

CASE 4459: Appli. of CONTINENTAL  
OIL COMPANY FOR A WATERFLOOD  
PROJECT, LEA COUNTY, N. M.

Case. Number.

4459

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Application,

Transcripts.

Sm all Exhibts.

ETC.

ROUGH DRAFT FOR WATERFLOOD LETTERS

Mr. Jason Kellahin  
Kellahin & Fox  
Attorneys at Law  
Post Office Box 1769  
Santa Fe, New Mexico

Dear Sir:

*Refer to* Commission Order No. *recently* R-4068, entered in Case No. 4459, approving the *Continental Oil Company South Eastern* Waterflood Project.

*Injection shall be through the SDX Borehole No 1 located in Unit A of S 20, T 22 S, R 36 E, with injection in the project to be accomplished through cement-lined tubing set in a jacket. The jacket is located as near as is practicable to the uppermost perforation.*  
*Injection* All wells except the *mainly completed* H.D. Borehole No 1 located in Unit K of S 21, T 22 S, R 36 E, shall be single completions and shall have the necessary annulus loaded with an inert fluid and equipped with a pressure gauge at the surface. The perforations above the project.  
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 2688 barrels per day when the Southeast New Mexico normal unit allowable is 42 barrels per day or less.

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

cc: OCC: Hobbs X  
Artesia       
Aztec     

USGS Hobbs

Mr. Frank Irby, State Engineer Office, Santa Fe, New Mexico

Mr. D. E. Gray

*in the SDX Borehole No 1 located in Unit A of S 20, T 22 S, R 36 E, and the Continental "D" Borehole No 1-D, located in Unit D of S 21, T 22 S, R 36 E, shall be squeezed prior to placing said water on injection.*

*These operations must be done with a 4000 psi pump with pressure gauge for 4000 psi and with a 4" section 25' and 1/2" diameter*

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BEFORE THE  
NEW MEXICO OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico  
November 18, 1970

EXAMINER HEARING

IN THE MATTER OF:

Application of Continental Oil  
Company for a unit agreement, Lea  
County, New Mexico.

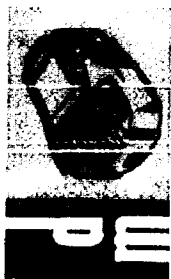
Application of Continental Oil  
Company for a waterflood project,  
Lea County, New Mexico.

Case 4458

Case 4459

BEFORE: Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING



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I N D E X

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MR. UTZ: Case 4458.

MR. HATCH: Case 4458. Application of Continental Oil Company for a unit agreement, Lea County, New Mexico. Do you want Case 4459 called too?

MR. KELLAHIN: Let's consolidate them for the record with separate Orders.

MR. UTZ: Request has been made for consolidation for the purpose of testimony of Cases 4458 and 4459. We'll consolidate these cases for purpose of testimony with separate Orders to be written on the cases.

MR. KELLAHIN: If the Examiner please, Jason Kellahin, Kellahin and Fox, appearing for the Applicant. We have one witness I'd like to have sworn.

(Witness sworn.)

VICTOR T. LYON

called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A Victor T. Lyon, L-Y-O-N.

Q And you're the same Mr. Lyon who testified before this Commission this morning and made your qualifications

of record; is that correct?

A That is correct.

Q Are you familiar with the Application of Continental Oil Company in Cases 4458 and 4459 presently before the Examiner?

A Yes, sir.

Q Briefly, what is proposed by the Applicant in these two cases?

A Case Number 4458 is the Application of Continental Oil Company for approval of the South Eunice Unit Agreement and Case Number 4459 is Application for Continental for authority to install and operate a waterflood project in the South Eunice Pool within the boundary of that unit.

MR. UTZ: Excuse me just a moment, Mr. Kellahin. I didn't ask for other appearances. Are there any? There are none? You may proceed.

Q (By Mr. Kellahin) Mr. Lyon, directing your attention to what has been marked as Applicant's Exhibit No. 1, would you identify that Exhibit, please?

A Yes, sir. Exhibit No. 1 is a copy of the unit agreement for the South Eunice Unit. It is a modified federal form, and I should like to direct the Examiner's attention to a few of the provisions. Section Two on Page Two defines the

unit area which is also shown on Exhibit "A" and comprises 2720 acres described as the East half of the East half of Section 20, all of Section 21, the South half of the North half, Northwest quarter of the Northwest quarter, and Northwest quarter of the Northeast quarter, Section 22, all of Section 28, East half of the Northeast quarter and the Northeast quarter of the Southeast quarter, Section 29 North half, Southeast quarter, North half of Southwest quarter and Southeast quarter of the Southwest quarter. Section 33. All in Township 22 South, Range 36 East.

Q Does the unit agreement define the unitized formations?

A Yes, sir. The unitized formation is defined in Paragraph "F" of Section Two on Page Three, and it is defined as the interval between the base of the Queen and a point 232 feet above the top of the Queen, with a further provision that it shall not extend below a depth of 4,000 feet from the surface of the ground. The top and base of the Queen are shown on what we have designated, Exhibit No. 3, which will be discussed later.

Now, the South Eunice Pool as defined by the Oil Conservation Commission consists of the Queen formation and the lower 100 feet of the Seven Rivers. Therefore, the

unitized formation as we have defined it herein extends 132 feet above the top of the South Eunice Pool boundaries. It was necessary to do this in order to include all of the perforations in the oil wells which will be a part of the unit area.

MR. UTZ: Just a moment. Base of the Queen, and where did the 232 come in now?

A 232 feet above the top of the Queen.

MR. UTZ: Okay.

Q (By Mr. Kellahin) Are all of the substances unitized in this interval?

A No, sir. In Paragraph "G", we have defined unitized substances as being the oil gas, gaseous substances, et cetera, produced from the land, but it specifically excludes dry gas and associated hydro carbons so that we have -- that is from Jalmat gas wells so that we have excluded Jalmat gas wells within the unit area.

Q But you do include all of the oil produced from the South Eunice Pool?

A Yes, sir.

Q Is that correct? And from the lower limits of the Jalmat Oil Pool?

A That is correct.

Q Now, is there a provision in the unit agreement for future expansion?

A Yes, there is.

Q Would you discuss that, please?

A Yes, sir. This is Section Four, it provides for the manner in which the unit can be expanded. This is more or less standard language.

Q And is Continental Oil Company, the Applicant here, designated as a unit operator?

A Yes, sir. In Section Six Continental is operated as a unit operator. Section Seven provides for the resignation or removal of the unit operations. Section Eight provides for a successor unit operator, and these again, are standard provisions.

Q Well, what is the tract participation in this unit?

A Section 13 provides for the basis of tract participation. There are two phases in this formula. Phase One extends from the effective date until 116,910 barrels of oil have been produced from the unit area after October 1st, 1968. Participation during this phase is based 100 percent on tract current revenue as defined in Section Two. In Phase Two, participation is based on a formula 55 percent tract ultimate primary oil production plus 55 percent usable wells, plus 5

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percent tract remaining gas value and 5 percent acreage.

Q Well, how will the tracts qualify in this unit?

A The qualification of tracts is set out in Section 14. And this, again, is standard language and under the provisions of this Section we have 96.81 percent in Phase One and 97.52 percent in Phase Two of the working interzoners, having ratified the agreement. Ratifications have been signed by the Royalty and Overriding Royalty interest as follows:

In Tract One, 100 percent of the Royalty and 95.8 percent of the Overriding Royalty. Tract Two, 100 percent of the basic Royalty. Tract 2A, 100 percent of the basic royalty. Tract 3, 64.05 percent of the basic royalty. Tract 4, 85.82 percent of the basic royalty and if I do not mention overriding royalty, this means that there is no overriding royalty in the tract. Tract 5, 78.47 percent of the basic royalty. Tract 6, 92.36 percent of the basic royalty. 6-A, 60.34 percent of the basic royalty. 7, 95.13 percent of the basic royalty, and 100 percent of the overriding royalty. Tract 8, 54 percent of the basic royalty, within 100 percent of the overriding royalty. Tract 9, 82.4 percent of the basic royalty. Tract 10, 99.79 percent of the basic royalty. Tract 10-A, 87.5 percent of the basic royalty. Tract 10-B, 24.72 percent of the basic royalty. Tract 10-C, 87.24 percent of the basic royalty.

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Tract 11, 82.83 percent of the basic royalty, 100 percent of the overriding royalty. Tract 12, 100 percent of the basic royalty and 80 percent of the overriding royalty. Tract 13, 87.36 percent of the basic royalty and 100 percent of the overriding royalty. Tract 14, 98.44 percent of the basic royalty and 100 percent of the overriding royalty. Under the provisions of this Section, all tracts except 3, 6-A, 8, 10-B, 11, 13 and 14 are qualified for participation. And we have contacted sufficient numbers of the parties that we're confident that all tracts will be qualified for participation by January 1st, 1971.

Q Is the ownership reflected in the usual fashion on Exhibit "B" of this --

A Yes, sir.

Q -- unit agreement?

A Exhibit "B" shows the new ownership of the tracts within the unit area.

Q Now, what acreage and percentages are Federal, State and fee lands?

A The unit area includes 1,040 acres of Federal land, which is 38.24 percent of the unit area and 680 acres of Federal land, which is 61.76 percent of the unit area. There is no State land within the unit area.



Q Now, referring to what has been marked as Exhibit No. 2, would you identify that Exhibit?

A Exhibit No. 2 is a location and ownership plat showing the proposed unit area and an area two miles in radius surrounding the unit area. The wells within the unit area are designated as to the pool from which they are producing by a letter symbol, the legend for which appears at the bottom of the Exhibit. The South Eunice Wells do not have any letter symbols, so those wells which don't have a symbol are South Eunice Wells.

Q Now, the outline of the unit is shown with a dotted line, is that correct?

A Yes, sir.

Q And within that unit area are there some Jalmat Wells?

A Yes, sir, there are some Jalmat Oil Wells, one located in Unit "E" and one Unit "N" of Section 22. There is a dual completion in Unit "K" of Section 21.

Q Will that be used in connection with the unit operations, that dual completion?

A Yes, sir.

Q The South Eunice completion will be used as an injection well. There is also a well in Unit "J" of Section 33, which -- these wells that I have discussed are Jalmat Oil



Wells which produced from the Yates formation. Consequently, they are not included within the unitized interval and will not be unitized. Now, the well in Unit "L" of Section 33, which is Continental Oil Company's Mira B 33 No. 9 is completed in the lower Seven Rivers and will be used as an injection well, because it is in fresh communications with the zones which are being waterflooded.

Q Now, referring to what has been marked as Exhibit No. 3, would you identify that?

A Yes, sir. Exhibit No. 3 is the copy of Gamma Ray Sonic Log which was run in the Continental Oil Company West Area Deep Well No. 1. This is the type log which I introduced before. It shows the tip of the Queen as 3821, the base of the Queen at almost 4,023 feet. Therefore, the unitized interval would extend in this well, if it were in the unit. Now, I might point out that it is located three-fourths of a mile northwest of the unit area. Would be 232 feet above the top of the Queen or 3,589 is what it ought to be. However, if this well were in the unit area, the unitized formation would be cut off at 4,000 feet because of this provision in the unit agreement. I might point out that there is no well within the unit area which has penetrated as deep as 4,000 feet, and we do not anticipate deepening any wells to that depth. So we don't believe that



this restriction will give us any problem.

Q Would you discuss the next series of Exhibits marked Exhibits 4-1 through 4-30, inclusive, as a group, pointing out any particular differences that should be brought to the attention of the Examiner.

A We attached to the Application a list of the injection wells, which we designated Exhibit 4. That tabulation showed the size setting depth, amount of cement used, etcetera, on the surface casing, the intermediate casing, if any, and the production casing. These diagrams show the same information plus the producing interval, the approximate location of setting the packer, the description of the tubing which will be in all cases, I believe, two and three-eighths-inch cement lined tubing with a Baker Model A equivalent tension-type-retrievable-production packer.

*mont*  
Q Will you fill the casing tubing length, with an inner fluid?

A Yes, we will.

Q And will you put a pressure gauge at the surface?

A Yes, sir.

Q Now, directing your attention to Exhibit 4-7.

A Yes, sir.

Q Now, that is a dual completion; is it not?



A Correct.

Q Would you --

A This is the schematic diagram of the Gulf Greer No. 1, which is a dual completion. We'll install the cement-lined tubing in this well as were the others, but because of the fact that it is a dual completion and produces Jalmat gas above the packer, we, of course, will not install or will not put an inner fluid in that well.

Q Is this a type of completion that has been used for injection purposes successfully elsewhere?

A Yes.

Q And has been approved by this Commission in other cases?

A Yes.

Q And as to all of the other wells, they will be completed as you described?

A Yes, sir.

Q And that is a type of completion that has been approved by this Commission --

A Yes, sir.

Q --in other cases?

Now, directing your attention to Exhibits 5-1 through 5-30, would you discuss that series of Exhibits?

A Exhibits 5-1 through 5-30 are copies of the logs which are available on the wells. They are a major size on a scale one-inch to one hundred feet. We do not have logs available on all wells. Consequently, there is no Exhibit 5-4, 5-23 or 5-25. Now, let me explain that I have numbered these Exhibits in the second number following the hyphen. In the same sequence that Exhibits 4-1 through 4-30 so that you can cross refer to them. I have shown on these by a horizontal red line the top of the Yates, which is the uppermost horizontal red line, the top of the Seven Rivers and the top of the Queen. Exhibits 5-5, 5-26, and 5-30, do not show the top of the Queen since that formation was not penetrated in those wells. Conversely, Exhibits 5-27 and 5-28 do not show the top of the Yates, as it is covered up by the log heading.

Q Now, referring to Exhibits No. 6, would you identify that Exhibit?

A Exhibit No. 6 is a structure map on the top of the Queen formation with a contour interval of 20 feet. The South Eunice Pool occurs in a terrace-like situation on the West flank of a tremendous North-South trending anticline. You will note that there is a sink in the Western or the Southwestern portion of Section 22. Then there is a

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ridge in the Northwestern portion of the Exhibit and another high area to the Southeast in the Southeast portion of the Exhibit. That Northeast portion and the Southwest portion are low areas, so there is a trough trending from northeast to Southwest which is in the nature of an embankment on this anti-climb. The oil occurs in the several members predominately by their relationship to sea level between a minus 300 and up to approximately a minus 100.

Q Now, do these sums appear to be continuous throughout the unit area?

A Yes.

Q Will they be capable of transmitting fluid from one well to another?

A Yes, all the information we have indicates that they will.

Q On that basis it would be possible to successfully waterflood the unit area?

A We believe that waterflooding can be carried out successfully.

Q Basically, what does the pay zone consists of here?

A It is primarily a fine grained sand interbedded with dense dolomite.

Q Now, referring to Exhibit No. 7, would you

identify that Exhibit, please?

A Exhibit No. 7 is a plat showing our proposed injection pattern. It is essentially an 80-acre-five-spot pattern modified as necessary. For instance, on the Southwest portion to supplement very slight water influx, which had occurred there and in other places, due to the pattern in which wells have been drilled.

Q Now, to complete your pattern, it will be necessary to drill two additional wells, will it not?

A Yes, provided that the project proceeds as we hope that it will. Final decision to drill these wells will be determined by the performance of the flood.

Q Now, is this area offset by production, the unit area offset to the east, by production?

A Yes.

Q Is that being unitized?

A In Section 27 and 28 there is a group of Atlantic Richfield Leases which are being unitized, and we have initiated negotiations for a lease-line agreement with them.

Q You anticipate that that will be completed?

A Yes.

Q And is there any necessity for a lease-line agreement anywhere else offsetting this waterflood project?

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A There is no development to the East, that is East of Section 22. The development North is so scant that we have no hope of negotiating any lease-line agreements there, because there is no way that they could reciprocate. We have called Marathon's attention to the fact that we are proposing this, and they have offered no objection to our converting these wells to injection. Of course, there is no production to the West.

Q Now, referring to Exhibit No. 8, would you identify that Exhibit?

A Yes, sir. Exhibit No. 8 is a data sheet giving pertinent data on the unit area and the performance and our -- in essence, the result of our calculations on a waterflood.

Q Now, is this area at an advanced stage of depletion?

A Yes, sir.

Q Is it ready --

A The current daily oil production, or at least the production for August of 1970 was 1.5 barrels of oil per day, 1.6 barrels of water per day. Gas-oil ratio is 23,000.

Q What was the cumulative production?

A Cumulative production to September 1st of 1970 was 3,135,218 barrels.

Q Do you estimate that additional production of oil will be achieved by a waterflood project?

A We estimate that an additional 3,310,000 barrels can be recovered by waterflooding in this unit area.

Q Now, is that in the interest of conversation and the prevention of waste?

A Yes, sir. In my opinion, it is.

Q In referring to Exhibit No. 9, would you identify that Exhibit, please?

A Yes, sir. Exhibit No. 9 is a copy of a water analysis of water which we believe to be typical of what we'll be using for injection water. This actually came from our Lynn "A" Lease approximately three miles to the South. But as you can see, the solids are quite low. So we believe this is typical of the water.

Q Well, where do you propose to get your water?

A The water is supposed -- I mean, we anticipate developing the Jalmat Section in leases which are immediately adjacent to the West of the unit area and it will be water we expect to be produced with oil from the Jalmat Pool.

Q Would that be Seven Rivers Reef water?

A Yes, sir.

Q And if necessary, would you drill additional wells

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for the production of water --

A If it's necessary.

Q --to carry on this flood?

A Yes.

Q Do you have any estimate on the amount of water that will be injected?

A We expect to inject a maximum of 13,000 barrels per day into the 30 injection wells, and we think that the maximum injection pressure will be in the order of 1500 pounds.

Q And would the completion as you propose for your injection wells be able to handle that pressure without any danger?

A Yes.

Q Do you request an administrative procedure for adding or substituting injection wells in this waterflood project?

A Yes, sir. Referring back to Exhibit No. 7, I believe it is, the irregularities of the unit boundary and some of the locations of the wells indicate that there may be some reason to modify this injection pattern, and we would like to have administrative procedures in the order for substituting or adding injection wells.

Q Would they be at similar locations or would the location also be a factor?

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A I'm sorry. I didn't understand you.

Q Would the location of your injection wells be a factor? I mean, would they be a similar location to those proposed or would you have them closer to the lease, the quarter-section lines or farther away?

A As we contemplate it now, they would be more standardized, more in the center of the quarter quarter section. We do not anticipate at this time that there would be any non-standard locations used for injection.

Q Turning back to the unit agreement, has that been submitted to the Department of the Interior for approval?

A Yes, it has. It has been submitted to them for preliminary approval and this approval was given -- I forget the exact date. I believe it was February 27th, 1970. I mean February 25th.

