 8, and 9, Township 18 South, Range 27 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, Atlantic Richfield Company, is hereby authorized to institute a waterflood project in its West Red Lake Unit Area, Red Lake Queen-Grayburg-San Andres Pool, by the injection of

-2-

CASE No. 3824
Order No. R-3469

water into the Premier zone of the Grayburg formation and the San Andres formation through the following-described wells in Township 18 South, Range 27 East, NMPM, Eddy County, New Mexico:

Well	Well No.	Unit	Section
West Red Lake Unit	29	K	4
West Red Lake Unit	17	M	5
West Red Lake Unit	24	P	5
West Red Lake Unit	2	D	7
West Red Lake Unit	4	F	7
West Red Lake Unit	11	O	7
West Red Lake Unit	13	R	7
West Red Lake Unit	14	H	7
West Red Lake Unit	16	I	7
West Red Lake Unit	21	B	8
West Red Lake Unit	26	I	8
West Red Lake Unit	28	D	9
West Red Lake Unit	31	C	9

(2) That the subject waterflood project is hereby designated the Atlantic Richfield West Red Lake Waterflood Project and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

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

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

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION


DAVID F. CARCO, Chairman

GUYTON B. HAYS, Member

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

esr/

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

September 17, 1968

C
O
P
Y

Mr. Clarence Hinkle
Hinkle, Bondurant & Christy
Attorneys at Law
Post Office Box 10
Roswell, New Mexico 88201

Dear Sir:

Reference is made to Commission Order No. R-3469, recently entered in Case No. 3824, approving the Atlantic Richfield West Red Lake Waterflood Project.

Injection is to be through the 13 authorized water injection wells, each of which shall be equipped with tubing and a packer with dual injection down the annulus into the Premier zone of the Grayburg formation and down the tubing into the San Andres formation. It is our understanding that after a trial period the injection streams into the two zones will be combined through tubing if injection rates and pressures are compatible. It is our further understanding that the majority of the wells have surface casing set to the top of the Premier pay or near thereto, while some of the wells have either no surface casing or only a limited amount thereof. The period for injection down the annulus is therefore limited to six months in the Brainard Well No. 4, the Simon Federal "A" Well No. 1, and the Mann Federal Well No. 2 (Unit Wells Nos. 24, 17, and 31, respectively).

As to allowable, our calculations indicate that when all of the authorized injection wells have been placed on active injection, the maximum allowable which this project will be eligible to receive under the provisions of Rule 701-E-3 is 1190 barrels per day when the Southeast New Mexico normal unit allowable is 42 barrels per day or less, provided that the four extra wells on Units A and B of Section

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

-2-

Mr. Clarence Hinkle
Hinkle, Bondurant & Christy
Attorneys at Law
Roswell, New Mexico

September 17, 1968

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8 and Units H and J of Section 7 are placed or remain on production. Otherwise the maximum allowable, based on 13 injection 40's and 14 production 40's, would be 1134 barrels per day.

Please report any error in this calculated maximum allowable immediately, both to the Santa Fe office of the Commission and the appropriate district proration office.

In order that the allowable assigned to the project may be kept current, and in order that the operator may fully benefit from the allowable provisions of Rule 701, it behooves him to promptly notify both of the aforementioned Commission offices by letter of any change in the status of wells in the project area, i.e., when active injection commences, when additional injection or producing wells are drilled, when additional wells are acquired through purchase or unitization, when wells have received a response to water injection, etc.

Your cooperation in keeping the Commission so informed as to the status of the project and the wells therein will be appreciated.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ALP/DSH/ir

cc: Oil Conservation Commission Offices in Hobbs and Artesia, N.M.
Mr. D. E. Gray, State Engineer Office, Santa Fe, New Mexico

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

APPLICATION OF ATLANTIC RICHFIELD
COMPANY FOR APPROVAL OF A WATER FLOOD
PROJECT FOR THE WEST RED LAKE UNIT
AREA COMPRISING 1,237 ACRES, MORE OR
LESS, OF FEDERAL AND FEE LANDS IN
TOWNSHIP 18 SOUTH, RANGE 27 EAST,
N.M.P.M. BY THE INJECTION OF WATER
INTO 13 WELLS COMPLETED, IN THE RED
LAKE QUEEN - GRAYBURG - SAN ANDRES
POOL

Case 3824

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Oil Conservation Commission
Box 2088
Santa Fe, New Mexico 87501

Comes Atlantic Richfield Company, acting by and through the undersigned attorneys, and hereby makes application for approval of a water flood project for the West Red Lake Unit Area comprising 1,237 acres, more or less, of federal and fee lands in Township 18 South, Range 27 East, N.M.P.M. by the injection of water into 13 wells completed in the Red Lake Queen - Grayburg - San Andres Pool, Eddy County, New Mexico, and in support thereof respectfully shows:

1. That applicant is the unit operator of the West Red Lake Unit Agreement heretofore approved by the Commission and which comprises 1,237 acres of federal and fee lands in Township 18 South, Range 27 East, N.M.P.M. Eddy County.

2. That applicant seeks approval of a secondary recovery project covering all of the lands within the West Red Lake Unit Area by the injection of water into 13 wells heretofore completed in the Red Lake Queen - Grayburg - San Andres Pool, said wells, all located in Township 18 South, Range 27 East, being as follows:

W.R. S. # 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
1. Mann Federal No. 1 located 990 feet from the north line and 330 feet from the west line of Section 9. D

W.R. S. # 26
2. Vandagriff "A" Federal No. 1 located 2340 feet from the south line and 400 feet from the east line of Section 8. I

3. Vandagriff "C" No. 2 located 1650 feet from the north line and 330 feet from the east line of Section 7. ^{#14 ✓} H -
4. Mann Federal No. 2 located 660 feet from the north line and 1980 feet from the west line of Section 9. ^{#31 ✓} C -
5. Sterling No. 4 located 1650 feet from the west line and 2310 feet from the north line of Section 7. ^{#14 ✓} E -
6. Vandagriff "C" No. 3 located 330 feet from the north line and 990 feet from the east line of Section 7. ^{#13 ✓} A -
7. Federal "EG" No. 1 located 1592 feet from the south line and 2302 feet from the west line of Section 4. ^{#29 ✓} K -
8. Gant Federal No. 2 located 2240 feet from the south line and 400 feet from the east line of Section 7. ^{#16 ✓} I -
9. Sterling No. 2 located 330 feet from the north line and 990 feet from the west line of Section 7. ^{#1 ✓} D -
10. Picher Federal No. 5 located 990 feet from the north line and 2310 feet from the east line of Section 8. ^{#11 ✓} B -
11. Kaiser No. 4 located 1980 feet from the east line and 990 feet from the south line of Section 7. ^{#17 ✓} O -
12. Simon Federal "A" No. 1 located 990 feet from the south line and 330 feet from the west line of Section 5. ^{#24 ✓} M -
13. Brainard No. 4 located 990 feet from the south line and 660 feet from the east line of Section 5. ^{#24 ✓} P -

3. That there is attached hereto a plat showing the location of the proposed injection wells and the location of all other wells within a radius of 2 miles from said proposed injection wells and the formation from which said wells are producing or have produced. The plat also indicates the lease owners within a radius of 2 miles.

4. That there is also filed herewith logs of 7 of the proposed injection wells. The logs of the other 6 wells are not filed due to the fact that the logs are not available as these wells have been completed for a considerable length of time.

5. There is also filed herewith a diagrammatic sketch of each of the proposed injection wells showing all casing strings, including diameters and setting depths, quantities used and tops of cement, perforated or open hole intervals, tubing strings, including diameters and setting depths, and packers which will be used.

6. That applicant seeks to have assigned to the West Red Lake Unit Area the maximum project allowable in accordance with Rule 701 of the Commission.

7. Applicant believes that the proposed water flood project for the West Red Lake Unit Area is in the interest of conservation and the prevention of waste and will promote the greatest ultimate recovery of oil and gas from the project area.

8. A copy of this application, together with a copy of the plat, logs, and diagrammatic sketches, are being furnished to the office of the State Engineer, Capitol Building, Santa Fe, in accordance with the provisions of Rule 701.

Applicant requests that this matter be set down for hearing at the examiner's hearing to be held on August 7.

Respectfully submitted,

ATLANTIC RICHFIELD COMPANY

By 

Member of the Firm of
HINKLE, BONDURANT & CHRISTY
Attorneys for Applicant
Box 10
Roswell, New Mexico

Cases 3824

Heard 9-9-68

Per. 8-8-68.

Grant Atlantic Richfield permission
to convert 13 Red Lake-Queen,
Grayburg - San Andreas wells to
injection wells. Injection shall
be dual into (Premier) Grayburg
in annulus and San Andreas
then tubing under a packer.

Provide Admin. approval to
convert injection wells to single
injection into both zones under
a packer if at a later date
it appears feasible.

The 13 wells will be known as
W. Red Lake unit # ?. The
list of well #'s are attached.

Thos. H. J.

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. 3653
Order No. R-3311

APPLICATION OF DEPCO, INC.,
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 September 6, 1967,
at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 11th day of September, 1967, the Commission, a
quorum being present, having considered the testimony, the record,
and the recommendations of the Examiner, and being fully advised
in the premises,

FINDS:

(1) That due public notice having been given as required by
law, the Commission has jurisdiction of this cause and the subject
matter thereof.

(2) That the applicant, Depco, Inc., as successor to Inter-
national Oil and Gas Corporation, operates a waterflood project
in the Artesia Pool pursuant to Order No. R-2876, dated March 5,
1965, by the injection of water into the Grayburg formation
through two wells located in Sections 25 and 36, Township 17
South, Range 28 East.

(3) That the applicant seeks permission to expand said
waterflood project in its Artesia Unit Area, Artesia Pool, by
the injection of water into the Grayburg formation through 15
additional injection wells in Sections 26, 34, 35, and 36,
Township 17 South, Range 28 East, and Sections 2 and 3, Township
18 South, Range 28 East, NMPM, Eddy County, New Mexico.

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

CASE No. 3653
Order No. R-3311

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

(6) 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, Depco, Inc., is hereby authorized to expand its Highway Waterflood Project in its Artesia Unit Area, Artesia Pool, by the injection of water into the Grayburg formation through the following-described wells in Eddy County, New Mexico:

OPERATOR	LEASE	WELL NO.	UNIT	SECTION	TOWNSHIP	RANGE
NMPM						
Depco	State 647	164	M	26	17 South	28 East
Depco	State 647	169	O	26	17 South	28 East
Depco	Delhi State	1	O	34	17 South	28 East
Depco	Welch State	2	E	35	17 South	28 East
Depco	MRY State	2	G	35	17 South	28 East
Depco	Sinclair B State	1	M	35	17 South	28 East
Depco	Castle State	2	O	35	17 South	28 East
Depco	State 647	139	E	36	17 South	28 East
Depco	Sinclair B State	2	M	36	17 South	28 East
Depco	State A	2	E	2	18 South	28 East
Depco	Featherstone State B	7	M	2	18 South	28 East
Depco	Lanning State	1	E	3	18 South	28 East
Depco	State 647	130	G	3	18 South	28 East
Depco	State 647	38	M	3	18 South	28 East
Depco	Kesler State	2	O	3	18 South	28 East

(2) That the subject waterflood project is hereby redesignated the Depco Artesia Waterflood Project and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

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

-3-

CASE No. 3653
Order No. R-3311

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

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

DAVID F. CARGO, Chairman

GUYTON B. HAYS, Member

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

S E A L

esr/

GOVERNOR
DAVID F. CARGO
CHAIRMAN

State of New Mexico
Oil Conservation Commission



LAND COMMISSIONER
GUYTON B. HAYS
MEMBER

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

P. O. BOX 2088
SANTA FE

August 13, 1968

Mr. Clarence Hinkle
Hinkle, Bondurant & Christy
Attorneys at Law
Post Office Box 10
Roswell, New Mexico 88201

Re: Case No. 3824

Order No. R-3469

Applicant:

Atlantic Richfield Company

Dear Sir:

Enclosed herewith is a copy of the above-referenced Commission order recently entered in the subject case. Letter pertaining to conditions of approval and maximum allowable to follow.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

Carbon copy of order also sent to:

Hobbs OCC x
Artesia OCC x
Aztec OCC
State Engineer x

Other

dearnley-meier reporting service, inc.

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

1120 SIMAS BLDG. • P. O. BOX 1092 • PHONE 243-4491 • ALBUQUERQUE, NEW MEXICO

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
August 7, 1968

EXAMINER HEARING

IN THE MATTER OF:

Application of Atlantic Richfield
Company for a waterflood project, Eddy
County, New Mexico.

Case No. 3824

BEFORE: Elvis A. Utz, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: Case 3824.

MR. HATCH: Case 3824. Application of Atlantic Richfield Company for a waterflood project, Eddy County, New Mexico.

MR. HINKLE: Mr. Examiner, Clarence Hinkle, Hinkle, Bondurant and Christy, Roswell, appearing on behalf of the Atlantic Richfield. We have one witness, Mr. Jerry Tweed who was also a witness in the previous case and has been sworn.

MR. UTZ: Let the record show that the same witness has been sworn in the previous case. Are there any other appearances? You may proceed.

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

J E R R Y L. T W E E D, called as a witness, having been previously duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HINKLE:

Q State your name, by whom you are employed and where you reside?

A Jerry Tweed, and I am employed by Atlantic Richfield Company in Roswell, New Mexico.