Q And there being no State land, no approval of the State Land Commissioner is required?

A That is correct.

Q Were Exhibits 1 through 9, including the multiple Exhibits 4 and 5, prepared by you or under your supervision?

A Yes, they were.

Q At this time I would like to offer into evidence the Exhibits in this case.

MR. UTZ: Without objection Exhibits 1 through 9

will be entered into the record in this case.

MR. KELLAHIN: That completes the Direct testimony.

MR. UTZ: Mr. Lyon, you submitted with your Application a list of 30 wells for which you seek approval?

A Yes, sir.

MR. UTZ: Do you have any changes in the locations or descriptions of those wells, that you know of?

A No, not that I know of.

MR. UTZ: In other words, do you vouch for their accuracy?

A Well, they are accurate to the best of my ability. I won't swear that there aren't some typographical errors, but I have not come across any.

MR. UTZ: The only deviation from your method of completing your injection well is the one well shown by Exhibit 4057?

A That is correct.

MR. UTZ: Questions of the witness?

MR. HATCH: Now, the two wells shown on Exhibit 7 to be drilled, they are not part of that 30?

A No.

Q They would other --

A No, they would be in addition to the 30 that we have.

MR. UTZ: Other questions? The witness may be excused.

The case will be taken under advisement. We'll take a short recess.

STATE OF NEW MEXICO )  
 ) ss  
 COUNTY OF BERNALILLO )

I, LINDA MALONE, Court Reporter 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.

Linda Malone  
 COURT REPORTER

I do hereby certify that the foregoing is  
 a complete record of the proceedings in  
 the Bernalillo hearing of case #44-5884459  
 heard by the New Mexico Oil Conservation Commission  
Linda Malone Reporter  
 New Mexico Oil Conservation Commission



## OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

P. O. BOX 2088 - SANTA FE

87501

GOVERNOR  
DAVID F. CARGO  
CHAIRMAN

LAND COMMISSIONER  
ALEX J. ARMIJO  
MEMBER

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

December 1, 1970

Mr. Jason Kellahin  
Kellahin & Fox  
Attorneys at Law  
Post Office Box 1769  
Santa Fe, New Mexico

Re: Case No. 4459  
Order No. R-4068  
Applicant:  
Continental Oil 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

Copy of order also sent to:

Hobbs OCC X

Artesia OCC       

Aztec OCC       

State Engineer X

Other U. S. Geological Survey, Box 1838, Hobbs, New Mexico 88240

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

February 9, 1971

Mr. Jason Kellahin  
Kellahin & Fox  
Attorneys at Law  
Post Office Box 1769  
Santa Fe, New Mexico

Dear Sir:

Reference is made to Commission Order No. R-4068, recently entered in Case No. 4459, approving the Continental Oil Company South Eunice Unit Waterflood Project.

Injection shall be through the 30 authorized water injection wells, with injection in each well to be accomplished through cement-lined tubing set in a packer. Packers shall be located as near as is practicable to the uppermost perforation. All injection wells except the dually completed H. D. Greer Well No. 1, located in Unit K of Section 21, Township 22 South, Range 36 East, shall be single completions and shall have the casing-tubing annulus loaded with an inert fluid and equipped with a pressure gauge at the surface. The perforations above the packer in the SDX Boren Well No. 1 located in Unit A of Section 20, Township 22 South, Range 36 East, and the Continental Christmas "D" Well No. 1-D located in Unit O of Section 21, Township 22 South, Range 36 East, shall be squeezed prior to placing said wells on injection.

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 2688 barrels per day when the Southeast New Mexico normal unit allowable is 42 barrels per day or less. This allowable would increase to 2772 barrels when the two injection wells planned later for Unit O of Section 28 and Unit A of Section 33 are drilled.

OIL CONSERVATION COMMISSION

P. O. BOX 2088

SANTA FE, NEW MEXICO 87501

-2-

Mr. Jason Kellahin - February 9, 1971

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.

C 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.

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

P Very truly yours,

A. L. PORTER, Jr.  
Secretary-Director

Y ALP/DSH/ir

cc: Oil Conservation Commission  
Hobbs, New Mexico

U. S. Geological Survey  
Post Office Box 1838  
Hobbs, New Mexico

Mr. D. E. Gray  
State Engineer Office  
Capitol Building  
Santa Fe, New Mexico

Docket No. 25-70

DOCKET: REGULAR HEARING - WEDNESDAY - NOVEMBER 18, 1970

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

**ALLOWABLE:** Consideration of the allowable production of gas for December, 1970, from fifteen prorated pools in Lea, Eddy, Roosevelt and Chaves Counties, New Mexico, and also presentation of purchaser's nominations for said pools for the six-month period beginning January 1, 1971. Consideration of the allowable production of gas from nine prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico, for December, 1970.

**CASE 4453:** In the matter of the hearing called by the Oil Conservation Commission on its own motion to consider the promulgation of an order prohibiting the flaring or venting of casinghead gas in the State of New Mexico on or after December 31, 1970, when certain conditions exist. Copies of the proposed order will be circulated by way of the Commission's general mailing list and will be available upon request made to the Commission at its Santa Fe office.

\* \* \* \* \*

THE FOLLOWING CASES WILL BE HEARD BEFORE DANIEL S. NUTTER, EXAMINER, OR ELVIS A. UTZ, ALTERNATE EXAMINER, IN THE OIL CONSERVATION COMMISSION CONFERENCE ROOM ON THE SECOND FLOOR OF SAID BUILDING AT 9:30 A.M.

**CASE 4454:** Southeastern New Mexico nomenclature case calling for the extension of certain pools in Lea, Chaves and Roosevelt Counties, New Mexico.

(a) Extend the Baum-Upper Pennsylvanian Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 14 SOUTH, RANGE 32 EAST, NMPM  
SECTION 11: N/2 and SW/4

(b) Extend the Double L-Queen Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 14 SOUTH, RANGE 30 EAST, NMPM  
SECTION 31: SE/4

(c) Extend the Maljamar Grayburg-San Andres Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 17 SOUTH, RANGE 33 EAST, NMPM  
SECTION 27: SE/4

(d) Extend the North Vacuum-Abo Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 17 SOUTH, RANGE 34 EAST, NMPM  
SECTION 14: NW/4  
SECTION 27: NE/4

(e) Extend the Vada-Pennsylvanian Pool in Roosevelt County,

(Case 4454 continued)

New Mexico, to include therein:

TOWNSHIP 8 SOUTH, RANGE 35 EAST, NMPM  
SECTION 33: NE/4

- CASE 4455: In the matter of the hearing called by the Oil Conservation Commission for the creation of a new oil pool and for the assignment of a discovery allowable, Sandoval County, New Mexico. The Commission, at the request of Refiners Petroleum Corporation, will consider the creation of a new oil pool for the production of oil from the Dakota formation comprising the NE/4 of Section 25, Township 22 North, Range 3 West, Sandoval County, New Mexico, said pool having been discovered by said corporation's Cuba Union Well No. 1 located in Unit A of said Section 25. Also to be considered will be the assignment of approximately 34,390 barrels of discovery allowable to said well.
- CASE 4456: Application of Pan American Petroleum Corporation for expansion of pressure maintenance project, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks authority to expand its Cato Baskett Pressure Maintenance Project, Cato-San Andres Pool, by the conversion to water injection of its Baskett "D" Wells Nos. 1 and 2, located respectively, in Units G and A of Section 11, Township 8 South, Range 30 East, Chaves County, New Mexico.
- CASE 4457: Application of Tenneco Oil Company for the creation of a new pool, assignment of discovery allowable, and promulgation of special pool rules, McKinley County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new pool for the production of oil from the "D" zone of the Dakota formation for its Don Ne Pah Well No. 1 located in Unit D of Section 18, Township 17 North, Range 8 West, McKinley County, New Mexico, and for the assignment of an oil discovery allowable to said well. Applicant further seeks the promulgation of special rules for said pool, including provisions for 80-acre spacing units with wells to be drilled in either the northwest or southeast quarter-quarter sections.
- CASE 4458: Application of Continental Oil Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the South Eunice Unit Area comprising 2720 acres, more or less, of Federal and Fee lands in Sections 20, 21, 22, 28, 29, and 33, Township 22 South, Range 36 East, South Eunice Pool, Lea County, New Mexico.
- CASE 4459: Application of Continental Oil Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in its South Eunice Unit Area by the injection of water into the Seven Rivers and Queen formations through 30 wells located in Sections 20, 21, 22, 28, 29, and 33, Township 22 South, Range 36 East, South Eunice Pool, Lea County, New Mexico.
- CASE 4460: Application of Continental Oil Company for a non-standard gas proration unit, Lea County, New Mexico. Applicant, in the above-styled cause,

(Case 4460 continued)

seeks the consolidation of two existing non-standard gas proration units into one 480-acre non-standard unit comprising the N/2 and SE/4 of Section 23, Township 22 South, Range 36 East, Jalmat Gas Pool, Lea County, New Mexico, to be dedicated to its Meyer B-23 Wells Nos. 1, 2, and 3, located in Units C, O, and E, respectively, of said Section 23. Applicant further seeks authority to produce the allowable from any of said wells in any proportion.

CASE 4461: Application of Continental Oil Company for a non-standard gas proration unit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the consolidation of two existing non-standard gas proration units into one 120-acre non-standard unit comprising the E/2 SW/4 and NW/4 SE/4 of Section 9, Township 21 South, Range 37 East, Blinebry Gas Pool, Lea County, New Mexico, to be dedicated to its Hawk B-1 Wells Nos. 2 and 6, located in Units J and N, respectively, of said Section 9. Applicant further seeks authority to produce the allowable assigned to said unit from either of said wells in any proportion.

CASE 4462: Application of Continental Oil Company for downhole commingling, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks authority to commingle production from an undesignated Gallup oil pool and undesignated Dakota oil pool in the wellbores of four wells to be drilled in Township 25 North, Range 4 West, West Lindrith Field, Rio Arriba County, New Mexico, as follows:

Jicarilla 22 Well No. 5 - Unit L - Section 22  
Jicarilla 28 Well No. 9 - Unit A - Section 28  
Jicarilla 28 Well No. 10 - Unit L - Section 28  
Jicarilla 28 Well No. 11 - Unit B - Section 33

CASE 4463: Application of Roger C. Hanks for compulsory pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Pennsylvanian formation underlying the NE/4 of Section 18, Township 9 South, Range 36 East, Vada-Pennsylvanian Pool, Lea County, New Mexico, said acreage to be dedicated to applicant's Ford Federal Well No. 1 located in the NW/4 NE/4 of said Section 18. Also to be considered will be the costs of drilling said well, a charge for the risk involved, a provision for the allocation of actual operating costs, and the establishment of charges for supervision of said well.

CASE 4451: (Readvertised)

Application of Union Oil Company of California for a non-standard oil proration unit, Roosevelt County, New Mexico. Applicant, in the above-styled cause, seeks approval for an 80-acre non-standard oil proration unit comprising the SW/4 SE/4 of Section 17 and the NW/4 NE/4 of Section 20, Township 8 South, Range 38 East, Bluitt-San Andres Associated Pool, Roosevelt County, New Mexico, to be dedicated to a well to be drilled at a standard location in the NW/4 NE/4 of said Section 20.

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CASE 4464: Application of Pan American Petroleum Corporation for authority to over-produce a gas well's allowable, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks authority to over-produce the allowable of its Gallegos Canyon Unit Well No. 185, located in Unit B of Section 33, Township 28 North, Range 12 West, Basin-Dakota Pool, San Juan County, New Mexico, in the amount of 19,311 MCF. According to applicant, this amount of gas, produced by other wells in the Gallegos Canyon Unit and with royalty and taxes already paid, was injected into the subject well to create a reservoir back-pressure prior to fracturing on work-over. Applicant seeks authority to produce, without being subject to allowable, royalty, or taxes, the volume of gas injected into the well.

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. 4459  
Order No. R-4068

APPLICATION OF CONTINENTAL OIL COMPANY  
FOR A WATERFLOOD PROJECT, LEA COUNTY,  
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9:30 a.m. on November 18, 1970, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 1st day of December, 1970, 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, Continental Oil Company, seeks authority to institute a waterflood project in the South Eunice Unit Area, South Eunice Pool, by the injection of water into the Seven Rivers and Queen formations through 30 injection wells in Sections 20, 21, 22, 28, 29, and 33, Township 22 South, Range 36 East, NMPM, Lea County, New Mexico.

(3) That the applicant further seeks an administrative procedure whereby said project could be expanded to include additional injection wells in the area of the said project as may be necessary in order to complete an efficient injection pattern; that said administrative procedure should provide for administrative approval for conversion to water injection in exception to the well response requirements of Rule 701 E-5 of the Commission Rules and Regulations.

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Order No. R-4068

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

(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; provided however, that the showing of well response as required by Rule 701 E-5 should not be necessary before obtaining administrative approval for the conversion of additional wells to water injection.

IT IS THEREFORE ORDERED:

(1) That the applicant, Continental Oil Company, is hereby authorized to institute a waterflood project in the South Eunice Unit Area, South Eunice Pool, by the injection of water into the Seven Rivers and Queen formations through the following-described 30 wells in Township 22 South, Range 36 East, NMPM, Lea County, New Mexico:

Company	Lease	Well No.	Unit	Section
Sun DX	- D. B. Boren	1	A	20
Millard Deck	- Lamar Lunt	1	I	20
Sun DX	- H. D. Greer	1	C	21
Sun DX	- H. D. Greer	4	E	21
Shell Oil Company	- D. Christmas	1	A	21
Shell Oil Company	- D Christmas	3	G	21
Gulf Oil Corporation	- H. D. Greer	1	K	21
	(to be dually completed)			
Gulf Oil Corporation	- H. D. Greer	3	M	21
Continental Oil Company	- Christmas D	1-D	O	21
Skelly Oil Company	- Christmas "C"	1	I	21
Sun Oil Company	- H. S. Record	6	E	22
Sun Oil Company	- H. S. Record	4	G	22
Continental Oil Company	- Meyer B-22	8	K	22
Continental Oil Company	- Meyer B-22	11	I	22

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Order No. R-4068

(1) - continued from Page 2 -

Company	Lease	Well No.	Unit	Section
Continental Oil Company	- Meyer B-22	5	M	22
Continental Oil Company	- Meyer B-22	6	O	22
Continental Oil Company	- Meyer A-29	6	A	29
Continental Oil Company	- Meyer A-29	8	I	29
Continental Oil Company	- Meyer B-28	7	C	28
Continental Oil Company	- Meyer B-28	3	A	28
Continental Oil Company	- Meyer B-28	10	E	28
Continental Oil Company	- Meyer B-28	6	G	28
Texas Pacific Oil Company	- B. A. Christmas	7	K	28
Texas Pacific Oil Company	- B. A. Christmas	3	I	28
Texas Pacific Oil Company	- B. A. Christmas	8	M	28
Atlantic Richfield	- J. L. Selby	4	D	33
Albert Gackle	- H. E. Esmond	4	G	33
Continental Oil Company	- Meyer B-33	9	L	33
Continental Oil Company	- Meyer B-33	3	I	33
Continental Oil Company	- Meyer B-33	8	N	33

(2) That the subject waterflood project is hereby designated the Continental South Eunice Unit Waterflood Project and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations;

PROVIDED HOWEVER, that the Secretary-Director of the Commission may approve expansion of the above-described waterflood project to include such additional injection wells in the area of said project as may be necessary to complete an efficient water injection pattern; that the showing of well response as required by Rule 701 E-5 shall not be necessary before obtaining administrative approval for the conversion of additional wells to water injection.

(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.

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CASE No. 4459

Order No. R-4068

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

STATE OF NEW MEXICO  
OIL CONSERVATION COMMISSION



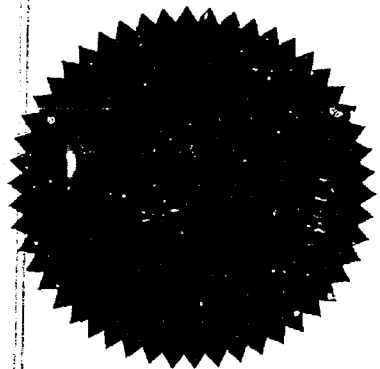
DAVID F. CARGO, Chairman



ALEX J. ARMILLO, Member



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



esr/

UNIT AGREEMENT  
SOUTH EUNICE UNIT  
LEA COUNTY, NEW MEXICO

5-18-70

UNIT AGREEMENT  
FOR THE DEVELOPMENT AND OPERATION  
OF THE SOUTH EUNICE UNIT  
LEA COUNTY, NEW MEXICO

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UNIT AGREEMENT  
FOR THE DEVELOPMENT AND OPERATION  
OF THE SOUTH EUNICE UNIT  
LEA COUNTY, NEW MEXICO

THIS AGREEMENT, entered into as of the 15th day of June, 1970, by and between the parties subscribing, ratifying or consenting hereto, and herein referred to as "parties hereto".

WITNESSETH: That,

WHEREAS, the parties hereto are the owners of working, royalty, or other oil or gas interests in the Unit Area subject to this Agreement; and

WHEREAS, the Oil Conservation Commission of the State of New Mexico is authorized by law (Chap. 72, Laws of 1935, as amended by Chap. 193, Laws of 1937, Chap. 166, Laws of 1941, and Chap. 168, Laws of 1949, Chap. 65, Art. 3, Sec. 14, N.M.S., 1953 anno) to approve this Agreement, and the conservation provisions hereof, and

WHEREAS, the Mineral Leasing Act of February 25, 1920, 41 Stat. 437, as amended, 30 U.S.C. Sections 181 et seq., authorizes Federal lessees and their representatives to unite with each other, or jointly or separately with others, in collectively adopting and operating a cooperative or unit plan of development or operation of any oil or gas pool, field or like area, or any part thereof for the purpose of more properly conserving the natural resources thereof whenever determined and certified by the Secretary of the Interior to be necessary or advisable in the public interest; and

WHEREAS, the parties hereto hold sufficient interests in the South Eunice Unit Area covering the land hereinafter described to give reasonably effective control of operations therein; and

WHEREAS, it is the purpose of the parties hereto to enable institution and consummation of secondary recovery operations, conserve natural resources, prevent waste and secure the other benefits obtainable through development and operation of the area subject to this Agreement under the terms, conditions, and limitations herein set forth;

NOW, THEREFORE, in consideration of the premises and the promises herein contained, the parties hereto commit to this Agreement their respective interests in the Unitized Formation of the below-defined Unit Area, and agree severally among themselves as follows:

SECTION 1. ENABLING ACT AND REGULATIONS. The Mineral Leasing Act of February 25, 1920, as amended, supra, and all valid pertinent regulations, including operating and unit plan regulations, heretofore issued thereunder and valid pertinent and reasonable regulations hereafter issued thereunder are accepted and made a part of this Agreement as to Federal lands, provided such regulations are not inconsistent with the terms of this Agreement; and, as to Non-Federal lands, the oil and gas operating regulations in effect as of the effective date hereof governing drilling and producing operations, not inconsistent with the terms hereof or the laws of the State in which the Non-Federal land is located, are hereby accepted and made a part of this Agreement.

SECTION 2. UNIT AREA AND DEFINITIONS. The area described in Exhibit B and depicted on Exhibit A attached hereto is hereby designated and recognized as constituting the Unit Area, containing 2720.00 acres, more or less, in Lea County, New Mexico. Said land is described as follows:

T-22S R-36E

Section 20: E/2 E/2	160.00 acres
Section 21: All	640.00
Section 22: S/2, S/2 N/2, NW/4 NW/4, NW/4 NE/4	560.00
Section 28: All	640.00
Section 29: E/2 NE/4, NE/4 SE/4	120.00
Section 33: N/2, SE/4, N/2 SW/4, SE/4 SW/4	600.00 <u>2720.00</u> acres

For the purpose of this agreement, the following terms and expressions as used herein shall mean:

(a) "Commission" is defined as the Oil Conservation Commission of the State of New Mexico.

(b) "Director" is defined as the Director of the United States Geological Survey.

(c) "Secretary" is defined as the Secretary of the Interior of the United States of America, or his duly authorized delegate.

(d) "Department" is defined as the Department of the Interior of the United States of America.

(e) "Supervisor" is defined as the Oil and Gas Supervisor of the United States Geological Survey.

(f) "Unitized Formation" is defined as the interval between the base of the Queen formation to a point 232 feet above the top of the Queen formation; provided, that in no event shall the Unitized formation extend below a depth of 4000 feet from the surface of the ground. The top and the base of the Queen formation are shown at the depths of 3821' and 4023' respectively, on the Gamma-Ray-Sonic log run in the Continental Oil Company West Arrowhead Deep Unit Well No. 1, located 1980 feet from the North line and 1980 feet from the West line of Section 17, Township 22 South, Range 36 East, N. M. P. M.

(g) "Unitized Substances" is defined as and shall mean all oil, gas, gaseous substances, sulphur contained in gas, condensate, and all associated and constituent liquid or liquefiable hydrocarbons produced from the Unitized Formation of the Unitized Land. However, it shall not include the dry gas and associated hydrocarbons produced from gas wells within the Unit Area which are completed in and produce from the vertical limits of the Jalmat gas pool, as defined by Commission Order No. R-1670.

(h) "Tract" is defined as each parcel of land described as such and given a Tract number in Exhibit B.

(i) "Tract Participation" is defined as that percentage of Unitized Substances produced from the Unitized Formation which is allocated to a Tract under this Agreement.

(j) "Unit Participation," of each Working Interest Owner, is defined as the sum of the percentages obtained by multiplying such Working Interest Owner's fractional Working Interest in each tract by the Tract Participation of such Tract.

(k) "Working Interest" is defined as the right to search for, produce and acquire Unitized Substances whether held as an incident of ownership of mineral fee simple title, under an oil and gas lease, or otherwise held.

(l) "Working Interest Owner" is defined as and shall mean any party hereto owning a Working Interest, including a carried working interest owner, whether by virtue of a lease, operating agreement, fee title or otherwise, whose interest is chargeable with and obligated to pay or bear, either in cash or out of production, or otherwise, all or a portion of the cost of drilling, developing and producing the Unitized Substances from the Unitized Formation and operating therefor hereunder. Any interest in Unitized Substances which is a Working Interest as of the date the owner thereof executes or ratifies this Agreement shall thereafter be treated as a Working Interest for all purposes of this Agreement. The owner of oil and gas rights that are free of lease or other instrument conveying the Working Interest to another shall be regarded as a Working Interest Owner to the extent of seven-eighths (7/8) of his interest in Unitized Substances, and as a Royalty Owner with respect to his remaining one-eighth (1/8) interest therein.

(m) "Royalty Interest" or "Royalty" is defined as any interest other than a Working Interest in or right to receive a portion of the Unitized Substances or the proceeds thereof and includes the royalty interest reserved by the lessor by an oil and gas lease and any overriding royalty interest, oil payment interest, or any other payment or burden which does not carry with it the right to search for and produce Unitized Substances. "Basic Royalty Interest" is defined as the royalty interest reserved by the lessor by an oil and gas lease.

(n) "Lessee of Record" is defined as the holder of record title under a U.S. Oil and Gas Lease.

(o) "Royalty Owner" is defined as and shall mean the owner of a Royalty Interest.

(p) "Unit Operating Agreement" is defined as and shall mean any agreement or agreements (whether one or more) entered into (separately or collectively) by and between the Unit Operator and the Working Interest Owners as provided in Section 9, infra, and shall be styled "Unit Operating Agreement, South Eunice Unit, Lea County, New Mexico."

(q) "Tract Current Revenue" is defined as the revenue, expressed in dollars, credited to each Tract during the period beginning April 1, 1968, and ending October 1, 1968, from the sale of oil and gas produced

from the Unitized Formation as compiled by the South Eunice Unit Engineering Committee and tabulated on the Schedule of Participation Parameters prepared by said committee.

(r) "Unit Current Revenue" is defined as the sum of "Tract Current Revenue" for all Tracts within the Unitized Area.

(s) "Useable Well" is defined as a cased wellbore which makes the unitized formation available from the surface without obstruction and in such condition that the well may be used either as a producing well or injection well without making repairs to the casing.

(t) "Tract Ultimate Primary Oil Production" is defined as the estimated ultimately recoverable oil, expressed in barrels of 42 U. S. gallons, from each Tract from inception of production to the economic limit of production under primary operations, as determined by the South Eunice Unit Engineering Committee and tabulated on the Schedule of Participation Parameters prepared by said committee.

(u) "Unit Ultimate Primary Oil Production" is defined as the sum of "Tract Ultimate Primary Oil Production" for all tracts within the Unitized Area.

(v) "Tract Remaining Gas Value" is defined as the value, expressed in dollars, of recoverable gas remaining to be produced from the unitized formation on each tract as of October 1, 1968, as determined by the South Eunice Unit Engineering Committee and tabulated on the Schedule of Participation Parameters prepared by said committee.

(w) "Unit Remaining Gas Value" is defined as the sum of "Tract Remaining Gas Value" for all Tracts within the Unitized Area.

(x) "Tract Acreage" is defined as the number of surface acres contained in each tract as determined and tabulated in the Schedule of Participation Parameters prepared by the South Eunice Unit Engineering Committee.

(y) "Unit acreage" is defined as the sum of "Tract Acreage" for all tracts within the Unitized Area.

SECTION 3. EXHIBITS. Exhibit A attached hereto is a map showing the Unit Area and, to the extent known to the Unit Operator, the boundaries and identity of Tracts and leases in said Unit Area. Exhibit B attached hereto is a schedule showing, to the extent known to the Unit

Operator, the acreage comprising each Tract, percentage ownership of each Working Interest Owner in each Tract, and the percentage and ownership of the Record Title in each Tract in the Unit Area, together with the Royalty Interests in each Tract and the ownership thereof, Exhibit C attached hereto is a schedule showing the tract number, description and the percentage of participation of each Tract in the Unit Area. Nothing herein or in said schedules or map shall be construed as a representation by any party hereto as to the ownership of any interest other than such interest or interests as are shown in said map or schedule as owned by such party.

Exhibits A, B, and C shall be revised by the Unit Operator whenever changes render such revisions necessary or when requested by the Supervisor, and not less than six copies thereof shall be filed with the Supervisor.

SECTION 4. EXPANSION. The above-described Unit Area may when practicable be expanded to include therein any additional Tract or Tracts regarded as reasonably necessary or advisable for the purposes of this Agreement. Such expansion shall be effected in the following manner:

(a) The Working Interest Owner or Owners of a Tract or Tracts desiring to commit such Tract or Tracts hereto shall file an application therefor with Unit Operator requesting such admission.

(b) Unit Operator shall circulate a notice to each Working Interest Owner of the proposed expansion, setting out the basis for admission, the proposed tract participation to be assigned to each such tract, and other pertinent data. After negotiation (at Working Interest Owners' meeting or otherwise), if 90 per cent of the Working Interest Owners (on the basis of unit participation) have agreed to such commitment of such Tract or Tracts, then Unit Operator shall, after preliminary concurrence by the Director

(1) Prepare a notice of proposed expansion describing the contemplated changes in the boundaries of the Unit Area, the reason therefor, the basis for admission of the additional Tract or Tracts, the Tract Participation to be assigned each such Tract and the effective date thereof, preferably 7:00 a.m. of the first day of the second month following final approval thereof as herein provided; and

(2) Furnish copies of said notice to the Supervisor, each Working Interest Owner, lessee, and lessor whose interests are affected (mailing copy of such notice to the last known address of each such Working Interest Owner), advising such parties that thirty (30) days will be allowed for submission to the Unit Operator of any objection to such proposed expansion, and

- (3) File, upon the expiration of said thirty (30) day period, as set out in (2) immediately above, the following: (i) Evidence as to mailing said notice of expansion; (ii) An application for such expansion in sufficient numbers for appropriate approval and distribution; and (iii) An instrument containing the appropriate joinders in compliance with the participation requirements of Section 14 (Tracts Qualified for Participation) and Section 33 (Non-Joinder and Subsequent Joinder), infra; and (iv) a copy of all objections received.

The expansion shall, after due consideration of all pertinent information and upon approval by the Supervisor and the Commission, become effective as of the date prescribed in the notice thereof. The revised Tract Participation of the respective Tracts included within the Unit Area prior to such enlargement shall remain the same ratio one to another.

SECTION 5. UNITIZED LAND AND UNITIZED SUBSTANCES. All land committed to this Agreement as to the Unitized Formation shall constitute land referred to herein as "Unitized Land" or "land subject to this Agreement." Unitized Substances are defined in Section 2(g) of this Agreement.

SECTION 6. UNIT OPERATOR. Continental Oil Company, a Delaware corporation, is hereby designated as Unit Operator. by signing this instrument as Unit Operator it agrees and consents to accept the duties and obligations of Unit Operator for the operation, development and production of Unitized Substances as herein provided. Whenever reference is made herein to Unit Operator, such reference means the Unit Operator acting in that capacity and not as an owner of interests in Unitized Substances; and the term "Working Interest Owner" when used herein shall include or refer to Unit Operator as the owner of a Working Interest when such an interest is owned by it.

SECTION 7. RESIGNATION OR REMOVAL OF UNIT OPERATOR. Unit Operator shall have the right to resign at any time, but such resignation shall not become effective so as to release Unit Operator from the duties and obligations of Unit Operator and terminate Unit Operator's rights as such for a period of six (6) months after written notice of intention to resign has been given by Unit Operator to all Working Interest Owners, and the Supervisor and until all unit wells are placed in a satisfactory condition for suspension, abandonment, or operations, whichever is required by the Supervisor and the Commission, unless a new Unit Operator shall have

taken over and assumed the duties and obligations of Unit Operator prior to the expiration of said period.

The Unit Operator may, upon default or failure in the performance of its duties or obligations hereunder, be subject to removal by 75 per cent of the committed Working Interest Owners (on the basis of then current Unit Participation) exclusive of the Working Interest Owner who is the Unit Operator. Such removal shall be effective upon notice thereof to the Supervisor.

In all such instances of effective resignation or removal, until a successor to Unit Operator is selected and approved as herein- after provided, the Working Interest Owners shall be jointly responsible for the performance of the duties of the Unit Operator and shall, not later than thirty (30) days before such resignation or removal becomes effective, appoint a Unit Manager to represent them in any action to be taken here- under.

The resignation or removal of Unit Operator under this Agreement shall not terminate its right, title or interest as the owner of a Working Interest or other interest in Unitized Substances, but, upon the resignation or removal of Unit Operator becoming effective, such Unit Operator shall deliver possession of all wells, equipment, books, and records, materials, appurtenances and any other assets, used in conducting the Unit operations and owned by the Working Interest Owners (including any and all data and information which it might have gained or assembled by reason of its operation of the Unitized Land) to the new duly qualified successor Unit Operator or to the Unit Manager if no such new Unit Operator has been elected, to be used for the purpose of conducting Unit Operations here- under. Nothing herein contained shall be construed to relieve or discharge any Unit Operator who resigns or is removed hereunder for any liability or duties accruing or performable by it prior to the effective date of such resignation or removal.

SECTION 8. SUCCESSOR UNIT OPERATOR. Whenever the Unit Operator shall tender its resignation as Unit Operator or shall be removed as here- inabove provided, the Working Interest Owners shall select a successor Unit Operator by a majority vote of the Working Interest Owners (on the basis of then current Unit Participation), provided no Working Interest

Owner who has been removed as Unit Operator may vote for self-succession. Such selection shall not become effective until (a) a Unit Operator so selected shall accept in writing the duties and responsibilities of Unit Operator; and (b) the selection shall have been approved by the Supervisor and the Commission. If no successor Unit Operator is selected and qualified as herein provided, the Supervisor at his election, may declare this Agreement terminated.

SECTION 9. ACCOUNTING PROVISIONS AND UNIT OPERATING AGREEMENT.

Costs and expenses incurred by Unit Operator in conducting Unit operations hereunder shall be paid, apportioned among, and borne by the Working Interest Owners in accordance with the Unit Operating Agreement; however, no such Unit Operating Agreement shall be deemed either to modify any of the terms and conditions of this Unit Agreement or to relieve the Unit Operator of any right or obligation established under this Agreement, and in case of any inconsistency or conflict between this Agreement and the Unit Operating Agreement, this Agreement shall prevail. Three true copies of any Unit Operating Agreement executed pursuant to this section shall be filed with the Supervisor prior to approval of this Agreement.

SECTION 10. RIGHTS AND OBLIGATIONS OF UNIT OPERATOR. Except as otherwise specifically provided herein, the exclusive right, privilege and duty of exercising any and all rights of the parties hereto which are necessary or convenient for prospecting for, producing, storing, allocating and distributing the Unitized Substances are hereby delegated to and shall be exercised by the Unit Operator as herein provided. Upon request, acceptable evidence of title to said rights shall be deposited with said Unit Operator and, together with this Agreement, shall constitute and define the rights, privileges, and obligations of Unit Operator. Nothing herein, however, shall be construed to transfer title to any land or to any lease or operating agreement, it being understood that under this Agreement the Unit Operator, in its capacity as Unit Operator, shall exercise the rights of possession and use vested in the parties hereto only for the purposes herein specified.

SECTION 11. EASEMENTS OR USE OF SURFACE.

(a) The parties hereto, to the extent of their rights and interests, hereby grant to Working Interest Owners the right to use as

much of the surface of the land within the Unit Area as may reasonably be necessary for Unit operations except a site for a gas injection, processing or other plant site.

(b) Working Interest Owners shall have free use of brine or water or both from the Unit Area for Unit operations, except water from any well, lake, pond, or irrigation ditch of a Surface Owner.

(c) Working Interest Owners shall pay the owner for damages to growing crops, timber, fences, improvements, and structures on the Unit Area that result from Unit operations.

SECTION 12. PLAN OF OPERATIONS. It is recognized and agreed by the parties hereto that all of the land subject to this Agreement is reasonably proved to be productive of Unitized Substances and that the object and purpose of this Agreement is to formulate and to put into effect a secondary recovery project in order to effect the greatest economic recovery of Unitized Substances, prevent waste and conserve natural resources, consistent with good engineering practices expected of a prudent operator. The parties hereto agree that the Unit Operator may, subject to the consent to a plan of operation by the Working Interest Owners and approval by the Supervisor, inject into the Unitized Formation, through any well or wells completed therein, brine, water, air, gas, oil and any one or more other substances whether produced from the Unitized Land or not, and that the location of input wells and the rates of injection therein shall be governed by standards of good engineering practices and conservation methods. After commencement of secondary operations, Unit Operator shall furnish the Supervisor monthly injection and production reports for each well in the Unit. The Working Interest Owners and the Supervisor shall be furnished periodic reports on the progress of the plan of operation and any revisions or changes thereto; provided, however, that any major revisions of the plan of operation involving a basic deviation from the initial plan of operation shall be subject to the approval of the Working Interest Owners and the Supervisor.

A plan of operation shall be filed with the Supervisor concurrently with the filing of this Unit Agreement for final approval. Said plan of operation and all revisions thereof shall be as complete and adequate as the Supervisor may determine to be necessary for timely

operation consistent herewith. Upon approval of this agreement and the aforementioned plan by the Supervisor, said plan, and all subsequently approved plans shall constitute the operating obligations of the Unit Operator under this agreement for the period specified therein. Thereafter, from time to time before the expiration of any existing plan, the unit operator shall submit for like approval a plan for an additional specified period of operation. Reasonable diligence shall be exercised in complying with the obligations of the approved plan of operation.

Notwithstanding anything to the contrary herein contained, should the Unit Operator fail to commence operations for the secondary recovery of Unitized Substances from the Unit Area within one (1) year after the effective date of this Agreement, or any extension thereof approved by the Supervisor this Agreement shall terminate automatically as of the date of default. After such operations are commenced, Unit Operator shall carry on such operations as would a reasonably prudent operator under the same or similar circumstances.

SECTION 13. TRACT PARTICIPATION. In Exhibit "C" attached hereto there are listed and numbered the various Tracts within the Unit Area, and set forth opposite each Tract is the Tract Participation of each Tract in the Unit Area during Phase I and Phase II, as hereinafter defined, calculated on the basis of 100 per cent commitment.

(a) Phase I Participation. Beginning at 7:00 a.m. on the effective date hereof and remaining in effect until 7:00 a.m. on the first day of the month following the date when the cumulative amount of oil produced from the Unitized Formation underlying all of the tracts described in Exhibit "B" from and after October 1, 1968, equals 116,910 barrels, the Tract Participation of each tract shall be as shown under Part I of Exhibit C and shall be determined by the following formula:

$$100 \times \frac{A}{B}$$

Where A = the Tract Current Revenue as defined in Section 2 hereinabove, and B = the Unit Current Revenue as defined in Section 2 hereinabove.

(b) Phase II Participation. Beginning at 7:00 a.m. on the first day of the month following the date the last of the 116,910 barrels referred to above shall have been produced, the Tract Participation of each Tract

shall be as shown under Part II of Exhibit "C" and shall be determined by the following formula:

Tract Participation Percentage equals

$$55 \times \frac{C}{D} \text{ plus } 35 \times \frac{E}{F} \text{ plus } 5 \times \frac{G}{H} \text{ plus } 5 \times \frac{I}{J}$$

WHERE: C equals the Tract Ultimate Primary Oil Production  
D equals the Unit Ultimate Primary Oil Production  
E equals the number of "Usable wells" on the tract  
F equals the number of "Usable wells" in the Unitized Area  
G equals the "Tract Remaining Gas Value" and  
H equals the "Unit Remaining Gas Value"  
I equals the "Tract Acreage" and  
J equals the "Unit Acreage"

as all terms are defined in Section 2 hereinabove.