Q What is your position with Atlantic Richfield?

A I am Petroleum Engineer.

Q Have you previously testified before the Oil

Conservation Commission?

A Yes, sir, I have.

Q And your qualifications as a Petroleum Engineer are a matter of record with the Commission?

A Yes.

Q Are you familiar with the application of Atlantic Richfield in this case, 3824?

A Yes, I am.

Q What is Atlantic Richfield seeking to accomplish by this application?

A We are making application to instigate waterflood operations on our West Red Lake unit, by the conversion of 13 wells to inject it from the Premier-San Andres formations.

Q Has the ~~West~~ Red Lake unit agreement been previously approved by the Oil Conservation Commission?

A Yes, sir, it has.

Q And this application is to make the waterflood co-extensive with the unit area?

A That is right.

Q All of the lands, I believe, that are involved in the unit area are Federal lands, is that right?

A Federal and fee lands.

Q Some fee lands, too?

A There are some fee lands. The unit consists of some

1236.85 acres, I think, a little over 900 of which are Federal land and the rest of which are fee land.

Q Have you prepared or has there been prepared under your direction certain exhibits to be introduced in this case?

A Yes, there have.

Q Refer to Atlantic Richfield Exhibit Number 1 and explain what it shows?

A This is a plat map of a portion of the Red Lake Pool. Shown here is our West Red Lake unit, outlined in red, the cross-section locations, the west to east cross sections and the south to north. Also in blue triangles are the injection wells that we plan to convert, the wells that we plan to convert to injection.

Q This also shows the ownership of all the leasehold interests in the unit?

A Yes. It shows the ownership and producing horizons for the wells.

Q And all the wells that have been drilled in the unit area is immediate surrounding area?

A Yes.

Q Now, refer to Exhibit Number 2 and explain what it shows.

A Exhibit Number 2 is a structure map on the top of the San Andres formation. Essentially, it shows a structure in this

area to be an east or dipping nose type structure. Also shown is the unit outlined in red.

Q Any further comments with respect to this Exhibit?

A No.

Q Now, refer to Exhibit Number 3, exp. in that to the Commission.

A Exhibit Number 3 is a west to east cross-section of the general area. What is shown on it is the top of the Grayburg-Premier formation and the top of the San Andres productive interval. From this cross-section, we can see that both the Premier and the San Andres formation are continuous in this particular area.

Q There are actually two producing formations, but has the OCC treated this all as one pool, both formations?

A The Commission has treated this as all one producing horizon; the Yates, Seven Rivers, Queen, Grayburg, San Andres.

Q Now, refer to Exhibit Number 4, I believe it is, and explain this to the Commission.

A Exhibit Number 4 is a south to north cross-section of the general area. Also, the Premier and the top of the San Andres producing interval are marked on it and it likewise shows the continuity of the pay in this particular area.

Q So these two exhibits together, 3 and 4, do show a continuity of these two producing horizons over the whole unit

area?

A Yes, they do.

Q Now, refer to Exhibit Number 5 and explain what this is and what it shows.

A Exhibit Number 5 contains the schematic diagrams of the 13 wells that we plan to convert to injection.

MR. HINKLE: Excuse me. I may state here that Exhibit Number 5, the first page is numbered 5 and the attached exhibits are A through M, I believe, which is treated all as Exhibit Number 5 with some exhibits A, B and so forth. Go ahead.

A The first well shown on here is the Vandagriff C Number 2. What we plan to do is to set a packer at approximately 1140 feet and inject down the casing tubing annulus into the perforations to be made at approximately 1100 and 1110 feet. This will be the Premier formation. We plan to inject below the packer into the existing San Andres perforations at 6664 to 1720.

Q You might explain, is there any difference in any of these injection wells from this first one that you've explained?

A All of them will be similarly completed.

Q In other words, you'll have these dually completed so that you can inject into the two producing horizons separately?

A Yes, sir. We plan to inject into the Premier, down

the annulus and then down the tubing into the San Andres.

Q What is the purpose of dually completing these injection wells so that you can inject into each formation separately?

A There's a possibility that they will have different rates of injection into the particular formations and we would like to split the injection so that we can better control the flood, advance, so that one zone won't prematurely flood out above the other one. It's just a matter of control of injection.

MR. UTZ: The upper zone will be the Queen-Grayburg?

THE WITNESS: Grayburg. Premier-Grayburg.

MR. UTZ: Premier, only?

THE WITNESS: Yes, sir.

MR. UTZ: No Queen at all?

THE WITNESS: No.

Q (By Mr. Hinkle) Now, should you find that there is no appreciable difference in injection rates in the two zones and, in that case, would it be necessary to inject separately or could you inject the fluid just generally into both formations?

A If the injection rates and pressures are compatible, then we would desire to set a packer above the Premier and inject down the tubing into both zones.

Q And would you like to do that by an administrative order of the Commission rather than have a separate hearing --

A Yes.

Q -- for that purpose?

A Yes.

Q You would like the order approving a waterflood to so provide?

A Yes.

MR. UTZ: Would you run that by again?

THE WITNESS: Okay. If the Premier and Grayburg are compatible as far as injection rates and pressures, we would like then, at a later date, to set our packer above the Premier and inject it both into the Premier and the San Andres, down the tubing in that event.

Q Is there any further comment with respect to Exhibit Number 5?

A No.

Q Now, refer to Exhibit 6 and explain that to the Commission.

A It is a decline curve of the Red Lake unit. It shows the daily average or monthly production by month. Essentially, this shows that the pool is depleted. The average production per well in this unit, is five barrels of oil per day.

Q Now, when the unit agreement was filed for approval,

that is, the west Red Lake unit, did you file with the unit agreement an initial plan of development?

A Yes.

Q Refer to Exhibit Number 7. Is that the initial plan of development which you filed with the unit agreement?

A Yes, it is.

Q Has this been approved by the U.S.G.S.?

A Yes, it has.

Q Would you explain to the Commission briefly and in your own words, without reading the plan, just what it provides for.

A Essentially, what we plan to do is to initially convert four wells to injection. These are the Vandagriff-C No. 2, Vandagriff-C No. 3, Sterling No. 4 and Gant Federal No. 2. There on the west end of the unit. We would like to inject into these for a period of time to determine what the injection rate will be and pressures so that we can better size our equipment for the entire flood.

After we have injected into these and have injection histories, then we'll expand the flood to the total of eleven injectors, and leaving out the Federal EG No. 1 and the Mann Federal No. 2 on the far east end, which will be converted at a later date. Approximately 4000 barrels of water a day will be injected at around a thousand pounds of pressure when we

have converted the eleven wells. We anticipate a waterflood recovery of 400 and 600,000 barrels of oil and we will purchase our water from Double Eagle Corporation.

Q What has been the primary recovery in this area?

A It's 965,000 barrels, approximately.

Q What are you purchasing from Double Eagle, will it be fresh water?

A Yes, it will.

Q In your opinion, will this waterflood project, if approved, be in the interest of conservation and prevention of waste?

A Yes, it will.

Q Will it permit you to get your greatest ultimate recovery in gas substances?

A Yes.

MR. KELLAHIN: We would like to offer into evidence Exhibits 1 through 7.

MR. UTZ: Without objection, Exhibits 1 through 7 --

MR. KELLAHIN: There's one other question I'd like to ask of this witness.

Q (By Mr. Kellahin) Is Atlantic Richfield seeking a project allowable in this case?

A Yes, they are.

Q That's in accordance with Rule 701-E?

A Yes.

MR. KELLAHIN: I believe that's all.

MR. UTZ: What was Exhibit Number 7?

MR. KELLAHIN: That was the plan of development,
the initial plan of development.

MR. UTZ: I didn't get one of these marked.

MR. KELLAHIN: You didn't?

(Whereupon, Applicant's Exhibits
6 and 7 were marked for
identification).

CROSS EXAMINATION

BY MR. UTZ:

Q You, as I gather, don't intend to use plastic-coated
tubing in this system, either?

A No, sir, we do not.

Q And for the present time, you'll inject as a dual
completion down the tubing and annulus on all your injection
wells until you apply for administrative approval to do other-
wise?

A Yes, sir.

Q In regards to your cementing program on these 13
injection wells, can we generalize on all 13 of them as to
how far above the perforations the cement comes?

A Approximately, at least 270 feet above.

Q That would be a minimum cement?

A Yes.

Q Now, that's above the Premier perforations?

A Above the Premier perforations. I don't think we have any less than that. There is one exception, I think. We will have to cement higher in our Mann Federal No. 1. We show five and a half inch casing set at 1909 with 25 sacks of cement; the top at 1775.

Q Which exhibit is that?

A This is 5-K.

Q What was the detail on that?

A Five and a half inch casing set at 1909 with 25 sacks of cement; cement tops at 1775. On the right hand side of the exhibit, we state that we propose to perforate and cement with 150 sacks at 1600 feet.

Q So you're going to squeeze cement in that well?

A Yes. The well will be more of a primary cement job. We will be perforating above the existing top of cement, and cement with 150 sacks. A great number of the wells had cement circulated to the surface.

Q Now, in regard to your surface casing, is all the surface casing circulated?

A Yes, sir.

Q And all the surface casing is set below a thousand feet, isn't it?

A No.

Q Originally, 580?

A No. It's 863, I think.

Q In your opinion, is all the surface casing set and cemented to protect any fresh water that may be in the area?

A Yes, sir. I think the fresh water will be protected. For instance, on Exhibit 5-G, we have thirteen and three-eighths inch casing set at thirty feet only, but the well was cemented to the surface.

Q So your four and a half is cemented?

A Yes, sir. So the four and a half was cemented to the surface, which would protect the fresh water zone.

Q You said cement circulated and then you said calculated. It's hard having to calculate it if it's circulated, isn't that right?

A Well, some of the records leave a little to be desired. This, we'll agree on. We went to three sources to get it. We went to U.S.G.S. and the old scout tickets and then the records that were given to us when we purchased them and we still, even with these sources, we didn't find all of the information on them.

Q Now, initially -- first let me ask you this. Does Exhibit Number 7 show all of the injection wells, all thirteen of them?

A Yes, sir, it does. There's a plat which is Figure

No. 1 on Exhibit 7 which shows all of the injection wells.

That would be Figure No. 1 of Exhibit 7.

Q Yes, I'm finding it.

A Yes. It has all of them marked on it.

Q Now, initially, you plan to inject into how many wells?

A Into four wells.

Q And which four are those?

A They're on the west side there and ~~they're the~~ Vandagriff C No. 2, which is in Section 7, Vandagriff C No. 3, that would be just above it, Sterling No. 4, is over on the far west side, that would be in the middle on the west side, and Gant Federal No. 2 is just below Vandagriff C 2.

Q And what was your statement in regard to how long you will inject into these?

A We plan to inject into them only -- we plan to inject into them for about a period of four months to determine the injectivity of the Premier and the San Andres and from this information, then we'll size our equipment and convert our other wells to injection.

Q From that point on, you will know whether you want a dual injector?

A Yes, sir.

Q Then you said something about leaving two wells until

some later date?

A Yes. The two far eastern wells will be left till a later date. They are Federal EG No. 1 in the northeast quarter and the Mann Federal No. 2. There's somewhat of a water drive from this direction and we would like to convert the other wells, see how the flood goes and see how these two wells react before we make a final decision as to whether we could recover more oil by converting or by means of a natural water drive from the east.

Q Do you have a copy of your application?

A No, I don't have it with me.

Q I need to know if the locations and the names of these thirteen wells listed in your application are correct?

A Yes, they are correct.

Q They are correct?

A Yes.

Q And you don't intend to change the names of these wells to the ~~west~~ Red Lake Unit No. so and so, or else leave their present names on?

A They will be changed. We had the track and well numbers.

Q Do you know at this time what the changes will be?

A I imagine I have that or we could at least determine it on this.

MR. KELLAHIN: At the time that this application was filed, the West Red Lake Unit had not been approved and we listed the wells just as they appear on your records at the present time.

Q When can you supply us with this data?

A We could mail it to you tomorrow or we could give it to you before we leave today, if you'd like.

Q We'd like that.

A All right.

Q Just take care of the applications and make the changes on those so we will know what they are and we will put them in the Order correctly.

A All right.

MR. UTZ: Are there other questions of the witness?

MR. KELLAHIN: I offer into evidence these exhibits. In my other tender of exhibits, I think I only said 1 through 5. It should be 1 through 7.

MR. UTZ: Exhibits 1 through 7 will be entered into the record. If there are no further questions of the witness, he may be excused. Are there any other further statements in this case?

MRS. DU HAIME: Sir, how do you describe that injection pattern?

THE WITNESS: It's a perimiter or periperal type

flood.

MR. UTZ: We will take the case under advisement.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, CHARLOTTE J. MACIAS, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me; and that the same is a true and correct record of the said proceedings, to the best of my knowledge, skill and ability.

Witness my Hand and Seal this 30th day of August, 1968.

Charlotte Macias
Notary Public

My Commission Expires:

Feb. 10, 1971

I do hereby certify that the foregoing is a complete record of the proceedings in the hearing of Case No. 3824 heard by me on Aug 19, 68.
Charlotte Macias Notary
New Mexico Oil Conservation Commission

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

APPLICATION OF ATLANTIC RICHFIELD)
COMPANY FOR APPROVAL OF A WATER FLOOD)
PROJECT FOR THE WEST RED LAKE UNIT)
AREA COMPRISING 1,237 ACRES, MORE OR)
LESS, OF FEDERAL AND FEE LANDS IN)
TOWNSHIP 18 SOUTH, RANGE 27 EAST,)
N.M.P.M. BY THE INJECTION OF WATER)
INTO 13 WELLS COMPLETED IN THE RED)
LAKE QUEEN - GRAYBURG - SAN ANDRES)
POOL)

Case 3824

68 JUL 12 AM 8 24

Oil Conservation Commission
Box 2088
Santa Fe, New Mexico 87501

Comes Atlantic Richfield Company, acting by and through the undersigned attorneys, and hereby makes application for approval of a water flood project for the West Red Lake Unit Area comprising 1,237 acres, more or less, of federal and fee lands in Township 18 South, Range 27 East, N.M.P.M. by the injection of water into 13 wells completed in the Red Lake Queen - Grayburg - San Andres Pool, Eddy County, New Mexico, and in support thereof respectfully shows:

1. That applicant is the unit operator of the West Red Lake Unit Agreement heretofore approved by the Commission and which comprises 1,237 acres of federal and fee lands in Township 18 South, Range 27 East, N.M.P.M. Eddy County.

2. That applicant seeks approval of a secondary recovery project covering all of the lands within the West Red Lake Unit Area by the injection of water into 13 wells heretofore completed in the Red Lake Queen - Grayburg - San Andres Pool, said wells, all located in Township 18 South, Range 27 East, being as follows:

1. Mann Federal No. 1 located 990 feet from the north line and 330 feet from the west line of Section 9. —

2. Vandagriff "A" Federal No. 1 located 2340 feet from the south line and 400 feet from the east line of Section 8. —

3. Vandagriff "C" No. 2 located 1650 feet from the north line and 330 feet from the east line of Section 7. ✓
4. Mann Federal No. 2 located 660 feet from the north line and 1980 feet from the west line of Section 9. ✓
5. Sterling No. 4 located 1650 feet from the west line and 2310 feet from the north line of Section 7. ✓
6. Vandagriff "C" No. 3 located 330 feet from the north line and 990 feet from the east line of Section 7. ✓
7. Federal "EG" No. 1 located 1592 feet from the south line and 2302 feet from the west line of Section 4. ✓
8. Gant Federal No. 2 located 2240 feet from the south line and 400 feet from the east line of Section 7. ✓
9. Sterling No. 2 located 330 feet from the north line and 990 feet from the west line of Section 7. ✓
10. Picher Federal No. 5 located 990 feet from the north line and 2310 feet from the east line of Section 8. ✓
11. Kaiser No. 4 located 1980 feet from the east line and 990 feet from the south line of Section 7. ✓
12. Simon Federal "A" No. 1 located 990 feet from the south line and 330 feet from the west line of Section 5. ✓
13. Brainard No. 4 located 990 feet from the south line and 660 feet from the east line of Section 5. ✓

3. That there is attached hereto a plat showing the location of the proposed injection wells and the location of all other wells within a radius of 2 miles from said proposed injection wells and the formation from which said wells are producing or have produced. The plat also indicates the lease owners within a radius of 2 miles.

4. That there is also filed herewith logs of 7 of the proposed injection wells. The logs of the other 6 wells are not filed due to the fact that the logs are not available as these wells have been completed for a considerable length of time.

5. There is also filed herewith a diagrammatic sketch of each of the proposed injection wells showing all casing strings, including diameters and setting depths, quantities used and tops of cement, perforated or open hole intervals, tubing strings, including diameters and setting depths, and packers which will be used.

6. That applicant seeks to have assigned to the West Red Lake Unit Area the maximum project allowable in accordance with Rule 701 of the Commission.

7. Applicant believes that the proposed water flood project for the West Red Lake Unit Area is in the interest of conservation and the prevention of waste and will promote the greatest ultimate recovery of oil and gas from the project area.

8. A copy of this application, together with a copy of the plat, logs, and diagrammatic sketches, are being furnished to the office of the State Engineer, Capitol Building, Santa Fe, in accordance with the provisions of Rule 701.

Applicant requests that this matter be set down for hearing at the examiner's hearing to be held on August 7.

Respectfully submitted,

ATLANTIC RICHFIELD COMPANY

By 

Member of the Firm of
HINKLE, BONDURANT & CHRISTY
Attorneys for Applicant

Box 10

Roswell, New Mexico

DOCKET: EXAMINER HEARING - WEDNESDAY - AUGUST 7, 1968

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

The following cases will be heard before Elvis A. Utz, Examiner, or Daniel S. Nutter, Alternate Examiner:

CASE 3778: (Continued from the June 5, 1968 Examiner Hearing)

Application of Atlantic Richfield Company for a dual completion and salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dually complete its State BH Well No. 1 located 660 feet from the North and West lines of Section 13, Township 19 South, Range 34 East, Quail-Queen Pool, Lea County, New Mexico, in such a manner as to permit production of oil from 5080 feet to 5136 feet in the lower Queen formation through tubing and the disposal of produced salt water into the upper Queen formation through the casing-tubing annulus in the perforated interval from 4820 feet to 4830 feet.

CASE 3823: Application of Atlantic Richfield Company for salt water disposal, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the San Andres and Paddock formations in its State "A" Well No. 45 located in Unit G, Section 26, Township 17 South, Range 28 East, Empire-Abbo Pool, Eddy County, New Mexico, in the perforated interval from 2738 feet to 3032 feet (San Andres) and 3809 feet to 4030 feet (Paddock).

CASE 3824: Application of Atlantic Richfield Company for a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in its West Red Lake Unit Area by the injection of water into the Queen, Grayburg, and San Andres formations through 13 wells located in Sections 4, 5, 7, 8, and 9, Township 18 South, Range 27 East, Red Lake Queen Grayburg-San Andres Pool, Eddy County, New Mexico.

CASE 3825: Application of Pan American Petroleum Corporation for a unit agreement, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks approval of the East Buffalo Valley Unit Area comprising 15,350 acres, more or less, of Federal, State and Fee lands in Township 14 South, Ranges 28 and 29 East, Chaves County, New Mexico.

CASE 3642: (Reopened)

In the matter of Case No. 3642 being reopened pursuant to the provisions of Order No. R-3305, which order established 640-acre spacing units for the North Osudo-Morrow Gas Pool, Lea County, New Mexico, for a period of one year. All interested parties may appear and show cause why said pool should not be developed on 320-acre spacing units.

CLARENCE E. HINKLE
W. E. BONDURANT, JR.
S. B. CHRISTY IV
LEWIS C. COX, JR.
PAUL W. EATON, JR.
CONRAD E. COFFIELD
HAROLD L. HENSLEY, JR.
MICHAEL R. WALLER
STUART D. SHANOR

LAW OFFICES
HINKLE, BONDURANT & CHRISTY
600 HINKLE BUILDING
ROSWELL, NEW MEXICO 88201

July 10, 1968

MIDLAND, TEXAS OFFICE
521 MIDLAND TOWER
(915) MU 3-4891
OF COUNSEL: HIRSH M. DOW

TELEPHONE (505) 622-6510
POST OFFICE BOX 10

Page 3824

Oil Conservation Commission
Box 2088
Santa Fe, New Mexico 87501

Gentlemen:

We enclose in triplicate application of Atlantic Richfield Company for approval of a water flood project for the West Red Lake Unit Area in Township 18 South, Range 27 East, Eddy County.

We would appreciate your setting this matter down for hearing at the examiner's hearing to be held on August 7.

Yours very truly,

HINKLE, BONDURANT & CHRISTY

By 

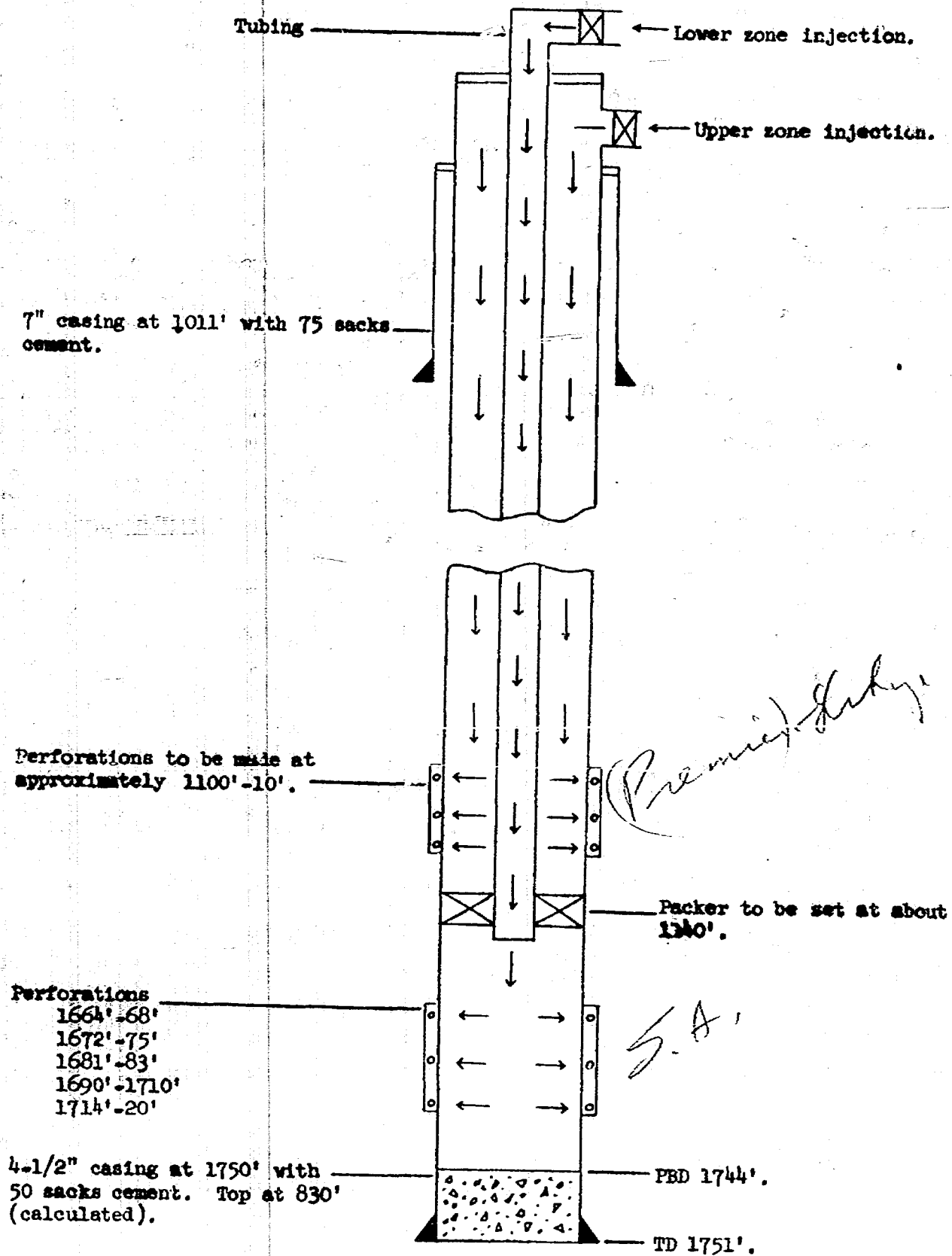
CEH:cs
Enc.
cc: Atlantic Richfield

68 JUL 12 AM 10 23

DOCKET MAILED

Date 7-26-68

ATLANTIC RICHFIELD COMPANY
 WEST RED LAKE UNIT
 SCHEMATIC DRAWING OF INJECTION WELL
 VANDAGRIFT "C" NO. 2
 1650' FNL & 330' FEL, Sec. 7, T-18-N, R-27-E
 EDDY COUNTY, NEW MEXICO



BEFORE EXAMINER UTZ
 CONSERVATION COMMISSION
 EXHIBIT NO. 5
 CASE NO. 3824

EXHIBIT NO. 5-A

ATLANTIC RICHFIELD COMPANY
 WEST RED LAKE UNIT
 SCHEMATIC DRAWING OF INJECTION WELL
 VANDAGRIFF "C" NO. 3
 330' FNL & 990' FRL, Sec. 7, T-18-S, R-27-E
 EDDY COUNTY, NEW MEXICO