In the event less than all of the Tracts within the Unit Area are qualified for unit participation as of the effective date hereof, Unit Operator shall, as soon as practicable after said effective date, prepare a revised Exhibit C setting forth the qualified Tracts and showing the revised Tract Participation of each qualified Tract, which Tract Participation shall be calculated and determined by using the factors and formulas set forth above, but applying the same only to the qualified Tracts. Unit Operator shall promptly file copies of such revised Exhibit C with the Supervisor and, unless such revised Exhibit C is disapproved by the Supervisor within thirty (30) days after such filing, the revised Exhibit C shall be effective as of the effective date of this Agreement, and shall thereafter govern the allocation of all Unitized Substances, subject, however, to any further revision or revisions of Exhibit C in accordance with the provisions hereof.

SECTION 14. TRACTS QUALIFIED FOR PARTICIPATION. As the objective of this Unit Agreement is to have the lands in the Unit Area operated and entitled to participation under the terms hereof, it is agreed that, notwithstanding anything herein to the contrary, no joinder shall be considered a commitment to this Unit agreement unless the Tract involved is qualified for participation under this Section 14.

(1) On and after the effective date hereof the Tracts qualified to participate hereunder shall be the Tracts that qualify as follows:

(a) Each tract as to which Working Interest Owners owning 100% of the Working Interest have become parties to this agreement and as to which (i) Royalty Owners under oil and gas leases on fee land owning seventy-five per cent (75%) or more of the Basic Royalty Interest; or (ii) Lessees of Record owning seventy-five per cent (75%) or more of the record title interest, whichever is applicable, have become parties to this Agreement.

(b) Each Tract as to which Working Interest Owners owning one hundred per cent (100%) of the Working Interest have become parties to this Agreement and as to which Royalty Owners under oil and gas leases on fee land owning less than seventy-five per cent (75%) of the Basic Royalty Interest or Lessees of Record owning less than seventy-five per cent (75%) of the record title interest have become parties to this Agreement and as to which (i) all Working Interest Owners in such Tract have joined in a request for the inclusion of such Tract in Unit participation on the basis of such commitment, and as to which (ii) seventy-five per cent (75%) of the combined voting interests of Working Interest Owners in all Tracts that meet the requirements of Section 14(1)(a) have voted in favor of the acceptance of such Tract as qualified for participation.

For the purpose of this Section 14(1)(b), the voting interest of a Working Interest Owner shall be equal to the ratio that its then current Unit Participation attributable to Tracts that qualify under Section 14(1)(a) bears to the total then current Unit Participation of all Working Interest Owners attributable to all Tracts that qualify under Section 14(1)(a).

(c) Each Tract as to which Working Interest Owners owning less than one hundred per cent (100%) of the Working Interest have become parties to this Agreement regardless of the percentage of Royalty or Record interests commitment hereto, and as to which (i) the Working Interest Owner who operates the Tract and all of the other Working Interest Owners in such Tract who have become parties to this Agreement have joined in a request for inclusion of such Tract in Unit Participation and have executed

and delivered an Indemnity agreement indemnifying and agreeing to hold harmless the other Working Interest Owners in the Unit Area, their successors and assigns, against all claims and demands that may be made by the owners of Working Interests in such Tract who are not parties to this Agreement, and which arise out of the acceptance of the Tract as qualified for Unit Participation; and as to which (ii) seventy-five per cent (75%) of the combined voting interest of Working Interest Owners in all Tracts that meet the requirements of Section 14(1)(a) and 14(1)(b) have voted in favor of the qualification of such Tract and acceptance of the indemnity agreement.

For the purpose of this Section 14(1)(c), the voting interest of each Working Interest Owner shall be equal to the ratio that its then current Unit Participation attributable to Tracts that qualify under Section 14(1)(a) and 14(1)(b) bears to the total then current Unit Participation of all Working Interest Owners attributable to all Tracts that qualify under Section 14(1)(a) and 14(1)(b). Upon the qualification of such a Tract under this Unit Agreement, the Unit Participation that would have been attributed to the non-subscribing owners of the Working Interest in such Tract, had they become parties to this Agreement and the Unit Operating Agreement, shall be attributed to the Working Interest Owners in such Tract who have become parties to such agreements, in proportion to their respective Working Interest in the Tract.

SECTION 15. ALLOCATION OF UNITIZED SUBSTANCES. All Unitized Substances produced and saved (less, any part of such Unitized Substances used in conformity with good operating practices on Unitized Land for drilling, operating, camp, and other production or development purposes and for pressure maintenance or which is unavoidably lost) shall be apportioned among and allocated to each of the qualified Tracts in accordance with the then effective Schedule of Participation in Exhibit "C". The amount of Unitized Substances allocated to each Tract (regardless of whether it be more or less than the amount of the actual production of Unitized Substances from the well or wells, if any, on such Tract) shall

be deemed for all intents, uses and purposes, to have been produced from such Tract.

The Unitized Substances allocated to each Tract shall be distributed among, or accounted for to, the parties executing, consenting to or ratifying this Agreement entitled to share in the production from such Tract in the same manner, in the same proportions, and upon the same conditions, as they would have participated and shared in the production from such Tracts, or in the proceeds thereof, had this Agreement not been entered into, and with the same legal force and effect.

No Tract committed to this Agreement and qualified for participation as above provided shall be subsequently excluded from participation hereunder on account of depletion of Unitized Substances; and nothing herein contained shall be construed as requiring any retroactive adjustment for production obtained prior to the effective date of the qualification of any Tract.

If the Working Interest or the Royalty Interest in any Tract are or become divided with respect to separate parcels or portions of such Tract and owned severally by different persons, the Unitized Substances allocated to such Tract shall, in the absence of a recordable instrument executed by all owners and furnished to Unit Operator fixing the divisions of ownership, be divided among the owners of interest in such parcels or portions in proportion to the number of surface acres in each.

The Unitized Substances allocated to each Tract shall be delivered in kind to the respective Working Interest Owners and parties entitled thereto by virtue of the ownership of oil and gas rights therein. Each Working Interest Owner and the parties entitled thereto shall have the continuing right to receive such production in kind at a common point within the Unit Area and to sell or dispose of the same as it sees fit. Each such party shall have the right to construct, maintain and operate all necessary facilities for that purpose on Unitized Land, provided the same are so constructed, maintained and operated as not to interfere with operations carried on pursuant hereto. Subject to Section 16 (Royalty Settlement) hereof, any extra expenditure incurred by the Unit Operator by reason of

the delivery in kind of any portion of the Unitized Substances shall be borne by the party receiving the same in kind.

In the event any party hereto shall fail to take or otherwise adequately dispose of its proportionate share of the Unitized Substances, Unit Operator, in order to avoid curtailing Unit operations, may sell or otherwise dispose of such production to itself or others on a day-to-day basis at not less than the prevailing market price in the area for like production; and the account of such party shall be charged therewith as having received such production. The net proceeds, if any, of the Unitized Substances so disposed of by Unit Operator shall be paid to the party entitled thereto; provided, however, Unit Operator shall not make a sale into interstate commerce of any Working Interest Owner's share of gas production without first giving such Working Interest Owner sixty (60) days' notice of such intended sale.

If, after the effective date of this Agreement, there is any Tract or Tracts that are subsequently committed hereto, as provided in Section 4 (Expansion), Section 14 (Tracts Qualified for Participation), and Section 33 (Non-Joinder and Subsequent Joinder) hereof, or if any Tract is excluded from the Unit Agreement as provided for in Section 32 (Loss of Title), the schedule of participation as shown in the current Exhibit C shall be revised by the Unit Operator and distributed to the Working Interest Owners and the Supervisor, together with revised exhibits A and B, if appropriate, to show the new percentage participation of all the qualified Tracts; and the revised schedule, upon approval by the Working Interest Owners and the Supervisor shall govern the allocation of Unitized Substances on and after the effective date thereof until the effective date of a new schedule so approved. The Tract Participations of all Tracts participating prior to any such revision shall remain in the same ratio one to the other.

SECTION 16. ROYALTY SETTLEMENT. The United States of America and all Royalty Owners who, under an existing contract, are entitled to take in kind a share of the Unitized Substances produced from any Tract unitized hereunder, shall continue to be entitled to such right to take in kind their share of the Unitized Substances allocated to such Tract, and Unit Operator shall make deliveries of such Royalty share taken in

conformity with the applicable contracts, laws and regulations. Settlement for Royalty Interest not taken in kind shall be made by Working Interest Owners responsible therefor under existing contracts, laws and regulations, on or before the last day of each month for Unitized Substances produced during the preceding calendar month; provided, however, that nothing herein contained shall operate to relieve the lessees of any land from their respective lease obligations for the payment of any Royalty due under their leases, except that such Royalty shall be computed in accordance with the terms of this Unit Agreement.

If gas obtained from lands not subject to this Agreement is introduced into the Unitized Formation for use in repressuring, stimulation or production or increasing ultimate recovery in conformity with a plan approved by the Supervisor, a like amount of gas, less appropriate deductions for loss from any cause, may be withdrawn from the Unitized Formation, royalty-free as to dry gas but not as to the products extracted therefrom; provided such withdrawal shall be pursuant to such conditions and formulas as may be prescribed or approved by the Supervisor, and provided further that such right of withdrawal shall terminate as of the effective date of termination of the Unit Agreement.

Royalty due the United States shall be computed as provided in the operating regulations and paid in value or delivered in kind as to all Unitized Substances on the basis of the amount thereof allocated to unitized Federal land as provided herein at the rates as may be authorized by law or regulation; provided that, for leases on which royalty rate depends on the daily average production per well, said average production shall be determined in accordance with the operating regulations as though the Unitized Land were a single consolidated lease.

Each Royalty Owner (other than the United States of America) that executes this Agreement represents that it is the owner of a Royalty Interest in Tract or Tracts within the Unit Area as its interest appears in Exhibit B attached hereto. Subject to Section 32 hereof, if any Royalty Interest in a Tract or Tracts should be lost by title failure or otherwise, in whole or in part, during the term of this Agreement, then the Royalty Interest of the party representing himself to be the owner

thereof shall be reduced proportionately and the interest of all parties in the affected Tract or Tracts shall be adjusted accordingly.

SECTION 17. RENTAL SETTLEMENT. Rentals or minimum royalties due on leases committed hereto shall be paid by Working Interest Owners responsible therefor under existing contracts, laws and regulations, provided that nothing herein contained shall operate to relieve the lessees of any land from their respective lease obligations for the payment of any rental or minimum royalty in lieu thereof due under their leases. Rental or minimum royalty for lands of the United States of America subject to this Agreement shall be paid at the rate specified in the respective leases from the United States of America, unless rental or minimum royalty is waived, suspended, or reduced by law or by approval of the Secretary or his duly authorized representative.

SECTION 18. CONSERVATION. Operations hereunder and production of Unitized Substances shall be conducted to provide for the most economical and efficient recovery of said substances without waste, as defined by or pursuant to Federal and State laws and regulations.

SECTION 19. DRAINAGE. The Unit Operator shall take appropriate and adequate measures to prevent drainage of Unitized Substances from Unitized Land by wells on land not subject to this Agreement.

SECTION 20. LEASES AND CONTRACTS CONFORMED AND EXTENDED. The terms, conditions and provisions of all leases, subleases and other contracts relating to exploration, drilling, development or operation for oil or gas on lands committed to this Agreement are hereby expressly modified and amended to the extent necessary to make the same conform to the provisions hereof, but otherwise to remain in full force and effect; and the parties hereto hereby consent that the Secretary shall, and by his approval hereof, or by the approval hereof by his duly authorized representatives, hereby establish, alter, change or revoke the drilling, producing, rental, minimum royalty and royalty requirements of Federal leases committed hereto and the regulations in respect thereto to conform said requirements to the provisions of this Agreement.

Without limiting the generality of the foregoing, all leases, subleases and contracts are particularly modified in accordance with the following:

(a) The development and operation of lands subject to this Agreement under the terms hereof shall be deemed full performance of all obligations for development and operation with respect to each and every part or separately owned tract subject to this Agreement, regardless of whether there is any development of any particular part or Tract of the Unit Area, notwithstanding anything to the contrary in any lease, operating agreement or other contract by and between the parties hereto, or their respective predecessors in interest, or any of them.

(b) Drilling, producing or secondary recovery operations performed hereunder upon any Tract of Unitized Land shall be accepted and deemed to be performed upon and for the benefit of each and every Tract of Unitized Land, and no lease shall be deemed to expire by reason of failure to drill or produce wells situated on land therein embraced.

(c) Suspension of drilling or producing operations on all Unitized Land pursuant to direction or consent of the Supervisor or his duly authorized representatives shall be deemed to constitute such suspension pursuant to such direction or consent as to each and every Tract of Unitized Land.

(d) Each lease, sublease, or contract relating to the exploration, drilling, development or operation for oil and gas which by its terms might expire prior to the termination of this Agreement is hereby extended beyond any such term so provided therein, so that it shall be continued in full force and effect for and during the term of this Agreement.

(e) Termination of this Agreement shall not affect any lease which, pursuant to the terms thereof or any applicable laws, shall continue in force and effect thereafter.

(f) The segregation of any Federal lease committed to this Agreement is governed by the following provision in the fourth paragraph of Section 17(j) of the Mineral Leasing Act, as amended by the Act of September 2, 1960 (74 Stat. 781-784);

"Any (federal) lease heretofore or hereafter committed to any such (unit) plan embracing lands that are in part within and in part outside of the area covered by any such plan shall be segregated into separate leases as to the lands committed and the lands not committed as of the effective date of unitization: Provided, however, that any such lease as to the non-unitized portion shall continue in force and effect for the term thereof but for not less than two years from the date of such segregation and so long thereafter as oil or gas is produced in paying quantities."

SECTION 21. CORRECTION OF ERRORS. It is hereby agreed by all parties to this Agreement that Unit Operator is empowered to correct any mathematical or clerical errors which may exist in the pertinent exhibits to this Agreement; provided, however, that correction of any error other than mathematical or clerical shall be made by Unit Operator only after first having obtained approval of Working Interest Owners and the Supervisor.

SECTION 22. COVENANTS RUN WITH LAND. The covenants herein shall be construed to be covenants running with the land with respect to the interest of the parties hereto and their successors in interest until this Agreement terminates; and any grant, transfer or conveyance of interest in land or leases subject hereto shall be, and hereby is, conditioned

upon the assumption of all privileges and obligations hereunder by the grantee, transferee or other successor in interest. No assignment or transfer of any Working Interest subject hereto shall be binding upon Unit Operator until the first day of the calendar month after Unit Operator is furnished with the original, or acceptable photostatic or certified copy, of the recorded instrument of transfer; and no assignment or transfer of any Royalty Interest subject hereto shall be binding upon the Working Interest Owner responsible therefor until the first day of the calendar month after said Working Interest Owner is furnished with the original, or acceptable photostatic or certified copy, of the recorded instrument of transfer.

SECTION 23. WAIVER OF RIGHT TO PARTITION. Each party hereto covenants that, during the existence of this Agreement, it will not resort to any action to partition the Unitized Land as to the Unitized Formation or the Unit Equipment, and to that extent waives the benefits of all laws authorizing such partition.

SECTION 24. EFFECTIVE DATE AND TERM. This Agreement shall become binding upon each party who executes or ratifies it as of the date of execution or ratification by such party and shall become effective as of 7 a.m. on the first day of the month next following:

(a) The execution or ratification of this Agreement and the Unit Operating Agreement by Working Interest Owners sufficiently to qualify under Section 14 (Tracts Qualified for Participation) hereof 85% (measured by surface area) of the lands comprising the Unit Area; and

(b) The approval of this Agreement by the Secretary and the Commission; and

(c) If (a) and (b) above are not accomplished on or before July 1, 1971, this Agreement shall ipso facto expire on said date (hereinafter called "expiration date") and thereafter be of no further force or effect, unless prior thereto Working Interest Owners owning a combined Phase I Unit Participation of at least 75% have become parties to this Agreement and the Working Interest Owners committed to the Agreement owning at least 65% Unit Participation have decided to extend the expiration date for a period not to exceed six (6) months. If the expiration date is so extended and requirements of Section 24(a) are not accomplished

on or before the extended expiration date, this Agreement shall ipso facto expire on the extended expiration date and thereafter be of no further effect. For the purpose of this section, Unit Participation shall be as shown on the original Exhibit C attached to the Unit Agreement.

(d) Unit Operator shall file at least one counterpart of this Agreement for record in the office of the County Clerk of Lea County, New Mexico. Within thirty (30) days after the effective date of this Agreement Unit Operator shall file for record in the county records where a counterpart of this Agreement is recorded a certificate to the effect that this Agreement has become effective according to its terms and stating further the effective date.

The term of this Agreement shall be for and during the time that Unitized Substances are or can be produced in quantities sufficient to repay the cost of producing same from the Unitized Land and as long thereafter as drilling, reworking or other operations (including secondary recovery operations) are prosecuted thereon without cessation of more than ninety (90) consecutive days, and so long thereafter as Unitized Substances can be produced as aforesaid.

This Agreement may be terminated by Working Interest Owners owning 90% Unit Participation then current at any time for any other reason, with the approval of the Supervisor. Notice of any such termination shall be given by Unit Operator to all parties hereto.

Upon termination of this Agreement, the parties hereto shall be governed by the terms and provisions of the leases and contracts affecting the separate tracts.

If not otherwise covered by the leases unitized under this Agreement, Royalty Owners hereby grant Working Interest Owners a period of six (6) months after termination of this Agreement in which to salvage, sell, distribute or otherwise dispose of the personal property and facilities used in connection with Unit operations.

SECTION 25. RATE OF PROSPECTING, DEVELOPMENT AND PRODUCTION.

All production and the disposal thereof shall be in conformity with allocations and quotas made or fixed by any duly authorized person or regulatory body under any Federal or State statute. The Director is hereby

vested with authority to alter or modify from time to time, in his discretion, the rate of prospecting and development and, within the limits made or fixed by the Commission, to alter or modify the quantity and rate of production under this Agreement, such authority being hereby limited to alteration or modification in the public interest, the purpose thereof and the public interest to be served thereby to be stated in the order of alteration or modification; provided further that no such alteration or modification shall be effective as to any privately owned lands subject to this Agreement as to the quantity and rate of production in the absence of specific written approval thereof by the Commission.