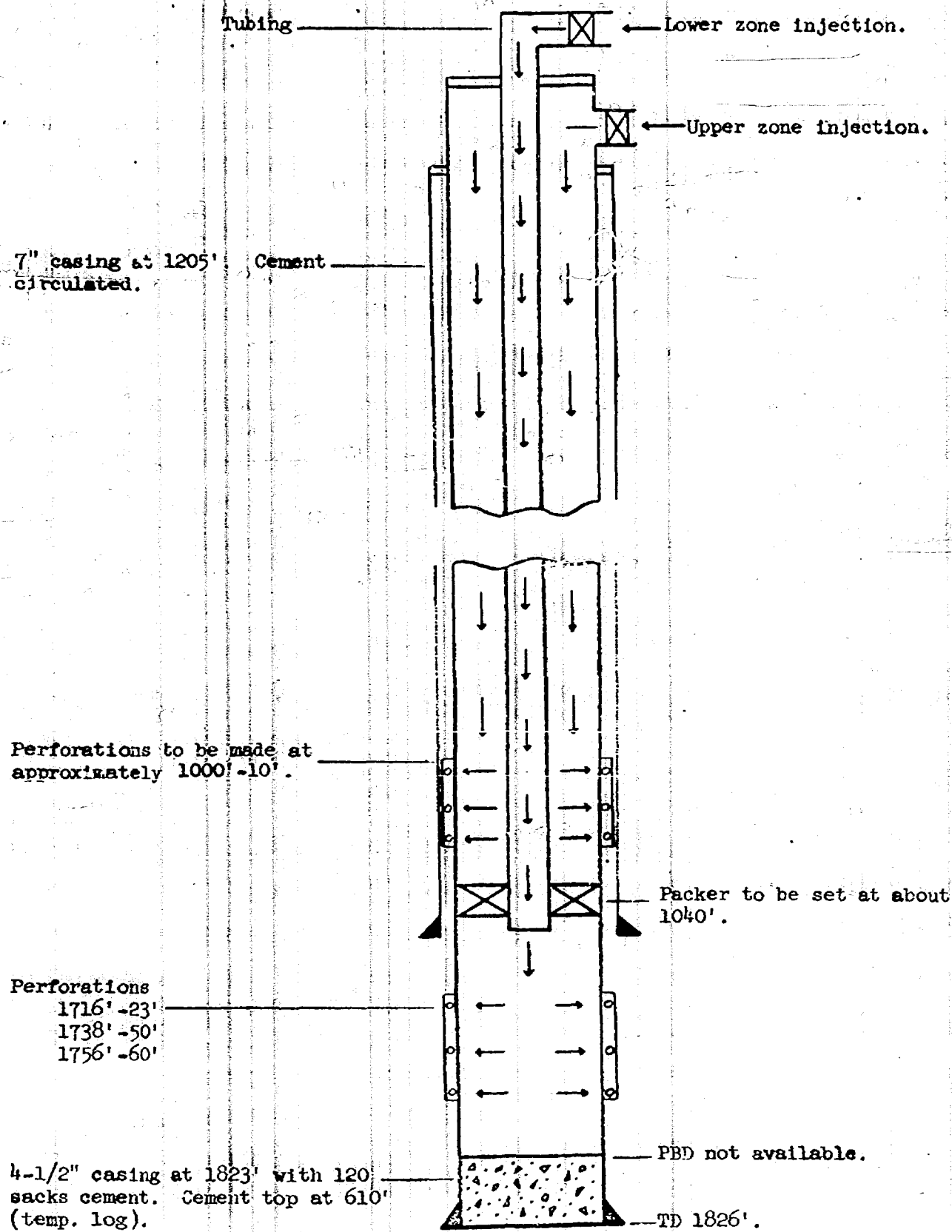


EXHIBIT NO. S-B

ATLANTIC RICHFIELD COMPANY
 WEST RED LAKE UNIT
 SCHEMATIC DRAWING OF INJECTION WELL
 STERLING NO. 4
 1650' FWL & 2310' FWL, Sec. 7, T-18-S, R-27-E
 EDDY COUNTY, NEW MEXICO

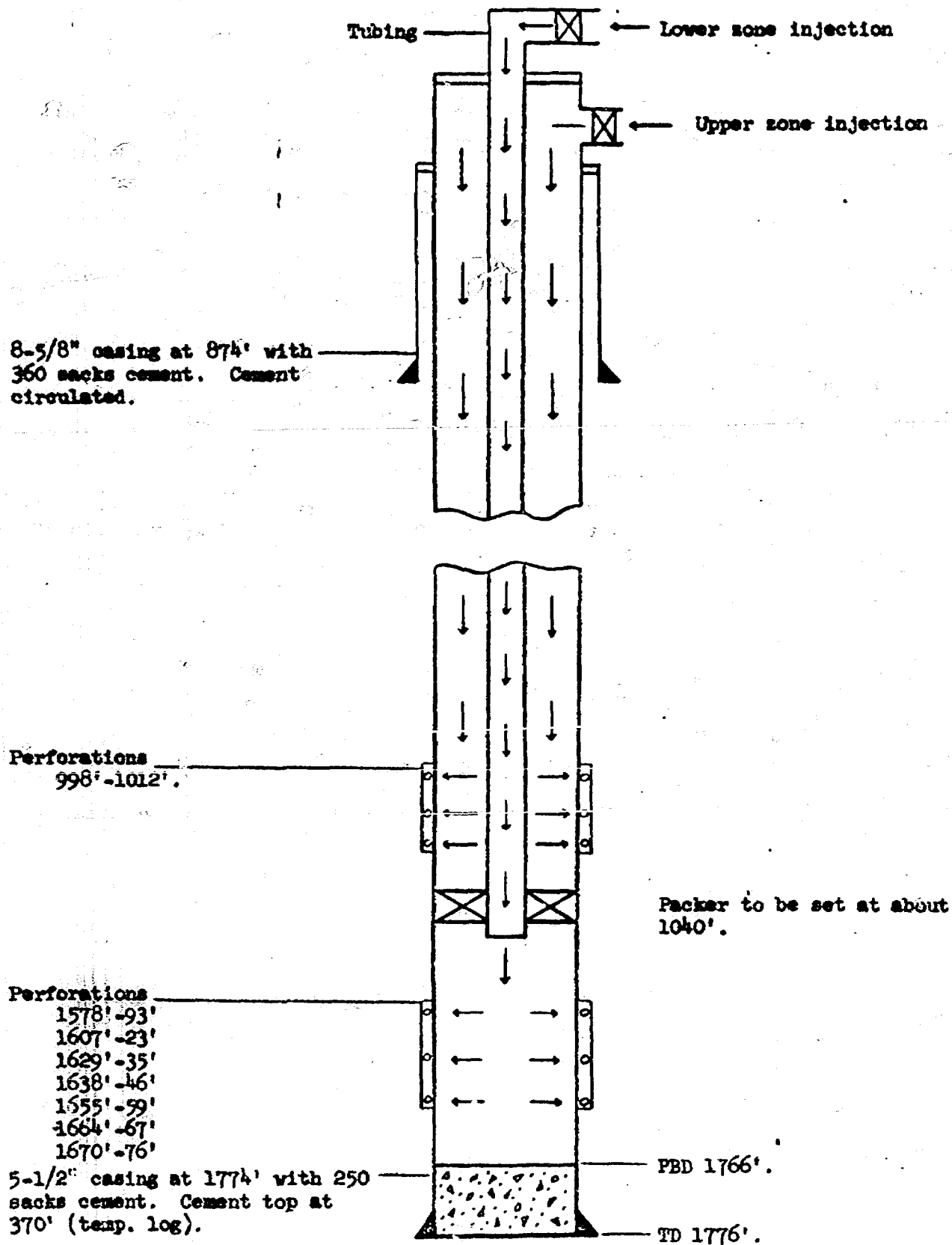
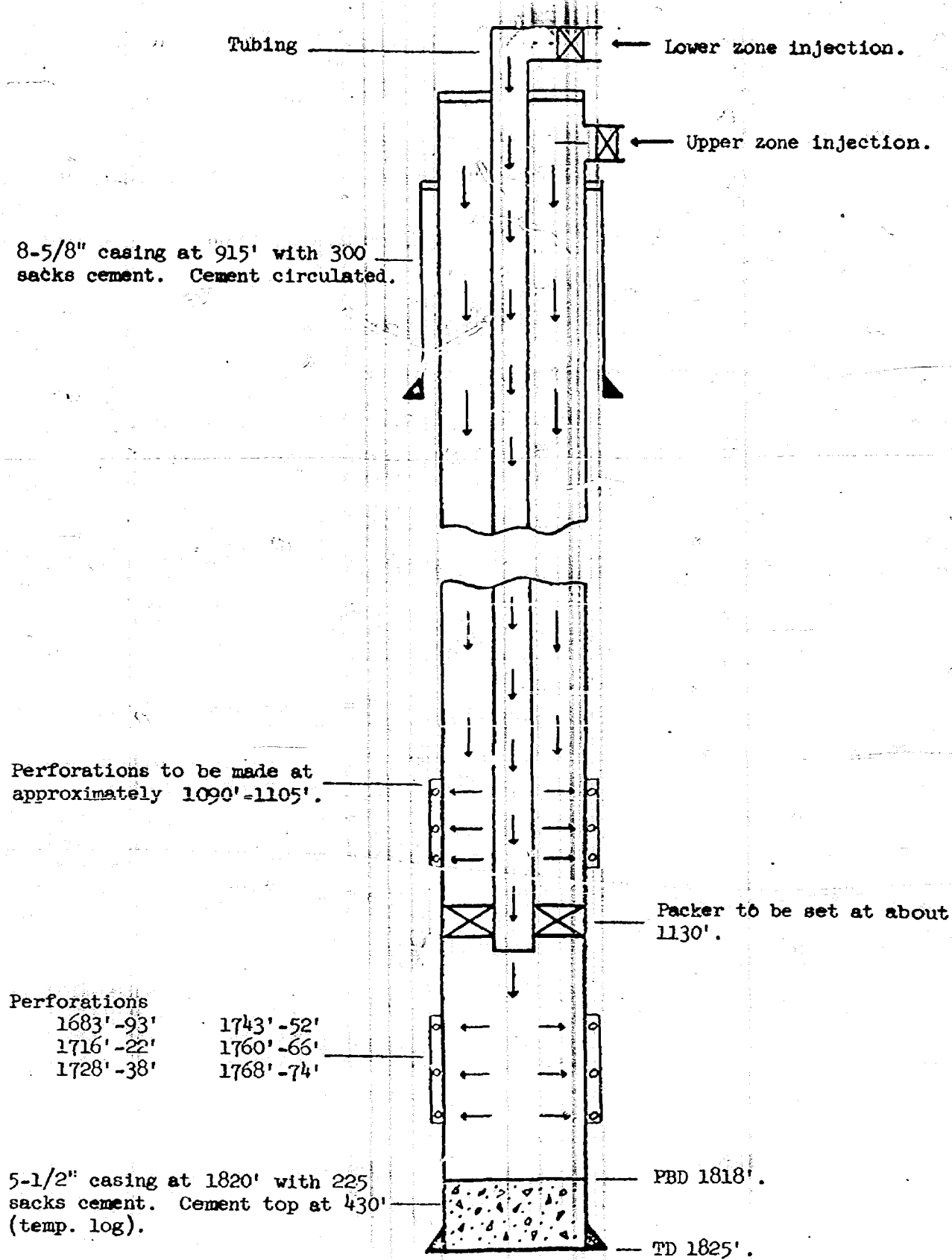
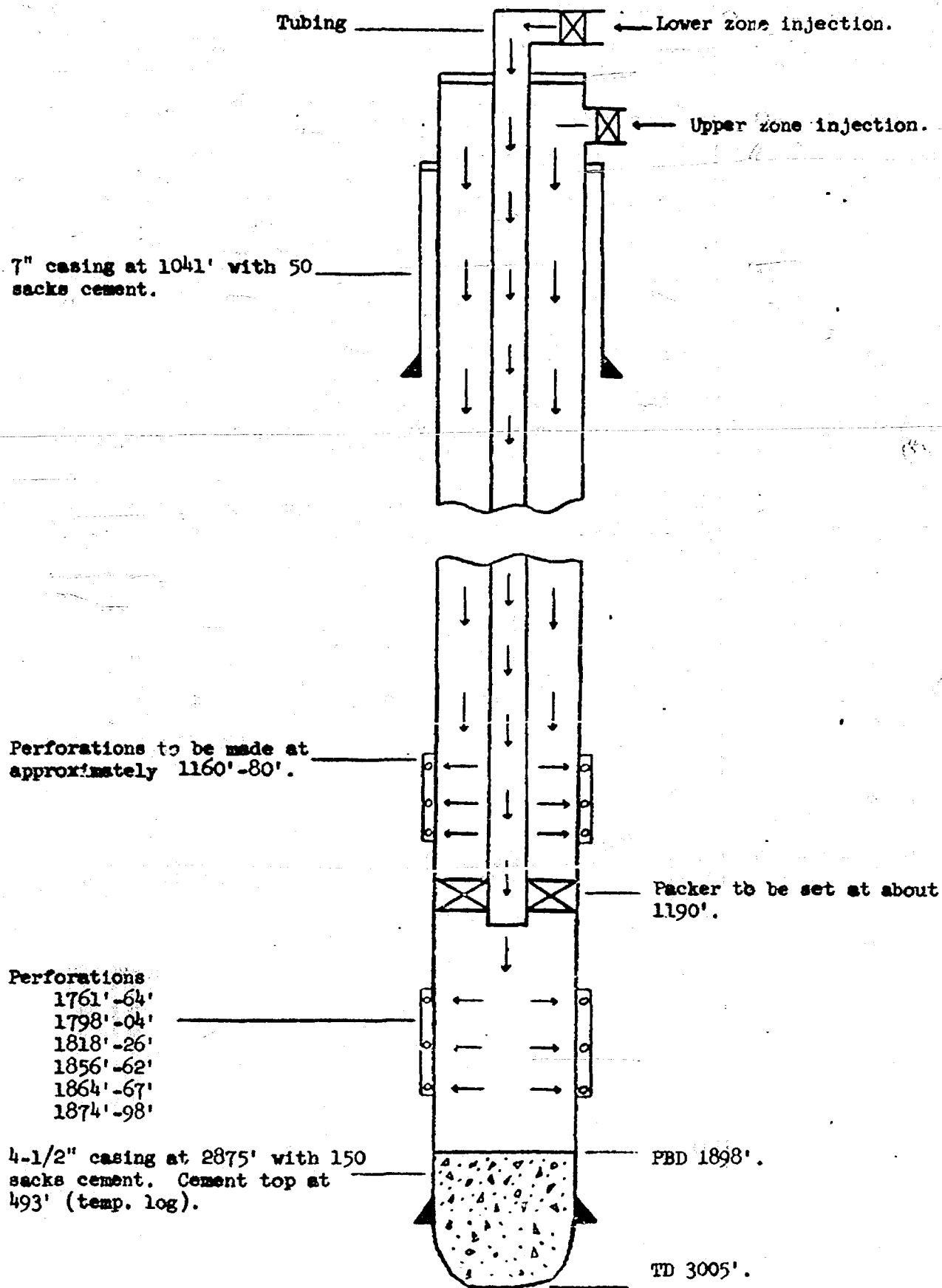


EXHIBIT NO. S-C

ATLANTIC RICHFIELD COMPANY
 WEST RED LAKE UNIT
 SCHEMATIC DRAWING OF INJECTION WELL
 GANT FEDERAL NO. 2
 2240' FSL & 400' TEL, Sec. 7, T-18-S, R-27-E
 EDDY COUNTY, NEW MEXICO



ATLANTIC RICHFIELD COMPANY
 WEST RED LAKE UNIT
 SCHEMATIC DRAWING OF INJECTION WELL
 PICHER FEDERAL NO. 5
 990' FNL & 2310' FEL, Sec. 8, T-18-S. R-27-E
 EDDY COUNTY, NEW MEXICO



ATLANTIC RICHFIELD COMPANY
 WEST RED LAKE UNIT
 SCHEMATIC DRAWING OF INJECTION WELL
 BRAINARD NO. 4
 990' FEL & 660' FEL, Sec. 5, T-18-S, R-27-E
 EDDY COUNTY, NEW MEXICO

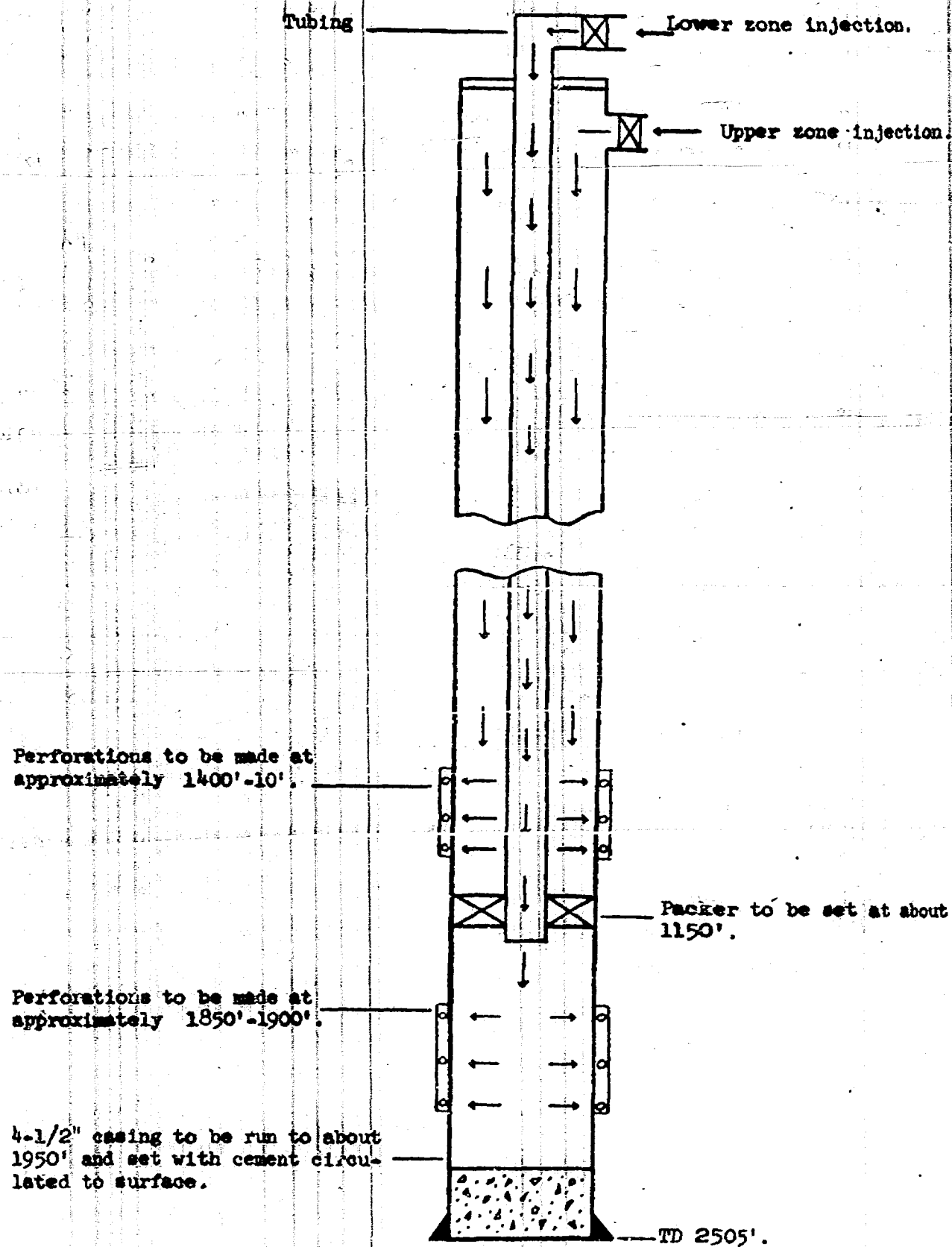
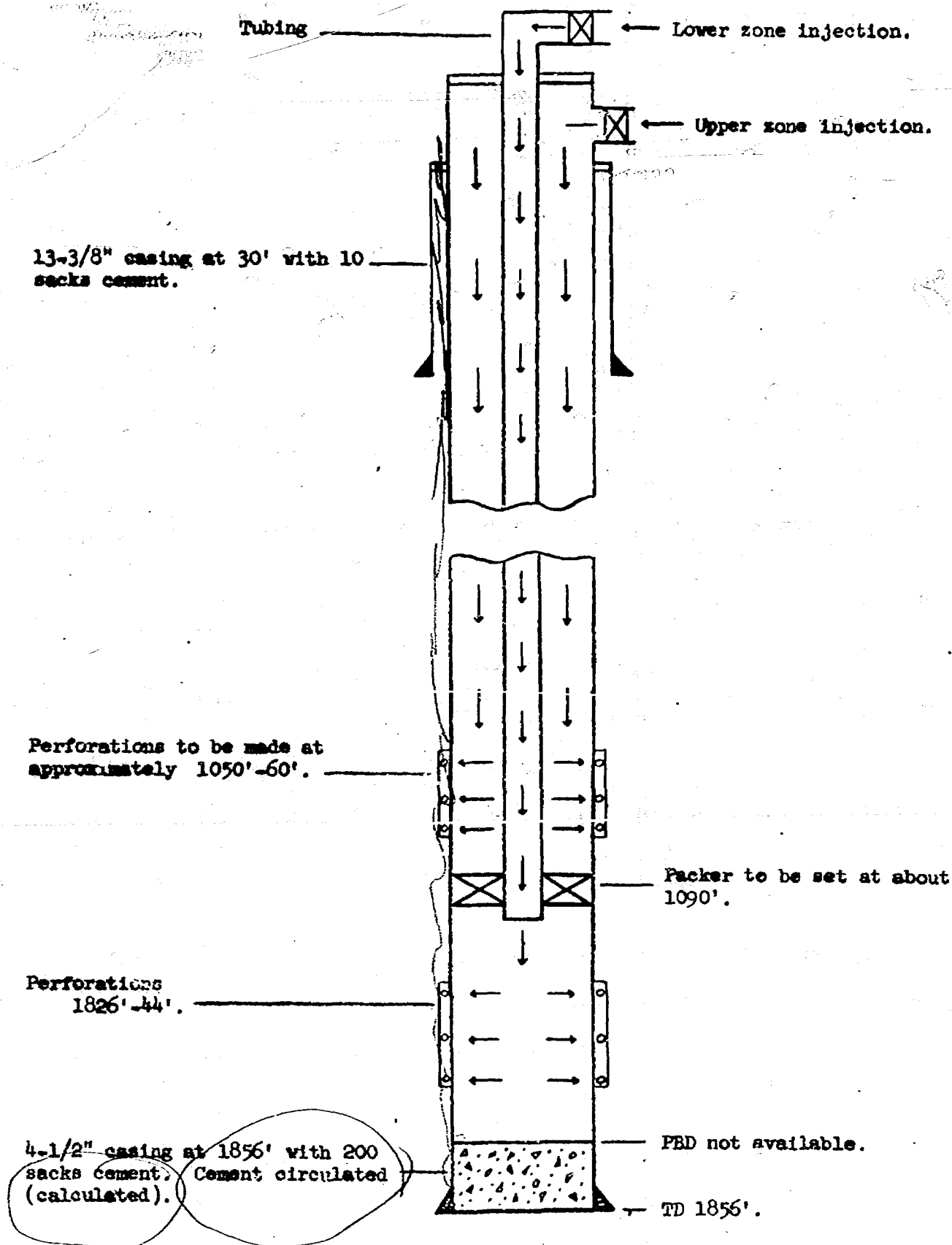


EXHIBIT NO. S-E

ATLANTIC RICHFIELD COMPANY
 WEST RED LAKE UNIT
 SCHEMATIC DRAWING OF INJECTION WELL
 SIMON FEDERAL "A" NO. 1
 990' FSL & 330' FWL, Sec. 5, T-18-S, R-27-E
 EDDY COUNTY, NEW MEXICO



ATLANTIC RICHFIELD COMPANY
 WEST RED LAKE UNIT
 SCHEMATIC DRAWING OF INJECTION WELL
 KAISER NO. 4
 1980' FEL & 990' FSL, Sec. 7, T-18-S, R-27-E
 EDDY COUNTY, NEW MEXICO