Powers in this Section vested in the Director shall only be exercised after notice to Unit Operator and opportunity for hearing to be held not less than fifteen (15) days from notice.

SECTION 26. NON-DISCRIMINATION. In connection with the performance of work under this Agreement, the Operator agrees to comply with all of the provisions of Section 202, (1) to (7) inclusive, of Executive Order 11246 (30 F.R. 12319), which are hereby incorporated by reference in this Agreement.

SECTION 27. APPEARANCES. Unit Operator shall, after notice to other parties affected, have the right to appear for or on behalf of any and all interests affected hereby before the Department, and the Commission, and to appeal from any order issued under the rules and regulations of the Department or the Commission, or to apply for relief from any of said rules and regulations or in any proceedings relative to operations before the Department or the Commission, or any other legally constituted authority; provided, however, that any other interested party shall also have the right at his or its own expense to be heard in any such proceeding.

SECTION 28. NOTICES. All demands, notices, objections or statements required hereunder to be given or rendered to the parties hereto shall be deemed fully given if made in writing and personally delivered to the party or parties or sent by post-paid registered or certified mail addressed to such party or parties at their respective addresses set forth in connection with the signatures hereto or to the ratification or consent hereof or to such other address as any such

party or parties may have furnished in writing to the party sending the notice, demand or statement.

SECTION 29. NO WAIVER OF CERTAIN RIGHTS. Nothing contained in this Agreement shall be construed as a waiver by any party hereto of the right to assert any legal or constitutional right or defense as to the validity or invalidity of any law of the State wherein said Unitized Land is located, or rules or regulations issued thereunder in any way affecting such party, or as a waiver by any such party of any right beyond his or its authority to waive.

SECTION 30. EQUIPMENT AND FACILITIES - FIXTURES ATTACHED TO REALTY. Each Working Interest Owner has heretofore placed and used on its Tract or Tracts committed to this Agreement various well and lease equipment and other property, equipment and facilities. It is also recognized that additional equipment and facilities may hereafter be placed and used upon the Unitized Land as now or hereafter constituted. Therefore, for all purposes of this Agreement, any and all such equipment shall be considered to be personal property and not fixtures attached to realty. Accordingly, said well and lease equipment and personal property is hereby severed from the mineral estates affected by this Agreement; and it is agreed that any and all such equipment and personal property shall be and remain personal property for all purposes.

SECTION 31. UNAVOIDABLE DELAY. All obligations under this Agreement requiring the Unit Operator to commence or continue secondary recovery operations or to operate on or produce Unitized Substances from any of the land covered by this Agreement shall be suspended while, but only so long as, the Unit Operator, despite the exercise of due care and diligence, is prevented from complying with such obligations, in whole or in part, by strikes, acts of God, Federal, State or municipal law or agency, unavoidable accident, uncontrollable delays in transportation, inability to obtain necessary materials in open market, or other matters beyond the reasonable control of the Unit Operator whether similar to matters herein enumerated or not.

SECTION 32. LOSS OF TITLE. In the event title to any Tract of Unitized Land shall fail so as to render the Tract inoperable under this Agreement and the true owner cannot be induced to join this Unit

Agreement, such Tract shall be automatically regarded as not committed hereto effective as of 7 a.m. on the first day of the calendar month in which such title failure is determined, and there shall be such re-adjustment of future costs and benefits as may be required on account of the loss of such title. In the event of a dispute as to title as to any Royalty, Working Interest or other interest subject thereto, payment or delivery on account thereof may be withheld without liability or interest until the dispute is finally settled; provided that, as to Federal land or leases, no payments of funds due the United States of America shall be withheld, but such funds shall be deposited as directed by the Supervisor, to be held as unearned money pending final settlement of the title dispute, and then applied as earned or returned in accordance with such final settlement.

Unit Operator as such is relieved from any responsibility for any defect or failure of any title hereunder.

SECTION 33. NON-JOINDER AND SUBSEQUENT JOINDER. Joinder by any Non-Working Interest Owner, at any time, must be accompanied by appropriate joinder of the corresponding Working Interest Owner in order for the interest of such Royalty Owner to be regarded as effectively committed. Joinder to the Unit Agreement by a Working Interest Owner, at any time, must be accompanied by appropriate joinder to the Unit Operating Agreement in order for such interest to be regarded as committed to this Unit Agreement.

Any oil or gas interest in the Unitized Formation underlying the Unit Area not committed hereto prior to submission of this Agreement for final approval may thereafter be committed hereto upon compliance with the applicable provisions of this Section and of Section 14. (Tracts Qualified for Participation) hereof, at any time up to the effective date hereof on the same basis of participation as provided in said Section 14, by the owner or owners thereof subscribing, ratifying, or consenting in writing to this Agreement and, if the interest is a Working Interest, by the owner of such interest subscribing also to the Unit Operating Agreement.

It is understood and agreed, however, that on and after the effective date hereof the commitment of a Working Interest in any Tract

within the Unit Area, shall be upon such equitable terms as may be negotiated by Working Interest Owners and the owners of such interests. Except as may be otherwise herein provided, subsequent Joinder as to Tracts within the Unit Area shall be effective as of 7 a.m. of the first day of the month following the filing with the Supervisor of duly executed counterparts of any and all documents necessary to establish effective commitment of his interest to this Agreement unless objection to such Joinder is made within sixty (60) days by the Supervisor.

SECTION 34. PRODUCTION AS OF THE EFFECTIVE DATE

(a) Oil in Lease Tankage of Effective Date. Unit Operator shall make a proper and timely gauge of all lease and other tanks on Unitized Land in order to ascertain the amount of merchantable oil above the pipe line connection in such tanks as of 7 a.m. on the effective date hereof. All such oil which has then been produced legally shall be and remain the property of the parties entitled thereto the same as if the Unit had not been formed; and such parties shall promptly remove said oil from the Unitized Land. Any such oil not so removed shall be sold by Unit Operator for the account of parties entitled thereto, subject to the payment of all royalty and other payment under the terms and provisions of the Unit Agreement and any applicable lease or leases and other contracts. Any oil that is in excess of the prior allowable of the wells from which it was produced shall be regarded as Unitized Substances produced after the effective date hereof.

(b) Overproduction. If, as of the effective date hereof, any Tract of Unitized Land is overproduced with respect to the allowable of the wells on such Tract and the amount of overproduction has been sold or otherwise disposed of, such overproduction shall be regarded as a part of the Unitized Substances produced after the effective date hereof and shall be charged to such Tract as having been delivered to the parties entitled to Unitized Substances allocated to such Tract.

SECTION 35. COUNTERPARTS. This Agreement may be executed in any number of counterparts, no one of which needs to be executed by all parties, and may be ratified or consented to by separate instrument in writing specifically referring hereto, and shall be binding upon all those parties who have executed such a counterpart, ratification or

consent hereto with the same force and effect as if all parties had signed the same document, and regardless of whether or not it is executed by all other parties owning or claiming an interest in the lands within the above-described Unit Area.

SECTION 36. TAXES. Each party hereto shall, for its own account, render and pay its share of any taxes levied against or measured by the amount or value of the Unitized Substances produced from the Unitized Land; provided, however, that, if it is required or if it be determined that the Unit Operator or the several Working Interest Owners must pay or advance said taxes for the account of the parties hereto, it is hereby expressly agreed that the parties so paying or advancing said taxes shall be reimbursed therefor by the parties hereto, including Royalty Owners, who may be responsible for the taxes on their respective allocated share of said Unitized Substances. No taxes shall be charged to the United States or to any lessor who has a contract with a lessee which requires his lessee to pay such taxes.

SECTION 37. CONFLICT OF SUPERVISION. Neither the Unit Operator nor the Working Interest Owners, nor any of them, shall be subject to any forfeiture, termination or expiration of any rights hereunder or under any leases or contracts subject hereto, or to any penalty or liability on account of delay or failure in whole or in part to comply with any applicable provisions thereof to the extent that the said Unit Operator or the Working Interest Owners, or any of them, are hindered, delayed or prevented from complying therewith by reason of failure of the Unit Operator to obtain, in the exercise of due diligence, the concurrence of proper representatives of the United States and proper representatives of the State of New Mexico in and about any matters or things concerning which it is required herein that such concurrence be obtained. The parties hereto, including the Commission, agree that all powers and authority vested in the Commission in and by any provisions of this Agreement are vested in the Commission and shall be exercised by it pursuant to the provisions of the laws of the State of New Mexico and subject in any case to appeal or judicial review as may now or hereafter be provided by the laws of the State of New Mexico.

SECTION 38. NO PARTNERSHIP. It is expressly agreed that the relation of the parties hereto is that of independent contractors, and nothing contained in this Agreement, express or implied, or any operations conducted hereunder, shall create or be deemed to have created a partnership or association between the parties hereto or any of them.

SECTION 39. BORDER AGREEMENTS. Subject to the approval of the Supervisor, the Unit Operator, with concurrence of Working Interest Owners having a combined Unit Participation of 75%, may enter into a border-protection agreement or agreements with the Working Interest Owners of adjacent lands with respect to operations designed to increase ultimate recovery, conserve natural resources and protect the parties and their interests.

SECTION 40. LIMITATION OF APPROVALS. Notwithstanding anything herein contained to the contrary, if no Federal lands are committed to this Agreement, then no consents or approvals provided herein shall be required of the Department, the Secretary, the Director, or the Supervisor, and it shall not be necessary to file any instrument hereunder with said officers or agencies unless and until Federal lands are so committed to this Agreement; likewise, if no State Lands are committed to this Agreement, then no consents or approvals provided herein shall be required of the Commissioner, and it shall not be necessary to file any instrument hereunder with said officer unless and until State lands are so committed to this Agreement; likewise, if no fee lands are committed to this Agreement, then no consents or approvals provided herein shall be required of the Commission; and it shall not be necessary to file any instrument hereunder with said office unless and until fee lands are so committed to this Agreement.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed and have set opposite their respective names the date of execution.

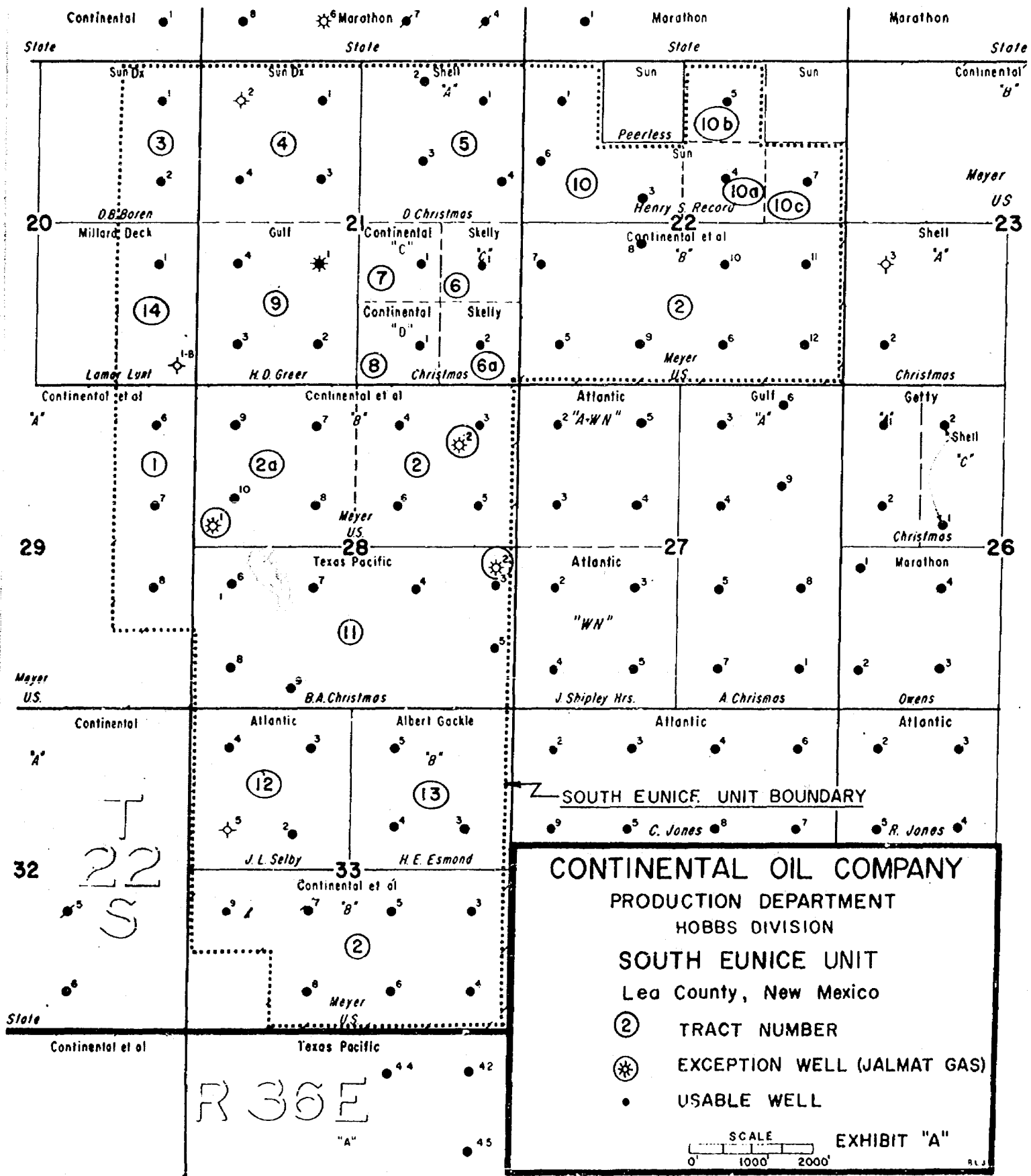
CONTINENTAL OIL COMPANY

ATTEST:

BY \_\_\_\_\_

ITS \_\_\_\_\_

DATE \_\_\_\_\_ UNIT OPERATOR AND WORKING INTEREST OWNER



SOUTH EUNICE UNIT  
EXHIBIT "B" TO UNIT AGREEMENT

Tract No.	Description of Land (All in T-22S, R-36E)	No. of Acres	Serial Number and Exp. Date	Basic Royalty Percentage	Record Lessee and Percentage	Overriding Royalty and Percentage	Working Interest Owner and Percentage	
1	Sec. 29: E/2 NE/4, NE/4 SE/4	120.00	LC 030133(a)	USA 100% Schedule C	Continental Oil Co. Atlantic Richfield Co. Chevron Oil Co. Pan American Pet. Corp.	25% 25% 25% 25% (See Appendix, Note No. 1)	Continental Oil Co. Atlantic Richfield Chevron Oil Co. Pan American Pet. Corp.	25% 25% 25% 25%
2	Sec. 22: S/2 Sec. 28: NE/4 Sec. 33: SE/4, E/2 SW/4, NW/4 SW/4	760.00	LC 030133(b)	USA 100%	Continental Oil Co. Atlantic Richfield Co. Chevron Oil Co. Pan American Pet. Corp.	25% 25% 25% 25% None	Continental Oil Co. Atlantic Richfield Chevron Oil Co. Pan American Pet. Corp.	25% 25% 25% 25%
2(a)	Sec. 28: NW/4	160.00	LC 030133(b)	USA 100% Schedule D	Continental Oil Co. Atlantic Richfield Co. Chevron Oil Co. Pan American Pet. Corp.	25% 25% 25% 25% None	Continental Oil Co. Atlantic Richfield Chevron Oil Co. Pan American Pet. Corp.	25% 25% 25% 25%
THREE FEDERAL TRACTS CONTAINING 1040.00 ACRES, OR 38.24% OF THE UNIT AREA								
3	Sec. 20: E/2 NE/4	80.00	HBP	(See Appendix, Note No. 2)	Sun Oil Co. - DX Div.	None	Sun Oil Co. - DX Div.	
4	Sec. 21: NW/4	160.00	HBP	(See Appendix, Note No. 3)	Sun Oil Co. - DX Div.	None	Sun Oil Co. - DX Div.	
5	Sec. 21: NE/4	160.00	HBP	(See Appendix, Note No. 4)	Wesley McCallister	None	Shell Oil Co. Gulf Oil Corp.	50% 50%
6	Sec. 21: NE/4 SE/4	40.00	HBP	(See Appendix, Note No. 5)	Skelly Oil Company	None	Skelly Oil Co.	
6(a)	Sec. 21: SE/4 SE/4	40.00	HBP	(See Appendix, Note No. 6)	Skelly Oil Company	None	Skelly Oil Co.	

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South Eunice Unit  
Exhibit "B" to Unit Agreement  
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Tract No.	Description of Land (All in T-22S, R-36E)	No. of Acres	Serial Number and Exp. Date	Basic Royalty & Percentage	Record Lessee	Overriding Royalty and Percentage	Working Interest Owner and Percentage
7	Sec. 21: NW/4 SE/4	40.00	HBP	See Appendix Note No. 7	J. H. Hendrix M. L. Klein	Shell Companies Foundation, Inc. 1.82292%#	Continental Oil Co.
8	Sec. 21: SW/4 SE/4	40.00	HBP	See Appendix Note No. 8	J. H. Hendrix M. L. Klein	Shell Companies Foundation, Inc. 6.25%#	Continental Oil Co.
9	Sec. 21: SW/4	160.00	HBP	See Appendix Note No. 9	Gulf Oil Corp.	None	Gulf Oil Corp.
10	Sec. 22: S/2 NW/4, NW/4 NW/4	120.00	HBP	See Appendix Note No. 10	Sun Oil Company	None	Sun Oil Company
10(a)	Sec. 22: SW/4 NE/4	40.00	HBP	See Appendix Note No. 11	Sun Oil Company	None	Sun Oil Company
10(b)	Sec. 22: NW/4 NE/4	40.00	HBP	See Appendix Note No. 12	Sun Oil Company	None	Sun Oil Company
10(c)	Sec. 22: SE/4 NE/4	40.00	HBP	See Appendix Note No. 13	Sun Oil Company	None	Sun Oil Company
11	Sec. 28: S/2	320.00	HBP	See Appendix Note No. 14	Texas Pacific Oil Company, Inc.	Emma L. Coleman & Levi Cole, Anc. Ex. Est. 0. L. Coleman, deceased 0.04883* Mary Vern Ransom 0.04883*	G. F. Bauerdorf Est. 24.316% Gordon M. Cone 2.734% E. A. Culbertson 6.079% W. W. Irwin 6.079% Reserve Oil & Gas 12.159% Texas Pacific Oil 48.633%

\* Until balance of Production Payment in the original sum of \$687.50 is paid, after which this interest reverts to Texas Pacific.

# This rate applies when daily average production per well is less than 35 barrels. When daily average production per well is over 35 barrels the royalty rate is double that shown.