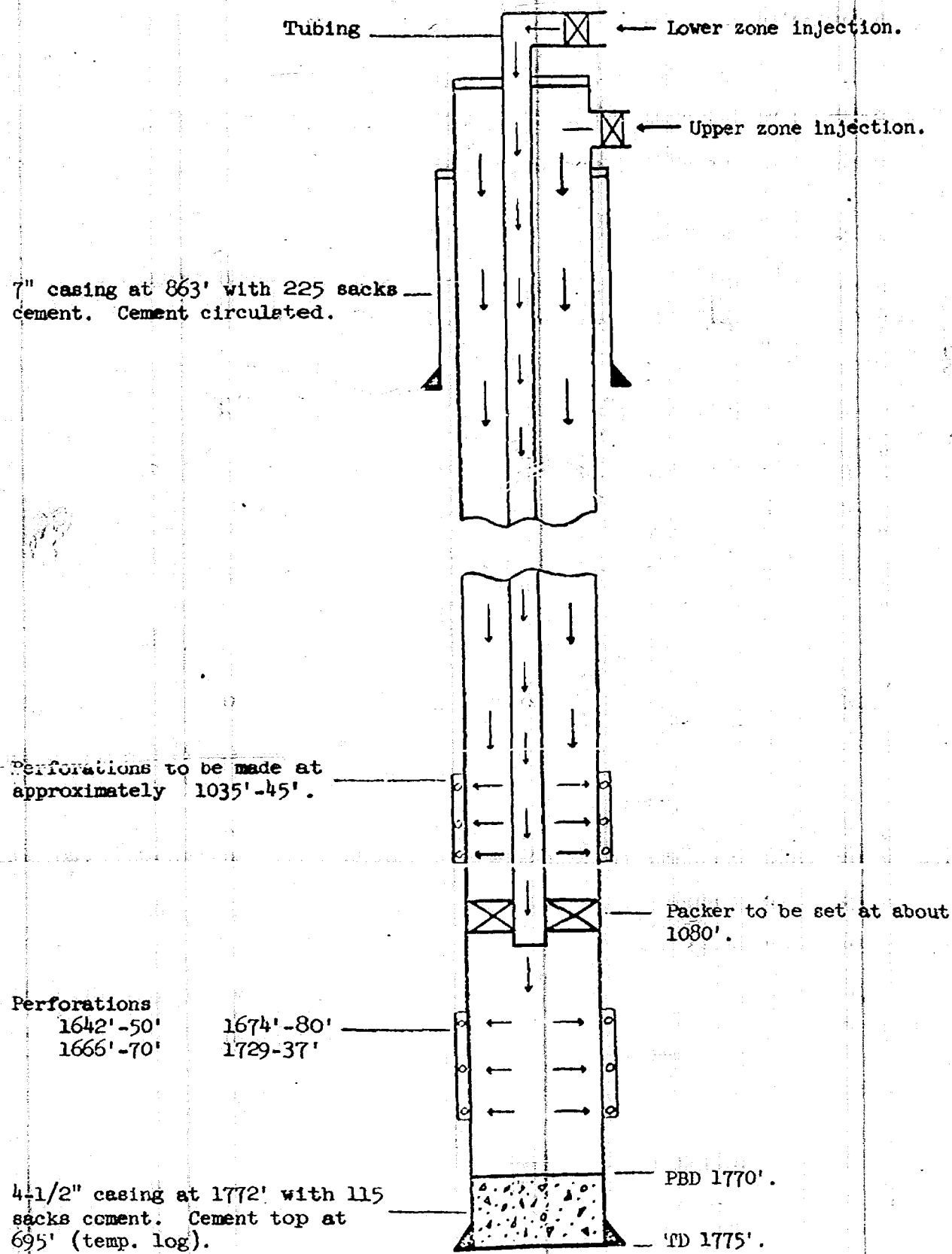
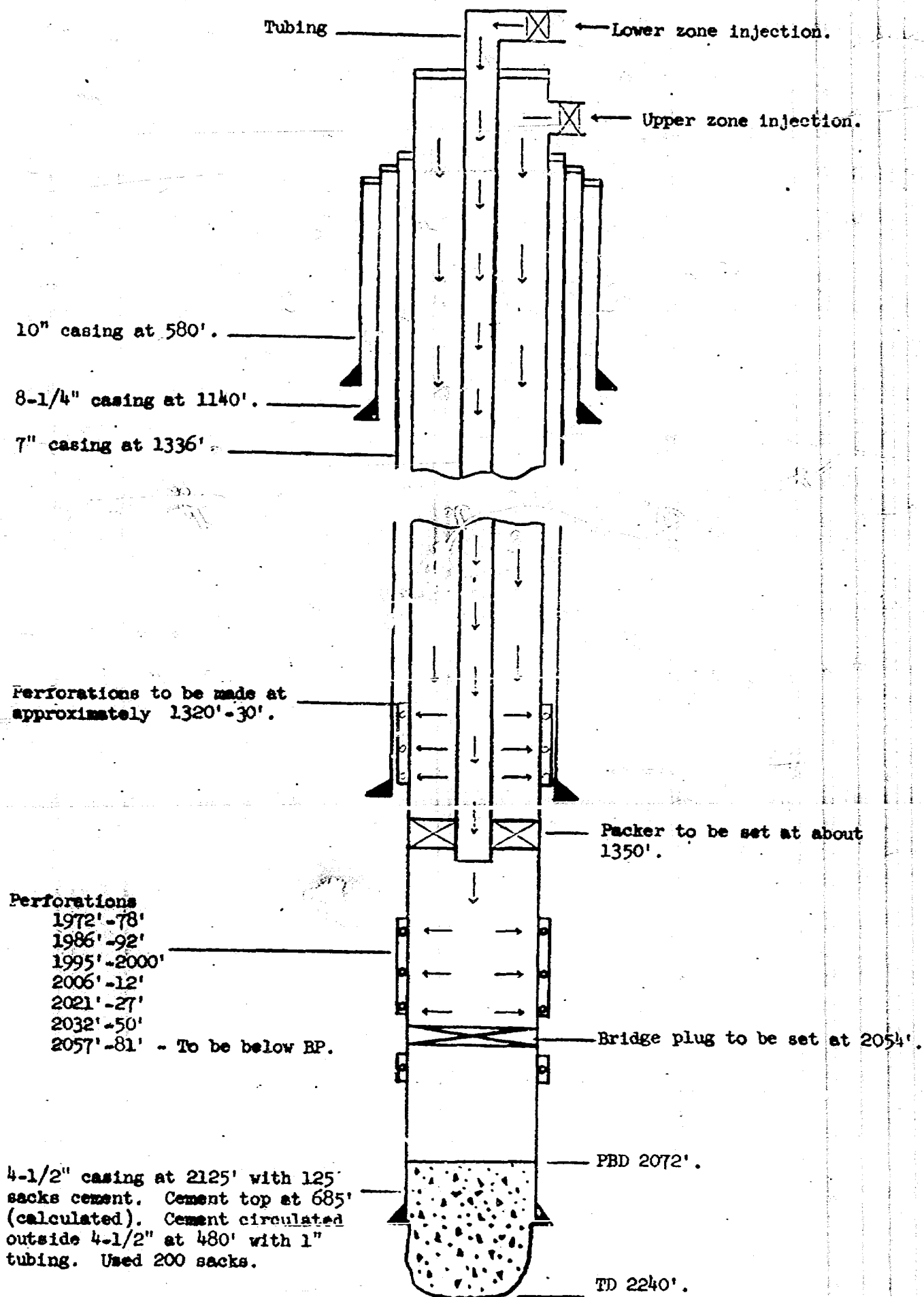
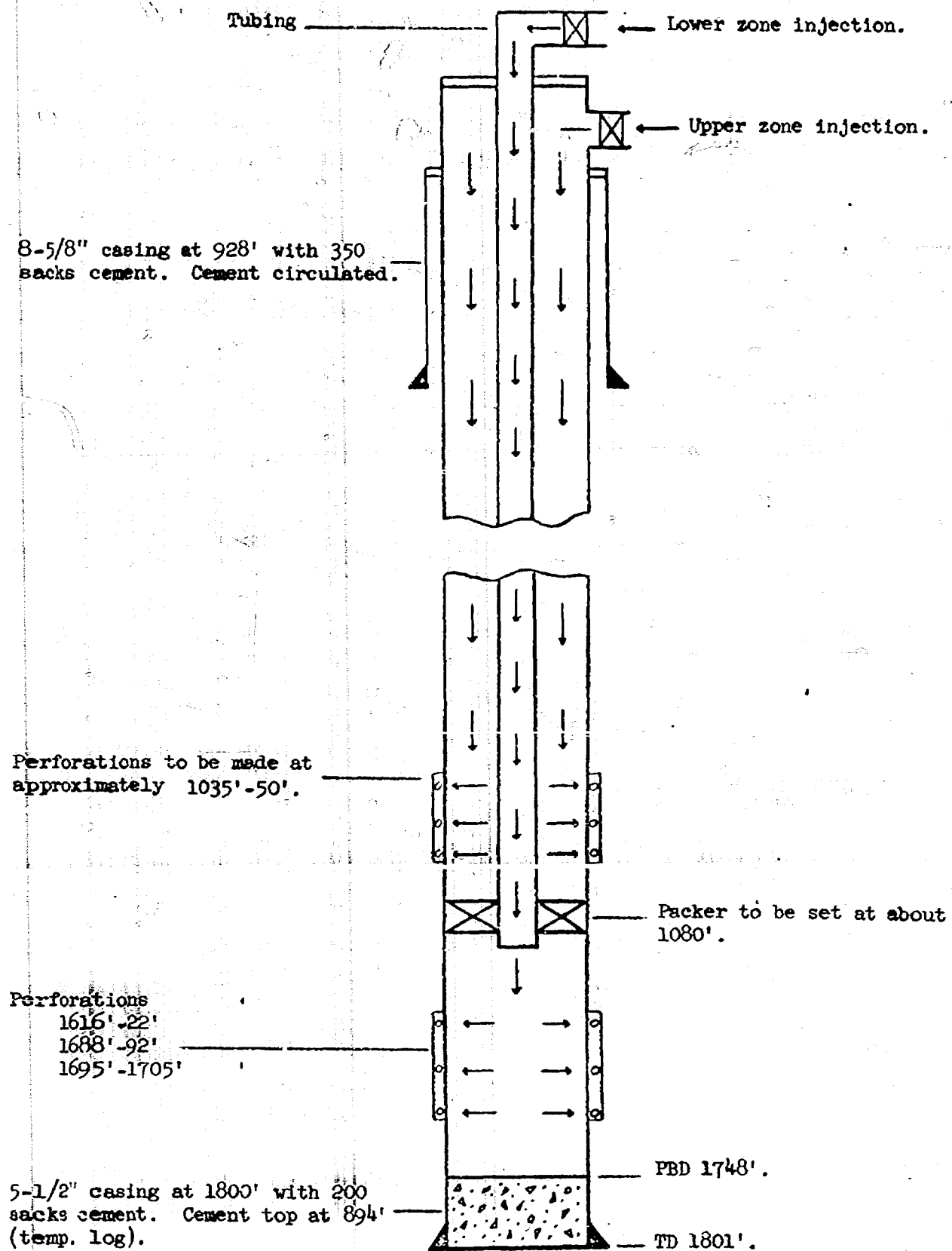


EXHIBIT NO. 5-H

ATLANTIC RICHFIELD COMPANY
 WEST RED LAKE UNIT
 SCHEMATIC DRAWING OF INJECTION WELL
 VANDAGRIFF "A" NO. 1
 2340' FSL & 400' FEL, Sec. 8, T-18-S, R-27-E
 EDDY COUNTY, NEW MEXICO



ATLANTIC RICHFIELD COMPANY
 WEST RED LAKE UNIT
 SCHEMATIC DRAWING OF INJECTION WELL
 STERLING NO. 2
 330' FNL & 990' FWL, Sec. 7, T-18-S, R-27-E
 EDDY COUNTY, NEW MEXICO



ATLANTIC RICHFIELD COMPANY
 WEST RED LAKE UNIT
 SCHEMATIC DRAWING OF INJECTION WELL
 MANN FEDERAL NO. 1
 990' FNL & 330' FWL, Sec. 9, T-18-S, R-27-E
 EDDY COUNTY, NEW MEXICO

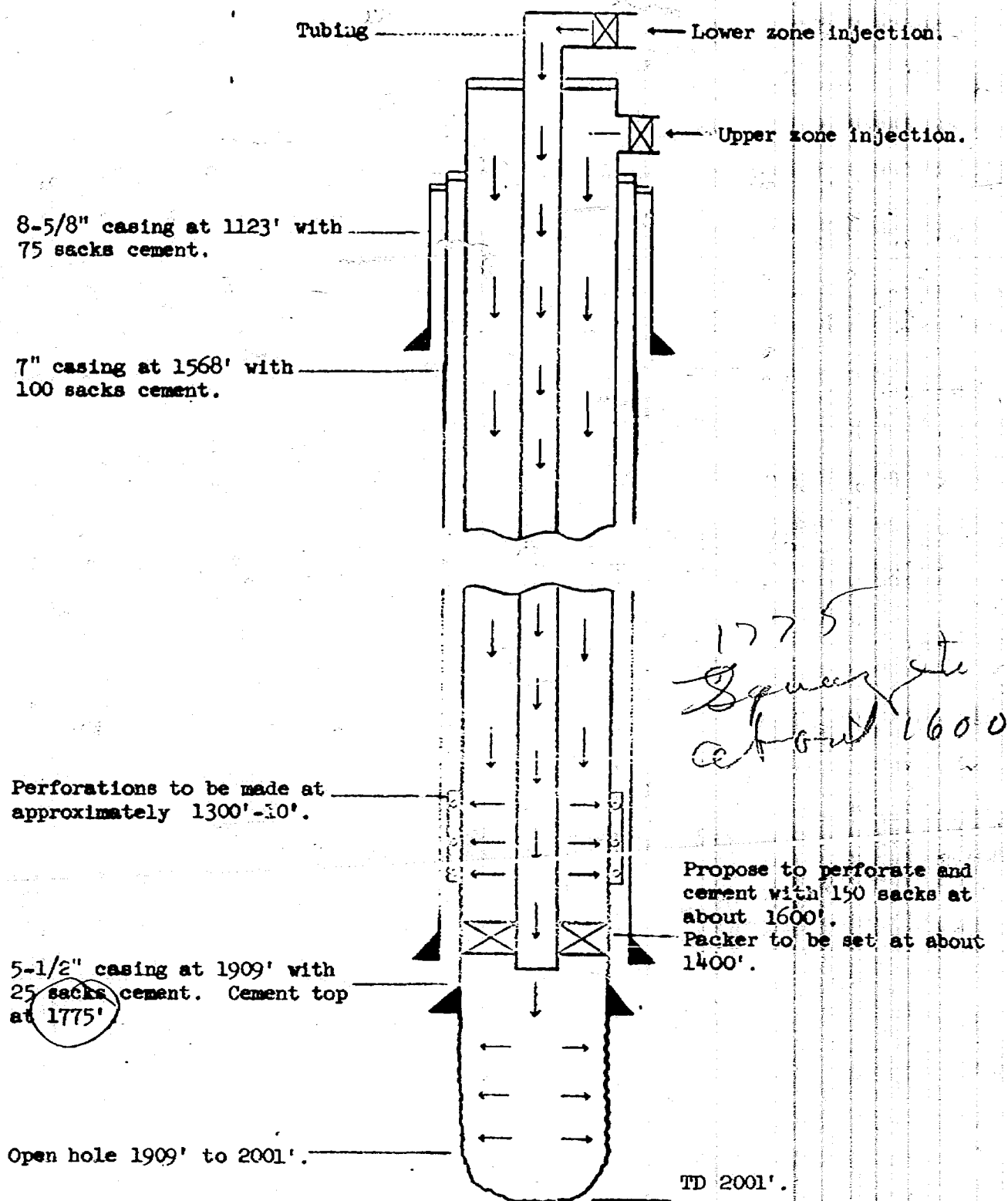
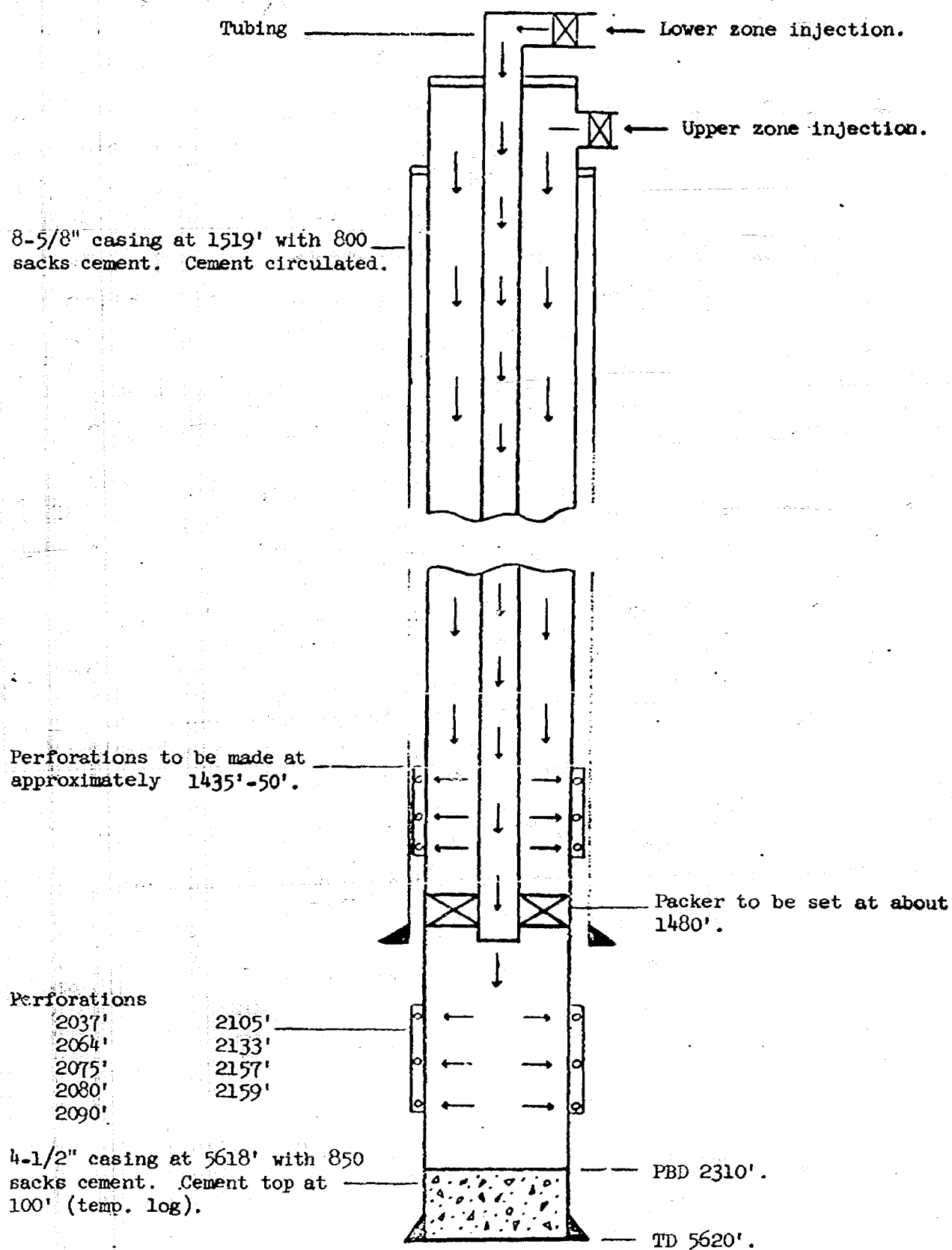