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South Eunice Unit  
Exhibit "B" to Unit Agreement  
Page 3

Tract No.	Description of Land (All in T-22S, R-36E)	No. of Acres	Serial Number and Exp. Date	Basic Royalty & Percentage	Record Lessee	Overriding Royalty and Percentage	Working Interest Owner and Percentage
12	Sec. 33: NW/4	160.00	HBP	Atlantic Richfield Virginia P. Selby 9.375%	Unleased Texas Pacific Oil Company, Inc.	None Clear Fork Charity Foundation 4.0625% Howard Olson 1.2696% R. Olsen Est. 1.2695% The Prudential Insurance Co. 26.4062%#	Atlantic Richfield 50% Texas Pacific Oil Company, Inc. 50%
13	Sec. 33: NE/4	160.00	HBP	See Appendix Note No. 15	Atlantic Richfield	Atlantic Richfield 4.5573%*	Margaret B. Clay 20.6597% Clay Trusts 20.6597% Gackle Oil Co. 26.3889% Management Tr. 7.2917% Monsanto Co. 25.0000%
14	Sec. 20: E/2 SE/4	80.00	HBP	See Appendix Note No. 16	Millard Deck	Guy A. Swartz 2.400%	Millard Deck

16 FEE TRACTS CONTAINING 1680.00 ACRES OR 61.76% OF THE UNIT AREA

\*This represents interest in oil at producing rates below top allowable.  
At top allowable, interest increases to 9.1146%

#Production Payment

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SOUTH EUNICE UNIT  
APPENDIX TO EXHIBIT "B"

NOTE NO. 1 - Tract No. 1, Overriding Royalty and Percentage

	Col. A*	Col. B*
Albuquerque National Bank, Test. of Frank Andrews, deceased	0.15432	0.23148
Selma E. Andrews	0.17901	0.26851
Charles Francis Bedford	0.01333	0.02000
Helen L. Bedford, Ex/Est. of Edwin M. Bedford	0.01333	0.02000
Henry D. Bedford	0.01333	0.02000
Rachel Bedford Bowen	0.01333	0.02000
Boys Clubs of America	0.01666	0.02500
Lillian H. Coll, Executrix of the estate of Max W. Coll	0.16667	0.25000
Boyce Rush Davis	0.04167	0.06250
Elks National Foundation Trust Dept. Acct 5-5429135	0.01666	0.02500
Frank O. Elliott, Living Trust	0.08333	0.12500
A. H. Etz II	0.20833	0.31250
Robert William Etz	0.20834	0.31250
George Etz	0.41667	0.62500
Edna Ione Hall, Living Trust	0.08333	0.12500
Raymond Hubbard, Raymond E. Hubbard, Jr., Morgan R. Hubbard	0.16667	0.25000
U/W of G. E. Hubbard, deceased		
Ray E. Hubbard	0.16667	0.25000
W. W. Lechner	0.16667	0.25000
Patrick J. Leonard	0.02778	0.04167
Robert J. Leonard	0.02777	0.04167
Timothy T. Leonard	0.02778	0.04167
J. M. Richardson Lyeth, Jr. & Munro Longyear Lyeth, Joint Tenants	0.30000	0.45000
Marshall & Winston, Inc.	0.33333	0.50000
Mrs. May C. Meyer	0.62500	0.93750
William Joseph Meyer	0.37500	0.56250
Midwest Oil Corporation	0.66667	1.00000
New Mexico Boys Ranch, Inc.	0.01667	0.02500
Regents - University of New Mexico	0.01667	0.02500
Onez Norman Rooney	0.30000	0.45000
Lula S. Rush	0.08333	0.12500
Shattuck School	0.01667	0.02500
Ruth Rush Weaver	0.04167	0.06250
Ellen Anne W. Williams	0.01333	0.02000
*Column "A" is used when daily average production per well is less than 15 barrels; otherwise column "B" applies.	5.00000	7.500000

NOTE NO. 2 - Tract 3, Basic Royalty and Percentage

	Apparent Mineral Interest	Revenue Interest
Atlantic Richfield Company	27.8516	3.48145
Bradley Resources Corporation	0.7812	0.09765
The Chase Manhattan Bank	34.3880	4.29850
Lillian H. Coll ex/est. of M. W. Coll	2.3438	0.29297
First National Bank of Santa Fe	6.2500	0.78125
Florence E. Ernst and Manufacturers & Traders Trust Co., Trustee U/W W. J. Healey	5.3125	0.66406
Olivia W. Etz	1.1719	0.14648
A. H. Etz II	0.5859	0.07324
Robert William Etz	0.5860	0.07325

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Note No. 2 (Continued)

	<u>Apparent Mineral Interest</u>	<u>Revenue Interest</u>
Grace Healey Greenan	0.9375	0.11719
John H. Healey	6.2500	0.78125
Charles J. Hoffman	0.7812	0.09765
Nathan Kalvin	2.3438	0.29297
R. W. Kellough et al	1.0417	0.13021
Oil Finders, Inc.	1.5625	0.19531
Roger B. Owings	0.7812	0.09766
W. L. Pickens	3.1250	0.39063
Texaro Oil Company	0.7812	0.09766
Robert Allen Venable, executor, est. of R. H. Venable	1.5625	0.19531
John H. Wilson	1.5625	0.19531
	<u>100.0000</u>	<u>12.50000</u>

NOTE NO. 3 - Tract 4, Basic Royalty and Percentage

	<u>Apparent Min. Int.</u>	<u>Rev. Int.</u>
Lyman P. Anderson	6.2500	0.78125
C. F. Bedford	0.5000	0.06250
Helen L. Bedford Ex/est. of E. M. Bedford	0.5000	0.06250
Henry D. Bedford	0.5000	0.06250
Rachel B. Bowen	0.5000	0.06250
Hugh Corrigan III	1.5625	0.19531
J. Patrick Corrigan	1.5625	0.19531
Charles A. Dore	1.2500	0.15625
Felmont Oil Corporation	1.1231	0.14039
Fluor Corporation	6.2500	0.78125
Julian W. Glass, Jr., UWO J. Wood Glass, deceased	0.1465	0.01831
Mrs. Etta Greer	3.1250	0.39063
Clarence E. Hinkle	1.5625	0.19531
F. D. Jones estate (see Note #9)	0.5000	0.06250
J. M. Richardson Lyeth, Jr. and Munro L. Lyeth - J. T.	11.2500	1.40625
Petroleum Corporation of Texas	6.6666	0.83333
Phillips Investment Corporation	0.1465	0.01831
W. A. Pruett	0.6250	0.07813
Onez N. Rooney	11.2500	1.40625
Southern Minerals Corporation	13.3333	1.66667
Southern Petroleum Exploration, Inc.	15.6250	1.95312
Sparks-Healey Company	5.0000	0.62500
June D. Speight	6.2500	0.78125
The Superior Oil Company	3.8750	0.48437
Warren Bank and Trust Company, exe./est. of A. W. Goal, deceased	0.1465	0.01831
Ellen Anne W. Williams	0.5000	0.06250
	<u>100.0000</u>	<u>12.50000</u>

NOTE NO. 4 - Tract No. 5, Basic Royalty and Percentage

Atlantic Richfield Company	6.2500	0.78125
Joyce C. Brown	10.4166	1.30208
B. A. Christmas, Jr.	5.2083	0.65104
B. A. Christmas, Jr., Gdn/est. Bradford A. Christmas, a minor	1.3021	0.16276
B. A. Christmas, Jr., Gdn/est. Helen Jane Christmas, a minor	1.3021	0.16276
B. A. Christmas, Jr., Gdn/est. Candy Christmas, a minor	1.3021	0.16276
B. A. Christmas, Jr., Gdn/est. Mary Theresa Christmas, a minor	1.3021	0.16276

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<u>Note No. 4 (Continued)</u>	<u>Apparent Mineral Interest</u>	<u>Revenue Interest</u>
Gordon M. Cone	4.1667	0.52083
Continental Oil Company	3.1250	0.39063
Cities Service Oil Company	3.1250	0.39063
Fluor Corporation	16.6667	2.08333
Gavin R. Garrett	0.6944	0.08680
David E. Goodrich	0.6944	0.08681
Maurine V. Goodrich	4.1667	0.52083
The Fort Worth National Bank & Maurine V. Goodrich, exe. & trustees U/W of R. D. Goodrich, deceased	1.3889	0.17361
Robert R. Goodrich	0.6945	0.08681
Reginald Johnson, Charles G. Schrimmer & John D. Woodfin, Jointly	12.5000	1.56250
John F. Malloy	0.3473	0.04341
John F. Malloy, Tr. for John Goodrich Malloy	0.1157	0.01446
John F. Malloy, Tr. for Margaret Cecelia Malloy	0.1157	0.01447
John F. Malloy, Tr. for Paul Malloy	0.1157	0.01447
Southland Royalty Company	25.0000	3.12500
	<u>100.0000</u>	<u>12.50000</u>

NOTE NO. 5 - Tract 6, Basic Royalty and Percentage

Joyce Ann Brown	7.0833	0.88542
Joyce Christmas Brown	17.7083	2.21354
B. A. Christmas, Jr.	17.7083	2.21354
B. A. Christmas, Jr. U/W of B. A. Christmas, deceased	28.3333	3.54167
Gordon M. Cone	2.0833	0.26041
Fluor Corporation	16.6667	2.08333
The Fort Worth National Bank & Maurine V. Goodrich, Trustees U/W of Robert D. Goodrich	1.3889	0.17361
Gavin R. Garrett	0.6945	0.08681
David E. Goodrich	0.6944	0.08680
Maurine V. Goodrich	4.1667	0.52083
Robert R. Goodrich	0.6944	0.08681
Marjorie Cone Kastman, Katherine Cone Keck, S. E. Cone, Jr., Adm/est. of S. E. Cone, Deceased	2.0833	0.26042
John F. Malloy	0.3472	0.04340
John F. Malloy, Tr. for John Goodrich Malloy	0.1158	0.01447
John F. Malloy, Tr. for Margaret Cecelia Malloy	0.1158	0.01447
John F. Malloy, Tr. for Paul Malloy	0.1158	0.01447
	<u>100.0000</u>	<u>12.50000</u>

NOTE NO. 6 - Tract 6(a), Basic Royalty and Percentage

Ella Fulshear Allen	1.5625	0.19531
Lem B. Allen	1.5625	0.19532
William J. Collins, W. C. Stroube and R. L. Wheelock, Ind. exe/est. of J. L. Collins, deceased	5.0000	0.62500
The First National Bank, Corsicana, Texas, and Jane Case Wheelock, Ind. exe of the estate of R. L. Wheelock	2.5000	0.31250
The First National Bank in Dallas and Vera H. Long, Ind. exe. of the estate of Frank O. Long, deceased	0.0179	0.00224
Mrs. Martha W. Harris	1.0417	0.13021
Dena Ida Koenig, Ind. and as exe./est. of E. J. Koenig, deceased	0.2243	0.02804
La Gloria Oil and Gas Company	31.2500	3.90625
E. B. McKean	3.1250	0.39062

Note No. 6 (Continued)

	Apparent Mineral Interest	Revenue Interest
Mrs. Exor Megan, Gdn. of Maude Eagle Pfouts, a n/c/m	0.0090	0.00112
Mrs. Clyde W. Miller	1.0417	0.13021
W. D. Lamb, tr./est. of Gertrude S. Pearson	5.0000	0.62500
Elizabeth H. Penn, Tr/U/W of Robert Lee Penn, deceased	6.1112	0.76391
Nancy Elizabeth Penson	18.3379	2.29224
Royalty Roundup, Inc.	0.0304	0.00380
Georgia Ann Stieren, Ind Ex/U/W of Jack Stieren	0.2602	0.03253
H. R. Stroube	5.0000	0.62500
W. C. Stroube	5.0000	0.62500
Nora Walker	0.0090	0.00112
Myrtis Dean Watkins	1.0417	0.13021
Robert L. Wheelock, Jr., and Betty Wheelock Kennaugh, co- exe. of the estate of Maude C. Wheelock	2.5000	0.31250
Elizabeth Woolworth	4.1667	0.52083
May Woolworth	5.2083	0.65104
	<u>100.0000</u>	<u>12.50000</u>

NOTE NO. 7 - Tract No. 7, Basic Royalty and Percentage

Joyce C. Brown	37.2807	6.64063
B. A. Christmas, Jr.	18.6404	3.32031
B. A. Christmas, Jr., Gdn. for Bradford Christmas	4.6600	0.83008
B. A. Christmas, Jr., Gdn. for Candy Christmas	4.6600	0.83007
B. A. Christmas, Jr., Gdn. for Helen Jane Christmas	4.6600	0.83008
B. A. Christmas, Jr., Gdn. for Terri Christmas	4.6600	0.83008
Gordon M. Cone	1.4620	0.26041
Fluor Corporation	16.6667	2.08333
The Fort Worth National Bank & Maurine V. Goodrich, Tr. U/W of Robert D. Goodrich (Acct. 1759)	0.9747	0.17361
Gavin R. Garrett	3.4114	0.60764
David E. Goodrich	0.4874	0.08681
Robert R. Goodrich	0.4874	0.08681
Marjorie Cone Kastman, Katherine Cone Keck, S. E. Cone, Jr., Adm/Est. of S. E. Cone, Deceased	1.4620	0.26042
John F. Malloy	0.2437	0.04340
John F. Malloy, Tr. for John G. Malloy	0.0812	0.01446
John F. Malloy, Tr. for Margaret C. Malloy	0.0812	0.01447
John F. Malloy, Tr. for Paul Malloy	0.0812	0.01447
	<u>100.0000</u>	<u>16.92708</u>

NOTE NO. 8 - Tract 8, Basic Royalty and Percentage

Ella Fulshear Allen	1.5625	0.19532
Lemuel Byron Allen	1.5625	0.19531
S. M. Aronson	0.0045	0.00056
Vernon Carr	0.0003	0.00004
Carl Carr	0.0011	0.00014
W. J. Collins	0.0180	0.00225
W. J. Collins, W. C. Stroube and R. L. Wheelock, Jr., Ind. executors of the Estate of J. L. Collins	5.0000	0.62500
Helen Koenig Graves	0.0561	0.00701
Martha Watkins Harris	1.0417	0.13021
Dena Ida Koenig	0.1122	0.01402
Palmer Koenig	0.0561	0.00701
La Gloria Oil and Gas Company	31.2500	3.90625
W. D. Lamb, Tr. of the Gertrude S. Pearson Trust	5.0000	0.62500

Note No. 8 (Continued)

	Apparent Mineral Interest	Revenue Interest
E. B. McKean	3.1250	0.39062
Mrs. Clyde W. Miller	1.0417	0.13021
Elizabeth H. Penn, Tr U/W of Robert Lee Penn	6.1112	0.76391
Nancy E. Penson	18.3378	2.29222
Estate of George Pfouts	0.0090	0.00112
Royalty Roundup, Inc.	0.0180	0.00225
Harry Smith	0.0015	0.00018
Georgia Ann Stieren, ind. exe U/W of Jack Stieren	0.2603	0.03254
H. R. Stroube	5.0000	0.62500
W. C. Stroube	5.0000	0.62500
E. L. Vance	0.0050	0.00063
Mrs. Nora Walker	0.0090	0.00112
Myrtis Dean Watkins	1.0417	0.13021
R. L. Wheelock, Jr., & Betty W. Kennaugh, co-exe. of the estate of Maude C. Wheelock	5.0000	0.62500
Elizabeth Woolworth	4.1666	0.52084
May Woolworth	5.2082	0.65103
	<u>100.0000</u>	<u>12.50000</u>

NOTE NO. 9 - Tract No. 9, Basic Royalty and Percentage

Jacques Peter Adoue, Thomas J. Reilly, W. W. Bland, and the National Bank of Commerce of Houston, Tr. U/W of F. D. Jones	0.2500	0.0312
Charles F. Bedford	0.5000	0.0625
Edwin M. Bedford	0.5000	0.0625
Henry DeGraffenreid Bedford	0.5000	0.0625
Rachel Bedford Bowen	0.5000	0.0625
Hugh Corrigan III	1.5625	0.1953
J. Patrick Corrigan	1.5625	0.1953
Fannie B. Dore	1.2500	0.1563
Felmont Oil Corporation	1.1228	0.1404
First Wisconsin Trust Co., exe/est. Lillian Blanchard Jones	0.2500	0.0313
Fluor Corporation	6.2500	0.7812
Julian W. Glass, Jr., Tr. U/W J. Wood Glass	0.1466	0.0183
Etta Greer	3.1250	0.3906
Clarence E. Hinkle	1.5625	0.1953
J. M. Richardson Lyeth, Jr., and Munro Longyear Lyeth, First National Bank of Denver Trustees	11.2500	1.4062
The Pennsylvania Bank and Trust Co., Tr/Est. Albert Walter Goal, deceased	0.1466	0.0183
Petroleum Corporation of Texas	6.6666	0.8333
Phillips Investment Corporation	0.1466	0.0183
W. A. Pruett	0.6250	0.0781
Onez Norman Rooney	11.2500	1.4063
Agnes C. Smith	6.2500	0.7813
June D. Speight	6.2500	0.7813
Southern Minerals Corporation	13.3333	1.6667
Southern Petroleum Exploration, Inc.	15.6250	1.9531
Sparks Healy Company	5.0000	0.6250
The Superior Oil Company	3.8750	0.4844
Ellen Anne W. Williams	0.5000	0.0625
	<u>100.0000</u>	<u>12.5000</u>

	<u>Apparent Mineral Interest</u>	<u>Revenue Interest</u>
<u>NOTE NO. 10 - Basic Royalty under Tract No. 10</u>		
Atlantic Richfield Company	25.000	3.1250
J. L. Bennett, Estate	18.750	2.3437
The First National Bank in Dallas and Vena H. Long, Ind. exe/est. of F. O. Long, dec. (Acct. 222-05963)	0.014	0.0017
Fluor Corporation	37.500	4.6875
Elizabeth Heard Hudson	1.528	0.1910
Jack W. Hudson	1.528	0.1910
Jean Hudson	0.764	0.0955
Mary Helen Hudson	1.528	0.1911
Taylor Hudson	0.764	0.0955
William T. Hudson	1.528	0.1911
Dena Ida Koenig, Ind. Exe/est. of E. J. Koenig, dec.	0.168	0.0210
Mrs. Exor Megan, Gdn. of Est. of Mrs. Maude Eagle Pfouts, n/c/m	0.007	0.0008
Elizabeth H. Penn, Trustee U/W Robert Lee John Penn, deceased	4.584	0.5730
Nancy Elizabeth Penson	4.584	0.5729
Royalty Roundup, Inc.	0.023	0.0029
Georgia Ann Stieren, Ind. Ex U/W of Jack Stieren, Deceased	0.195	0.0244
Barbara Toltz	1.528	0.1911
Nora Walker	0.007	0.0008
	<u>100.000</u>	<u>12.5000</u>