EXHIBIT NO. S-K

ATLANTIC RICHFIELD COMPANY
 WEST RED LAKE UNIT
 SCHEMATIC DRAWING OF INJECTION WELL
 FEDERAL "EG" NO. 1
 1592' FSL & 2302' FWL, Sec. 4, T-18-S, R-27-E
 EDDY COUNTY, NEW MEXICO



ATLANTIC RICHFIELD COMPANY
 WEST RED LAKE UNIT
 SCHEMATIC DRAWING OF INJECTION WELL
 MANN FEDERAL NO. 2
 660' FNL & 1980' FWL, Sec. 9, T-18-S, R-27-E
 EDDY COUNTY, NEW MEXICO

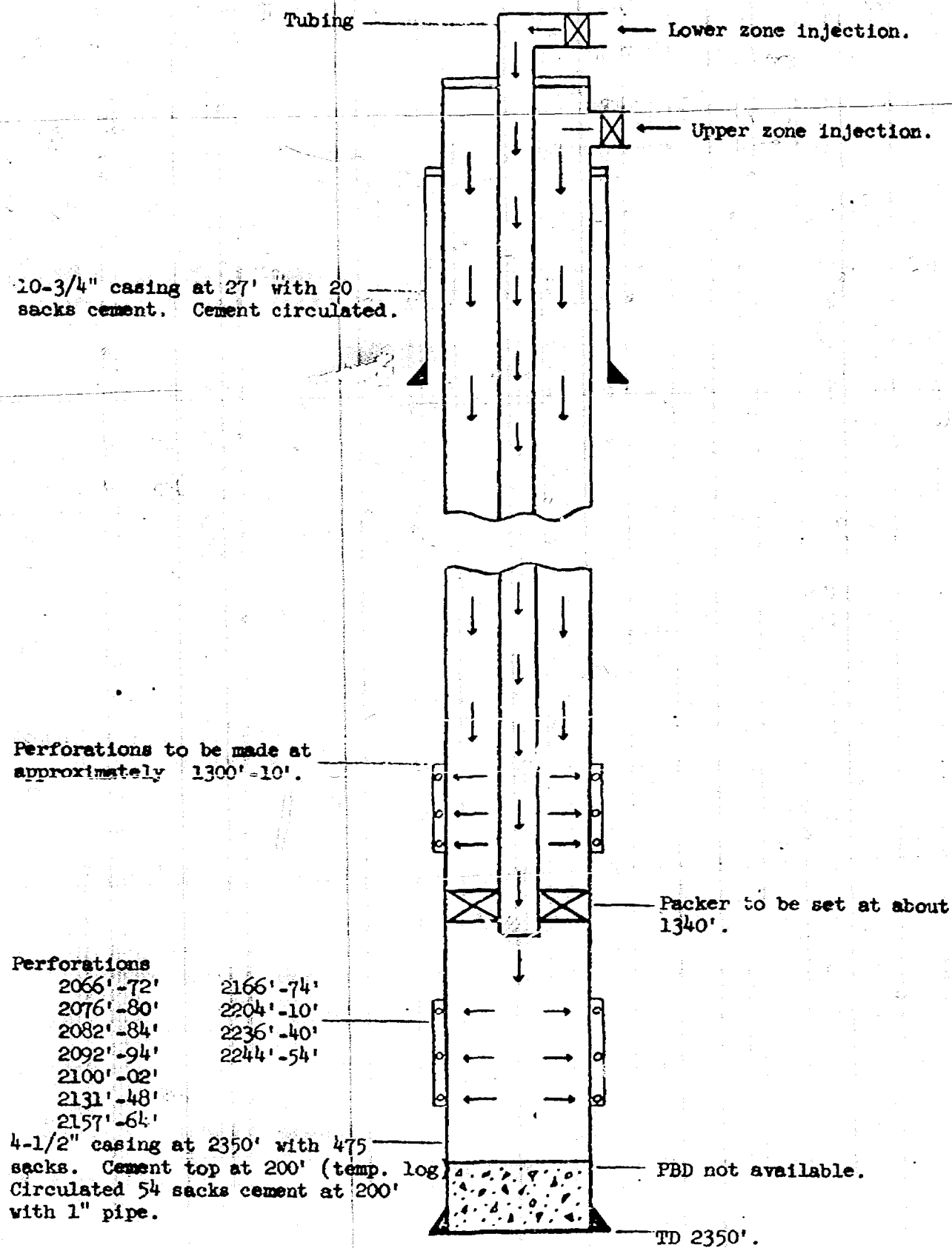
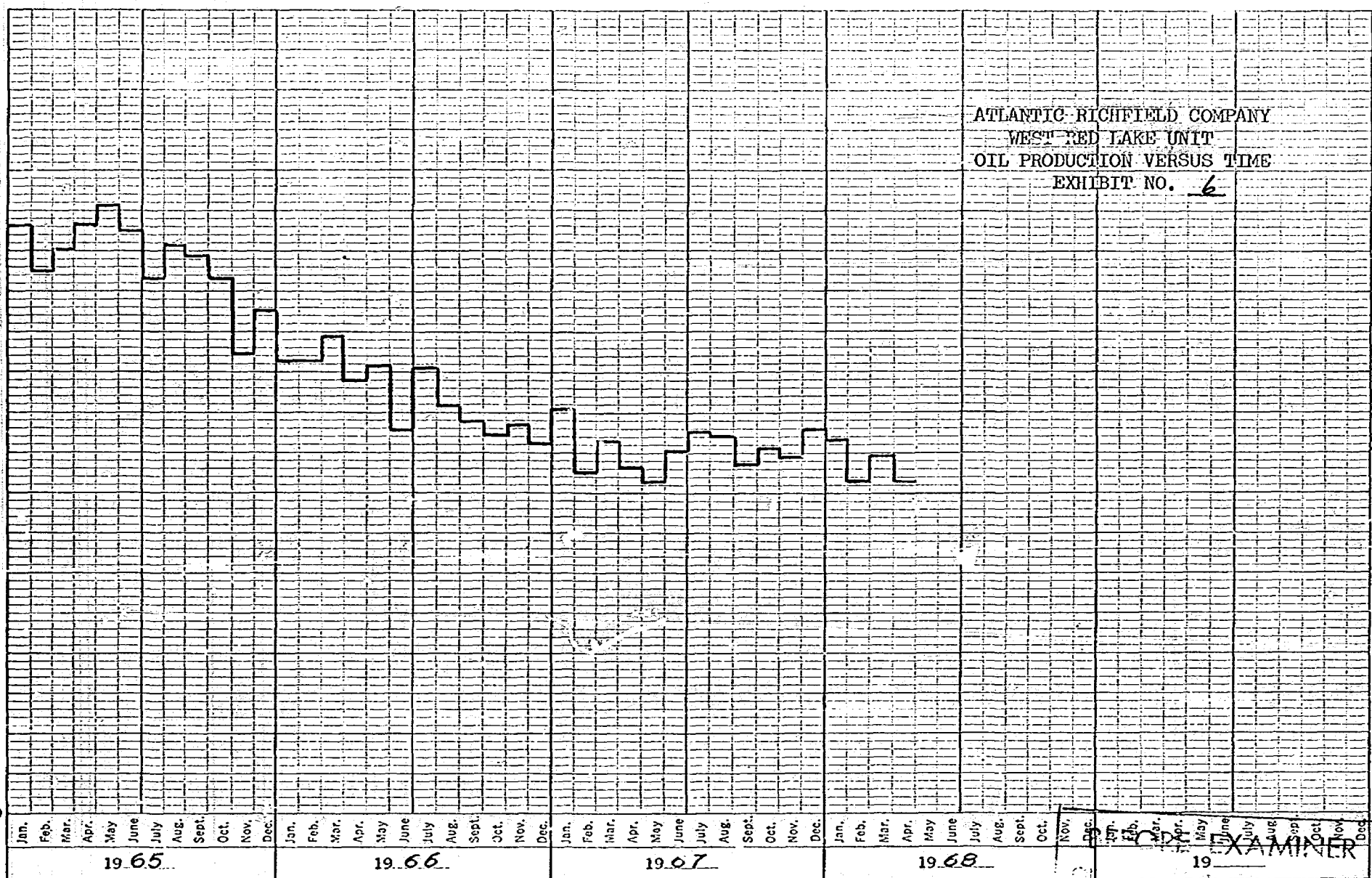


EXHIBIT NO. S-M

K&E 5 YEARS BY MONTHS 46 3650
X 100 DIVISIONS MADE IN U.S.A.
KUFFEL & LESSER CO.

Oil Production - M Bbl. Per Month



ATLANTIC-RICHFIELD COMPANY
WEST RED LAKE UNIT
OIL PRODUCTION VERSUS TIME
EXHIBIT NO. 6

Time (yrs.)

APPLICANT'S NO. 6
CASE NO. 3824

EXAMINER UTZ

BEFORE EXAMINER UTZ

Case NO. 3824

INITIAL PLAN OF DEVELOPMENT
WEST RED LAKE UNIT
JULY 16, 1968

The West Red Lake Unit is comprised of some 1,235.85 acres in Eddy County, New Mexico, unitized for the purpose of secondary recovery by waterflood. This area is contained in portions of Sections 4, 5, 6, 7, 8, and 9, Township 18 South, Range 27 East. Figure No. 1 shows the outline of this Unit and the applicable wells contained herein. Atlantic Richfield Company is operator of the Unit.

The zones to be flooded in the West Red Lake Unit are the Premier found at about 1,100 feet and the San Andres at about 1,600 feet. Type logs (Figs. 2 and 3) showing these zones are attached. The Premier zone (Fig. 2) is found to be present throughout the entire unit area, however, sand characteristics warranting primary development are localized. The Premier was thus developed only in the central part of Section 7 and the NE/4 of Section 8. Apparently the factor controlling production in all directions away from the Unit is loss of permeability as there is no known water contact in this area.

Production from the San Andres is limited on the south and east by water. On the north, water and poor permeability limited development of this zone. San Andres production from this structure continues to the west across the Pecos River into the Atoka Pool. As shown on Fig. 3, the San Andres zone in the unit area contains four productive stringers. These stringers apparently do not contain producible water in the unit area. A lower zone found at about 1730 feet on the type log is water productive in some portions of the Unit and will not be injected into.