NOTE NO. 11 - Basic Royalty under Tract 10(a)

Martha Watkins Harris	4.167	0.5209
Mary Horne Heath	37.500	4.6875
Mrs. Clyde W. Miller	4.166	0.5208
Lula Horn Rice	12.500	1.5625
Myrtis Watkins	4.167	0.5208
Elizabeth Woolworth	16.667	2.0834
May Woolworth	20.833	2.6041
	<u>100.000</u>	<u>12.5000</u>

NOTE NO. 12 - Basic Royalty Under Tract No. 10(b)

The First National Bank in Dallas and Vena H. Long, Ind. exe/est. of F. O. Long, dec. (Acct. 222-05963)	0.018	0.0022
Elizabeth Heard Hudson	2.038	0.2547
Jack W. Hudson	2.038	0.2547
Mary Helen Hudson	2.038	0.2547
Taylor Hudson	1.019	0.1274
William T. Hudson	2.037	0.2547
Jean Hudson Jensen	1.019	0.1274
Dena Ida Koenig, Ind. Exe/Est. of E. J. Koenig, dec.	0.224	0.0280
La Gloria Oil and Gas Company	25.000	3.1250
Mrs. Exor Megan, Gdn/Estate of Mrs. Maude Eagle Pfouts, n/c/m	0.009	0.0011
New Mexico Baptist Childrens' Home, Inc.	50.000	6.2500
Elizabeth H. Penn, Trustee U/W of Robert Lee John Penn, deceased	6.112	0.7640
Nancy Elizabeth Penson	6.112	0.7640
Royalty Roundup, Inc.	0.030	0.0038
Georgia Ann Stieren, Ind. Ex U/W of Jack Stieren, Deceased	0.260	0.0325
Barbara Toltz	2.037	0.2547
Nora Walker	0.009	0.0011
	<u>100.000</u>	<u>12.5000</u>

	Apparent Mineral Interest	Revenue Interest
<u>NOTE NO. 13 - Basic Royalty Under Tract No. 10(c)</u>		
Atlantic Richfield Company	25.000	3.1250
Rose M. Cottingham	12.500	1.5625
The First National Bank in Dallas and Vena H. Long, Ind. Exe/est. of F. O. Long, dec. (Acct. 222-05963)	0.018	0.0022
Fluor Corporation,	37.500	4.6875
Elizabeth Heard Hudson	2.038	0.2547
Jack W. Hudson	2.038	0.2547
Mary Helen Hudson	2.038	0.2547
Taylor Hudson	1.019	0.1274
William T. Hudson	2.037	0.2547
Jean Hudson Jensen	1.019	0.1274
Dena Ida Koenig, Ind. Exe/Est. of E. J. Koenig, deceased	0.224	0.0280
Mrs. Exor Megan, Gdn/Est. of Mrs. Maude Eagle Pfouts, n/c/m	0.009	0.0011
Elizabeth H. Penn Trustee U/W of Robert Lee John Penn, deceased	6.112	0.7640
Nancy Elizabeth Penson	6.112	0.7640
Royalty Roundup, Inc.	0.030	0.0038
Georgia Ann Stieren, Ind. Ex. U/W of Jack Stieren, Deceased	0.260	0.0325
Barbara Toltz	2.037	0.2547
Nora Walker	0.009	0.0011
	<u>100.000</u>	<u>12.5000</u>

NOTE NO. 14 - Tract 11, Basic Royalty & Percentage

Nathan Appleman and Janet Appleman, % The Bank of New York	12.5000	3.12500
Joyce Ann Brown	0.3125	0.03906
Joyce Christmas Brown	0.7813	0.09766
B. A. Christmas, Jr.	0.7813	0.09766
B. A. Christmas, Jr., Test/Tr. U/W B. A. Christmas, Sr., deceased	1.2500	0.15626
Emma Leora Coleman and William E. Adams, Anc. Co-exe/est. of O. L. Coleman	0.7813	0.09766
Estate of J. L. Collins, deceased	5.0000	1.25000
Fern Cone	4.4141	1.37940
Gordon M. Cone	2.7344	0.34170
S. E. Cone, Jr.,	3.0859	0.89203
Carrie Dean	9.3750	1.17188
H. V. Everett and Margaret Everett	3.1250	0.39063
Fluor Corporation	6.2500	1.56250
Nancy Griffin George	9.3750	1.17188
Elbert H. Griffin	1.5625	0.19532
Errol M. Griffin	1.5625	0.19532
Marjorie Cone Kastman	3.0468	0.88074
W. D. Lamb, Tr est. of -		
Gertrude S. Pearson	5.0000	1.25000
Mary Vern Ransom	0.7812	0.09766
Adam Rosson, Jr.	12.5000	1.56250
H. R. Stroube and Mary Stroube	5.0000	1.25000
W. C. Stroube and Bessie Watt Stroube	5.0000	1.25000
Estate of Maude C. Wheelock, deceased	2.5000	0.62500
Estate of R. L. Wheelock, deceased	2.5000	0.62500
J. H. Williams and Elizabeth Williams	0.7812	0.24414
	<u>100.0000</u>	<u>19.94900</u>

Apparent Mineral Interest	Revenue Interest
---------------------------------	---------------------

NOTE NO. 15 - Tract 13, Basic Royalty and Percentage

Atlantic Richfield Company	19.2708	2.40885
Bradley Resources Corporation	1.5625	0.19531
Lillie Stovall Esmond	12.5000	1.56250
First National Bank and Trust Co., Okla. City, Tr. No. 09630	2.0833	0.26042
Gackle Oil Co.	2.0833	0.26040
Helen K. Graves	0.0281	0.00351
Dena Ida Koenig	0.0561	0.00701
Palmer E. Koenig	0.0280	0.00351
La Gloria Oil and Gas Company	12.5000	1.56250
Monsanto Company	25.0000	3.12500
Elizabeth H. Penn, ind/exe. of estate of Robert Lee Penn	3.0557	0.38196
Nancy Elizabeth Penson	9.1690	1.14613
Mrs. Exor Megan, gdn. of est. of Maude E. Pfouts	0.0045	0.00056
Royalty Roundup, Inc.	0.0241	0.00301
Georgia Ann Stieren, Ind. Exe./Est. of Jack Stieren, deceased	0.1301	0.01627
Robert Allen Venable, ind. exe. & tr. U/W of R. H. Venable	12.5000	1.56250
Mrs. Nora Walker	0.0045	0.00056
	100.0000	12.50000

NOTE NO. 16 - Tract 14, Basic Royalty and Percentage

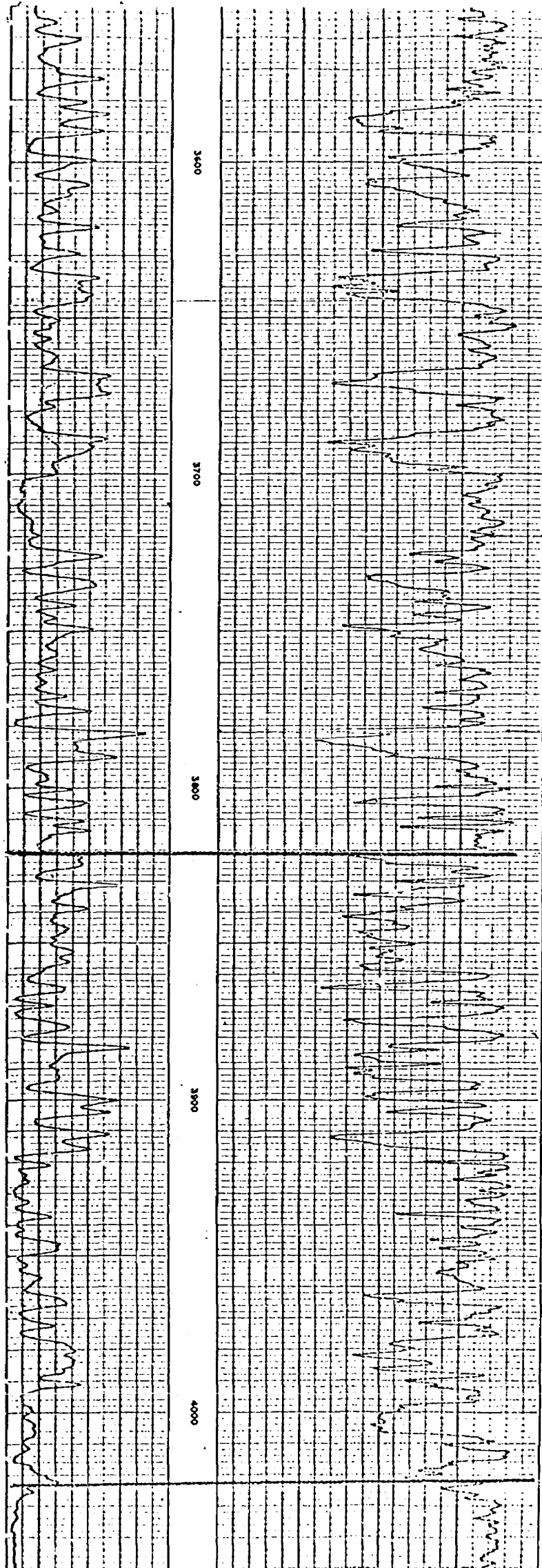
Atlantic Richfield Company	62.2396	11.66992
Bradley Resources Corp.	0.7813	0.14648
Coll Production, Inc.	1.7578	0.32958
Lillian H. Coll, Trustee	0.5859	0.10986
Florence E. Ernest and Manufacturers and Traders Tr. Co. of Buffalo, N. Y. Ex & Tr U/W William J. Healey, deceased	5.3125	1.32813
Dalport Oil Corp.	0.5208	0.13020
Alva N. Etz, II and wife, Jean W. Etz, JT W/ Ros	0.5859	0.10986
Olivia W. Etz	1.1719	0.21972
Robert W. Etz	0.5859	0.10986
First National Bank of Santa Fe, Trustee U/A dated 1-2-65	6.2500	1.56250
Gracy Healey Greenan	0.9375	0.23437
John H. Healey	6.2500	1.56250
Charles J. Hoffman	0.7813	0.19531
Nathan Kalvin	2.3438	0.58593
Oil Finders, Inc.	1.5625	0.29296
Roger B. Owings	0.7813	0.19531
W. L. Pickens	3.1250	0.78125
Jay Simmons	0.5208	0.13020
Texaro Oil Co.	0.7812	0.19531
Robert Allen Venable, Ind. Ex & Tr. U/W/ R. H. Venable, dec.	1.5625	0.39062
John H. Wilson	1.5625	0.29296
	100.0000	20.57283

10-15-70

EXHIBIT "C" TO UNIT AGREEMENT  
SOUTH EUNICE UNIT  
LEA COUNTY, NEW MEXICO

<u>Tract No.</u>	<u>Description</u>	<u>Phase I Participation</u>	<u>Phase II Participation</u>
1	Sec. 29: E/2 NE/4, NE/4 SE/4	6.24388	3.43588
2	Sec. 22: S/2 Sec. 28: NE/4 Sec. 33: SE/4, E/2 SW/4, NW/4 SW/4	21.89638	26.70781
2(a)	Sec. 28: NW/4	3.69285	4.72238
3	Sec. 20: E/2 NE/4	1.84119	3.67033
4	Sec. 21: NW/4	2.40259	12.63001
5	Sec. 21: NE/4	1.77839	6.48196
6	Sec. 21: NE/4 SE/4	1.00671	1.58512
6(a)	Sec. 21: SE/4 SE/4	0.62515	1.35154
7	Sec. 21: NW/4 SE/4	0.49384	1.10147
8	Sec. 21: SW/4 SE/4	4.53494	2.39248
9	Sec. 21: SW/4	7.25439	5.94656
10	Sec. 22: S/2 NW/4, NW/4 NW/4	7.23821	5.46449
10(a)	Sec. 22: SW/4 NE/4	2.10381	1.51564
10(b)	Sec. 22: NW/4 NE/4	1.83548	1.42864
10(c)	Sec. 22: SE/4 NE/4	7.51701	1.84416
11	Sec. 28: S/2	6.39231	7.85107
12	Sec. 33: NW/4	7.97659	4.95584
13	Sec. 33: NE/4	13.94358	6.03375
14	Sec. 20: E/2 SE/4	1.22270	0.88087

CONTINENTAL OIL COMPANY  
West Arrowhead Deep Unit No. 1  
Elev. DF: 3569'



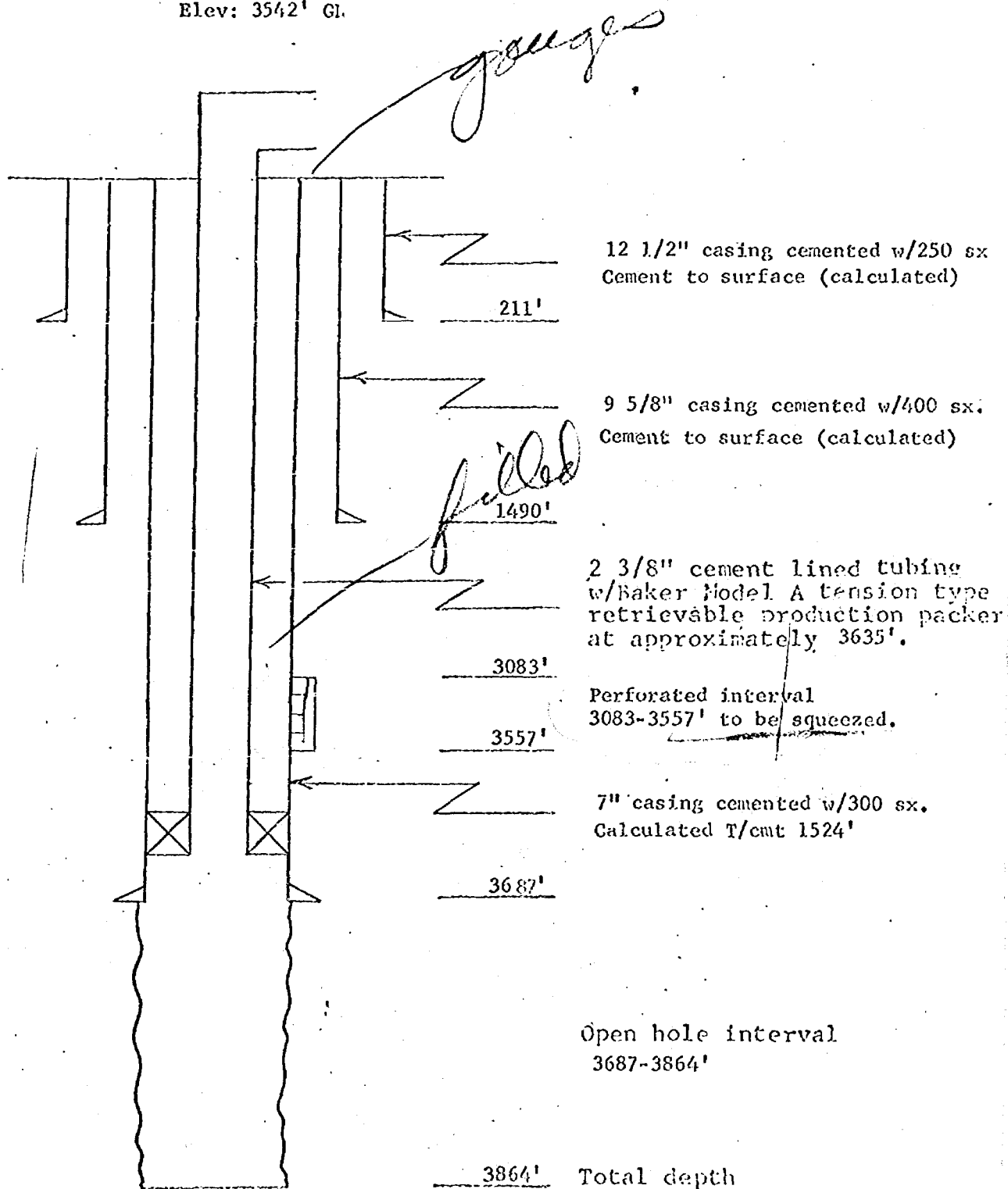
Top of Queen 3821'

Base of Queen and  
Top of Grayburg 4023'

Location: 1980 ENQWL  
Section 17, T22S  
R36E, Lea County  
New Mexico

## Water Well Injection Data

SUN DX  
D. B. Poren No. 1  
660' FNL & 660' FEL, Unit A  
Section 20-22-36  
Elev: 3542' GL



## Proposed Procedure

1. Rig up.
2. Squeeze 3083-3557'
3. Drill out bridge plug at 3600', and clean out to TD.
4. Run tubing and set at approximately 3635'.