It is believed that the relatively good sand characteristics of this zone would thief water if it were included in the injection interval. This zone will be left open in the producing wells and whatever reserves are present should be recovered by natural water influx.

The Premier zone is depleted in the unit area and a number of Premier wells have been temporarily abandoned. It is estimated that this zone produced about 170,000 barrels of oil on primary depletion.

The San Andres is presently producing about 140 BOPD and 170 BWFD. Cumulative production from this zone has been about 793,000 barrels of oil, making the total production from the unit area some 963,000 barrels. It is estimated that 120,000 barrels of primary production remain.

Secondary recovery is expected to yield from 400,000 to 600,000 barrels of oil in about 8 years, over and above that recoverable by primary means. The ultimate injection pattern to be used in the waterflood is shown on Figure No. 1. This development is essentially several peripheral patterns. The configuration of injection wells was necessary because of the relatively uneven well spacing and an attempt to utilize the wells in better mechanical condition as injectors.

Initially injection will begin into four unit wells in the Premier and Grayburg zones. These are as follows:

<u>Well</u>	<u>Location</u>
Vandagriff "C" No. 2	SE/4, NE/4 Section 7
Vandagriff "C" No. 3	NE/4, NE/4 Section 7
Sterling No. 4	SE/4 NW/4 Section 7
Gant Federal No. 2	NE/4, SE/4 Section 7

Because of the unknown injectivity of the Grayburg and particularly the Premier, where it was not developed for primary, these wells will be observed for a few months in order that the ultimate pattern can be evaluated and facilities more efficiently designed.

After gaining the needed information from the test, the injection pattern will be expanded to include all injectors shown on Figure No. 1, with the exception of the following wells:

<u>Well</u>	<u>Location</u>
Federal "EG" No. 1	NE/4 SW/4 Section 4
Mann Federal No. 2	NE/4 NW/4 Section 9

The Mann Federal No. 2 and the Federal "EG" No. 1 each produce considerable quantities of water. Further study will be given these wells to ascertain if a greater recovery can be attained by leaving the wells as producers and benefiting from the natural water influx.

It is estimated that ultimately 4000 BWPD will be injected into the project.

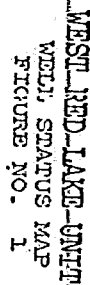
The typical injection well proposed mechanical setup is shown on Fig. 4. The injection stream will be split, metered and controlled at each injector so that injection into the Premier is down the casing tubing annulus and into the San Andres is down tubing below a packer. Splitting the injection stream in this manner will afford greater control of injection and a more efficient recovery of the secondary reserves.

The injection water will be purchased from Double Eagle Corporation. Atlantic has had experience with this water and finds it to be good quality. The water will be treated to assure a minimum amount of corrosion and frequent checks will be made to ascertain that control is maintained. Facilities for produced water gathering and reinjection will be constructed.

Fig. 1 also shows the wells that will be used for production. In general, all the producers will have the Premier and San Andres zones open together in the wellbore. In the northeast quarter of Section 8, two producing wells penetrated only the Premier and will serve only this zone.

Atlantic Richfield Company, as operator of the West Red Lake Unit, will act prudently to preserve all rights of the mineral owners and to effectively and efficiently recover the reserves in the unit area. This company will meet all economical offset obligations and act so as to prevent undue waste.

5376



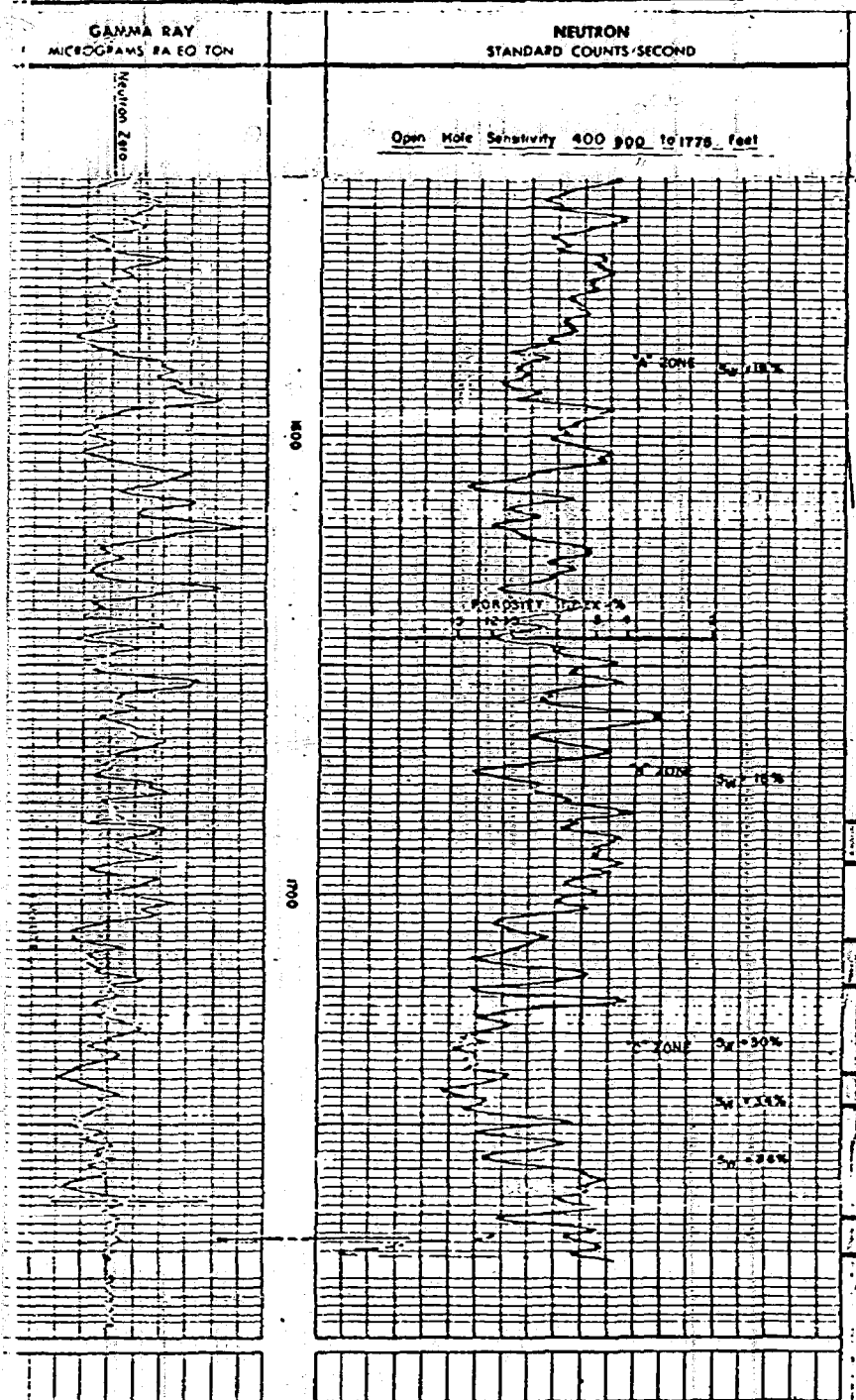
PREMIER ZONE

SCHEIDT & BENDER WELL SURVEYING CORPORATION

COUNTY <u>EL PASO</u> FIELD <u>WILLIAM STURLEY JR. #1</u> WELL <u>WILLIAM STURLEY JR. #1</u> COMPANY <u>WELLS FARGO BANK, INC.</u>	COMPANY <u>WELLS FARGO BANK, INC.</u> WELL <u>WILLIAM STURLEY JR. #1</u>	Other Surveys <u>LL</u>
	FIELD <u>RED LANE</u> LOCATION <u>SEC. 7-16S-27E</u>	Location of Well 2310' F.M. 1650' F.M.
	COUNTY <u>EL PASO</u> STATE <u>NEW MEXICO</u>	Elevation D.F. <u>3295.8</u> K.B. <u>3295.8</u> or G.C. <u>3295.8</u>
	FILING No. _____	
	Log Depths Measured From <u>KB</u> <u>8 Ft. above CL</u>	

RUN NO. <u>ONE</u> Date <u>7-6-57</u> First Reading <u>1775</u> Last Reading <u>0</u> Footage Measured <u>1775</u> Max. Depth Reached <u>1775</u> Bottom Diller <u>1775</u> Maximum Temp. <u>95</u> Fluid Nature <u>Salt Gel</u> Fluid Level <u>Surf.</u> Casing Size <u>6.5/8 in.</u> Casing Weight <u>10 lb.</u> Casing Size <u>10 in.</u> Casing Weight <u>10 lb.</u> Bit Size <u>7 1/2 in.</u> No. Counters Used <u>1</u> Type Equipment <u>GM-4</u> Type Panel <u>GM-4</u> Ovr. Rtg Time <u>2.5 sec.</u> Truck No. <u>1730 Artesia</u> Observer <u>Reid, KRS</u> Witness <u>Borden</u>	Log Depth Measured From <u>KB</u> <u>8 Ft. above CL</u>
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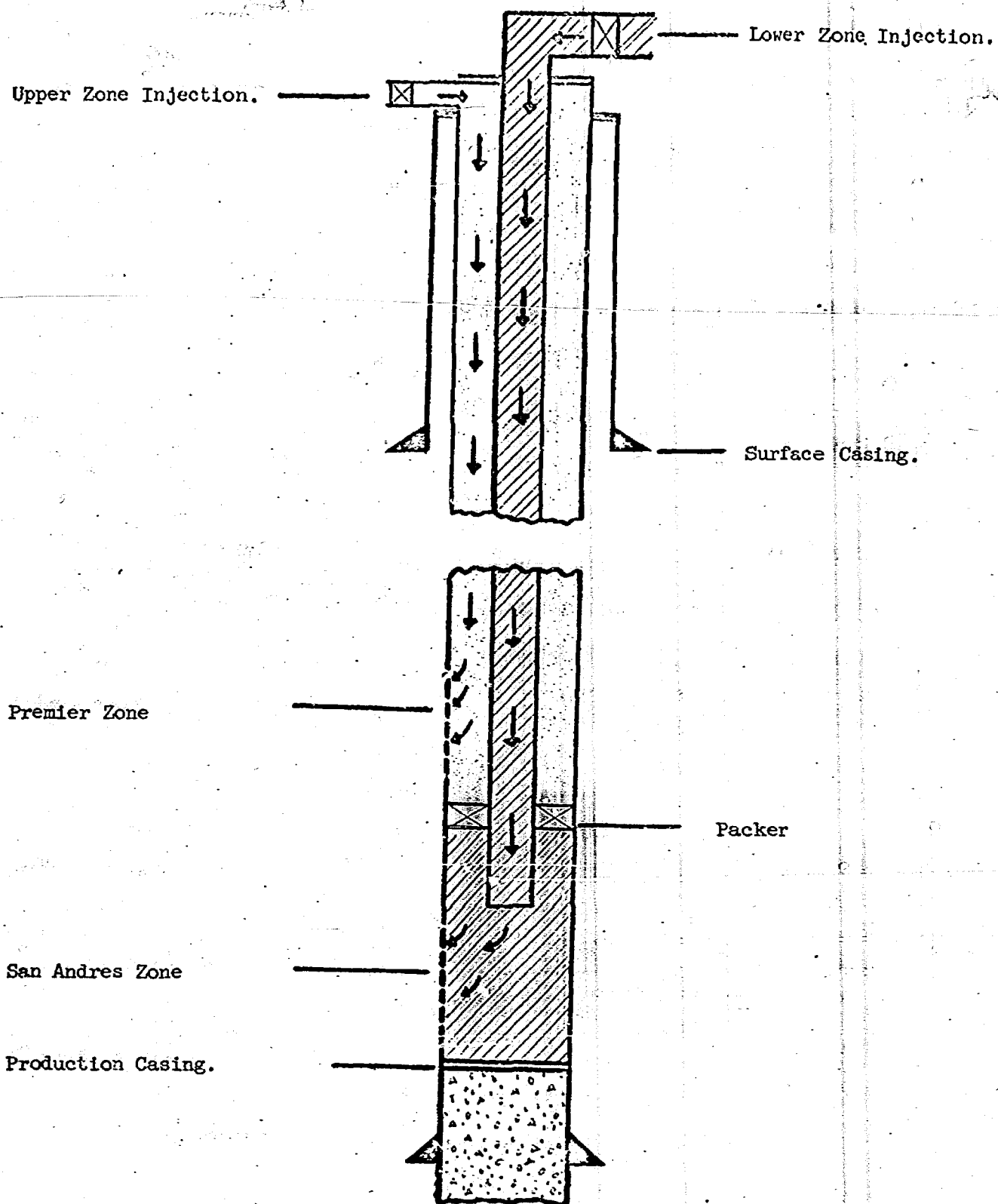
REMARKS	CAUSATION BACKGROUND CPS	TEST SOURCE CPS	GALV. INCREASE DIVISIONS	PANEL SENS. TAP. FOR CAL.
GAMMA RAY	140	500	100	600
NEUTRON	2	200	100	400



WEST RED LANE UNIT
TYPE LOG
SAN ANDRES ZONE

FIGURE NO. 3

SAN ANDRES ZONE



WEST RED LAKE UNIT
TYPICAL INJECTION WELL
SCHEMATIC DRAWING
FIGURE NO. 4