## Water Injection Well Data

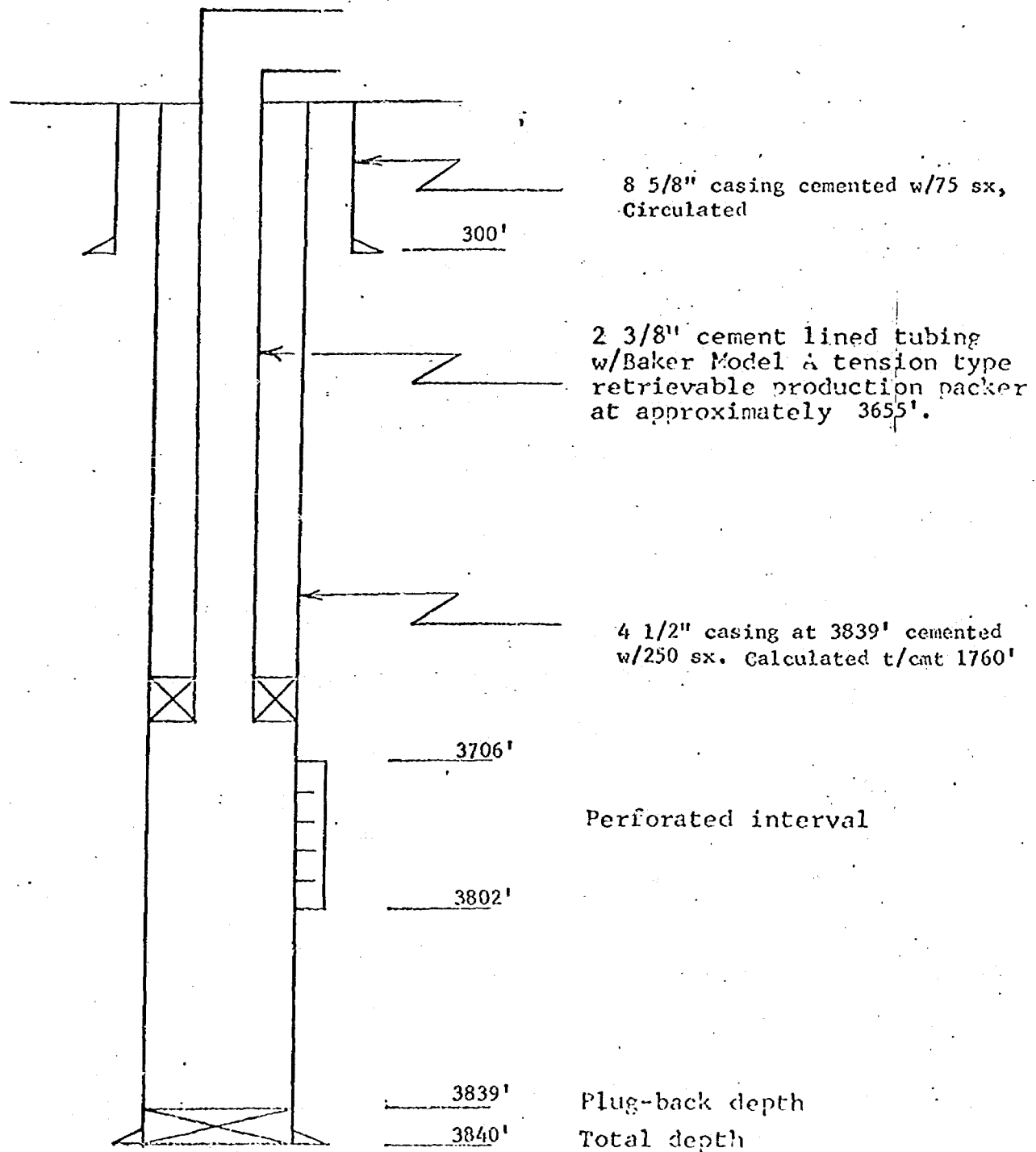
MILLARD DECK

Lamar Unit No. 1

1980' FSL & 660' FEL, Unit I

Section 20-22-36

Elev: 3542' G.L.

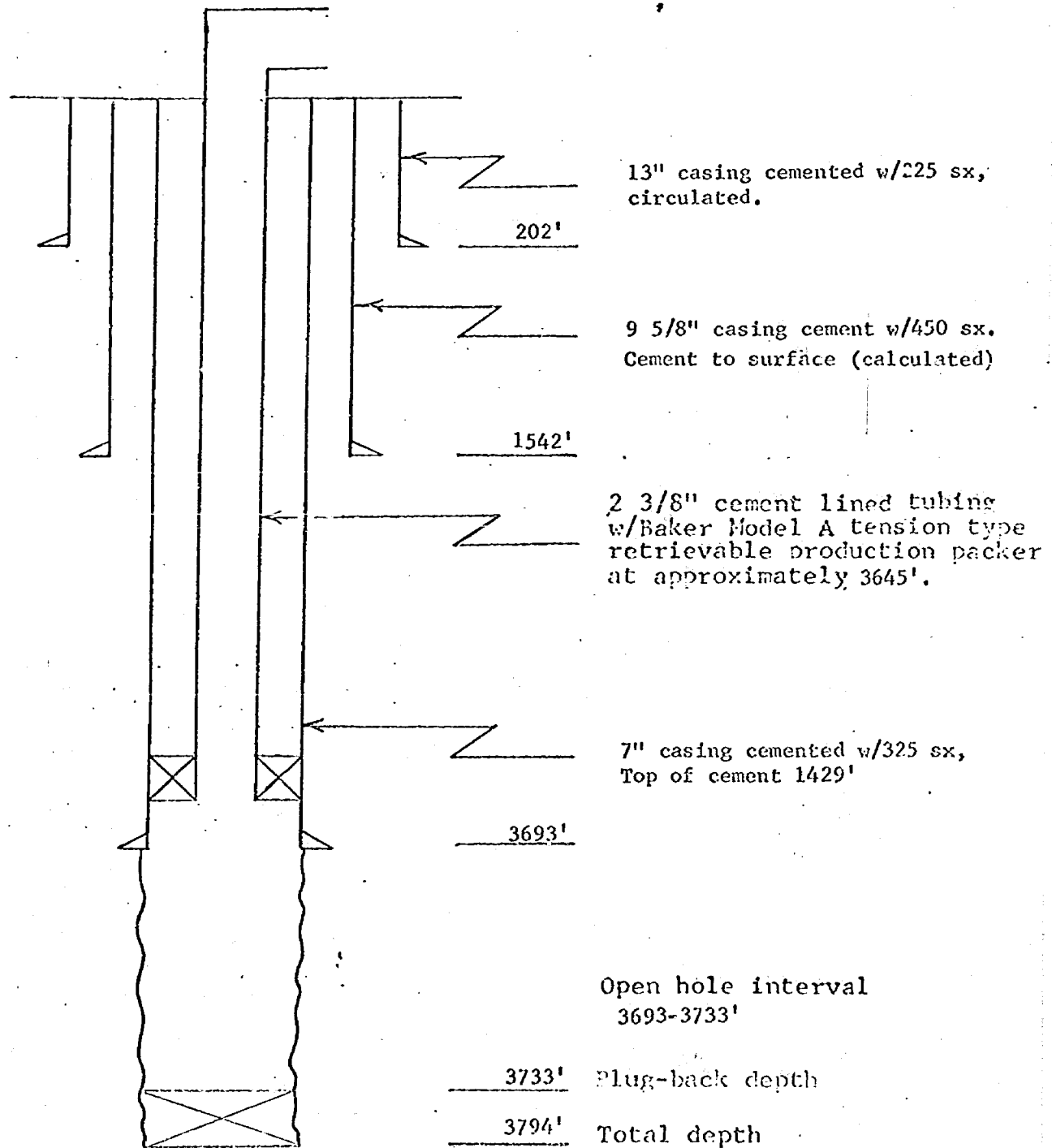


### Proposed Procedure

1. Rig up.
2. Tag bottom tally out.
3. If fill above 3802' clean to 3839' (PBD).
4. Run tubing and set at approximately 3655'.

## Water Well Injection Data

SUN DX  
H. D. Greer No. 1  
660' FNL & 1980' FWL, Unit C  
Section 21-22-36  
Elevation: 3526' GL

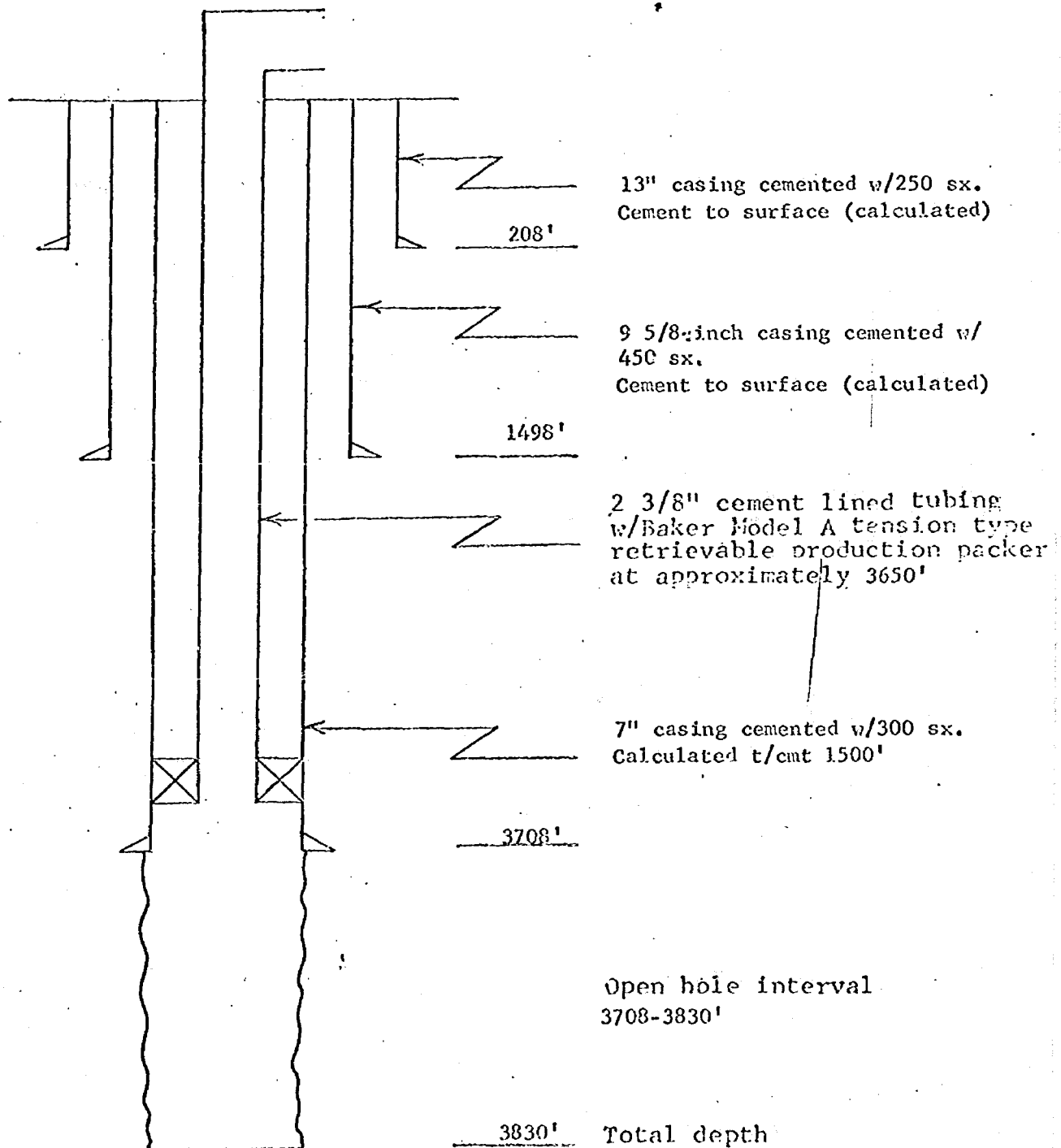


## Proposed Procedure

1. Rig up.
2. Pull tubing and Packer, tag fill.
3. Clean out fill if above 3730'.
4. Run tubing and set at approximately 3645'.

## Water Well Injection Data

SUN DX  
H. D. Greer No. 4  
1980' FNL & 660' FWL, Unit E  
Section 21-22-36  
Elev: 3545 GL

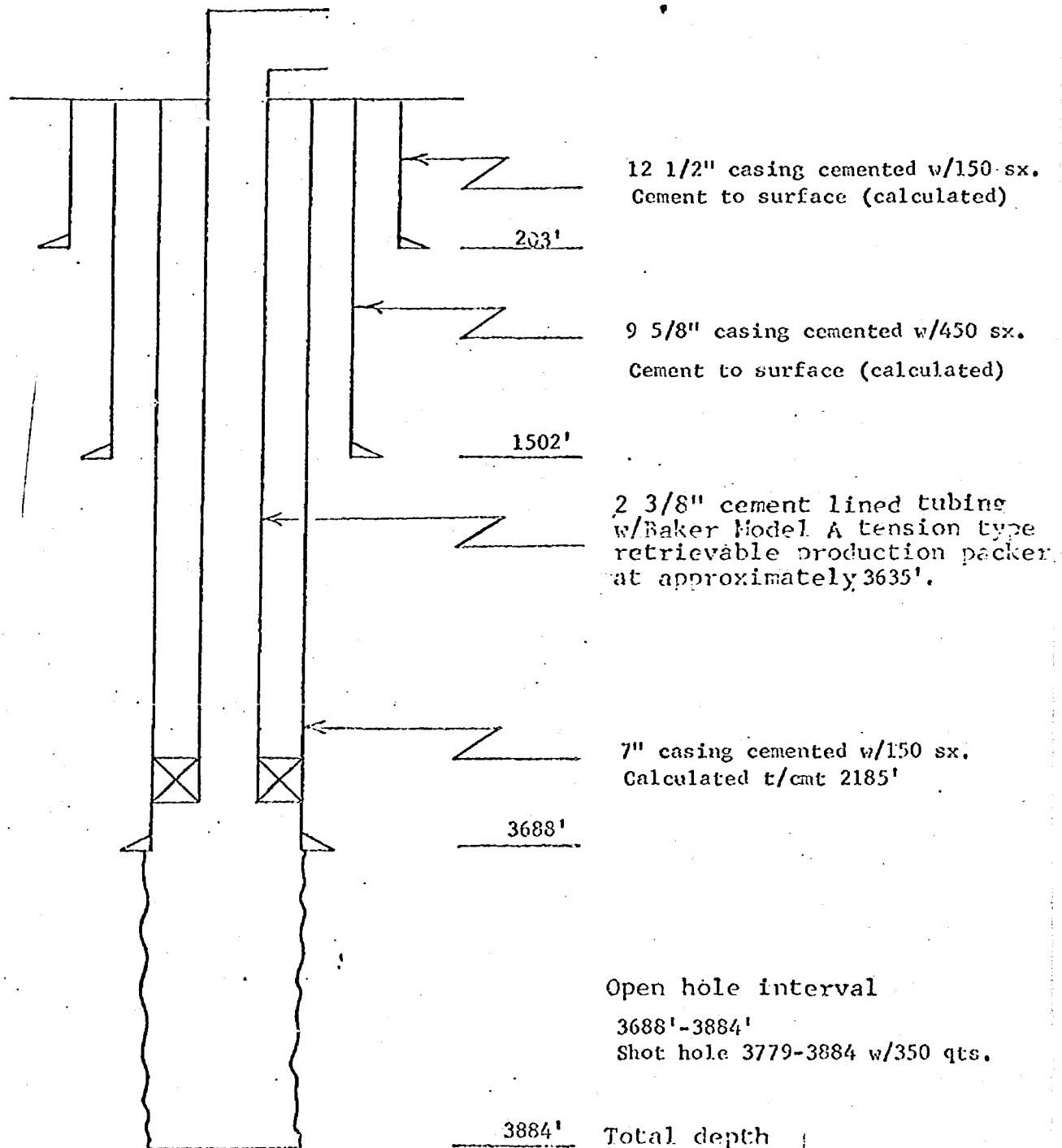


## Proposed Procedure

1. Rig up.
2. Pull tubing and packer, tag fill.
3. Clean out fill, if above 3755'.
4. Run tubing and set at approximately 3650'.

## Water Well Injection Data

SHELL OIL COMPANY  
D. Christmas No. 1  
660' FNL & 660' FEL, Unit A  
Section 21-22-36  
Elevation: 3539' DF

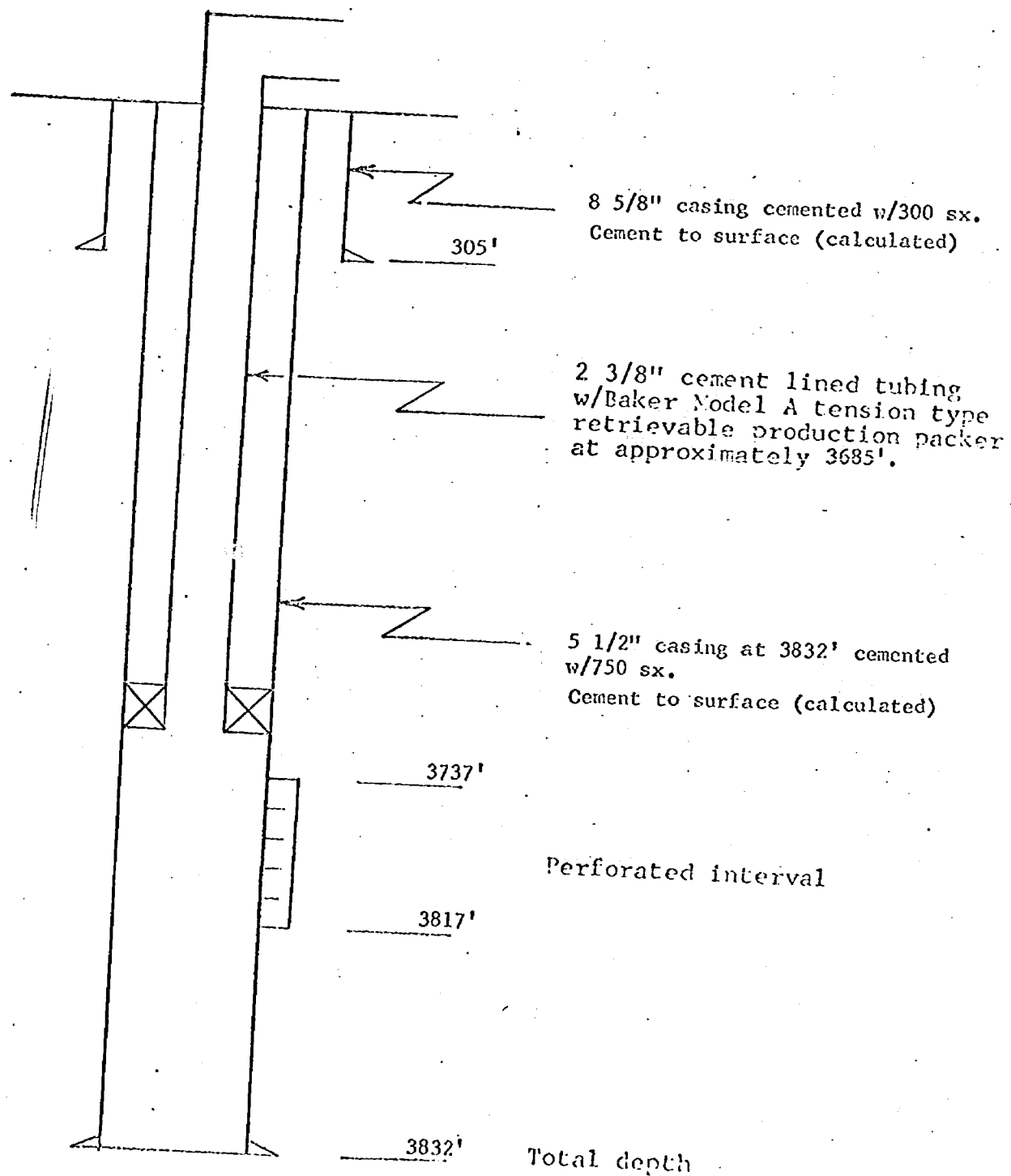


### Proposed Procedure

1. Pig up.
2. Pull tubing and packer, tag fill.
3. Clean out fill if above 3039'.
4. Run tubing and set at approximately 3635'.

# Water Injection Well Data

SHELL OIL COMPANY  
D. Christmas No. 3  
1650' FNL & 1650' FEL, Unit G  
Section 21-22-36  
Elev: 3535' DF



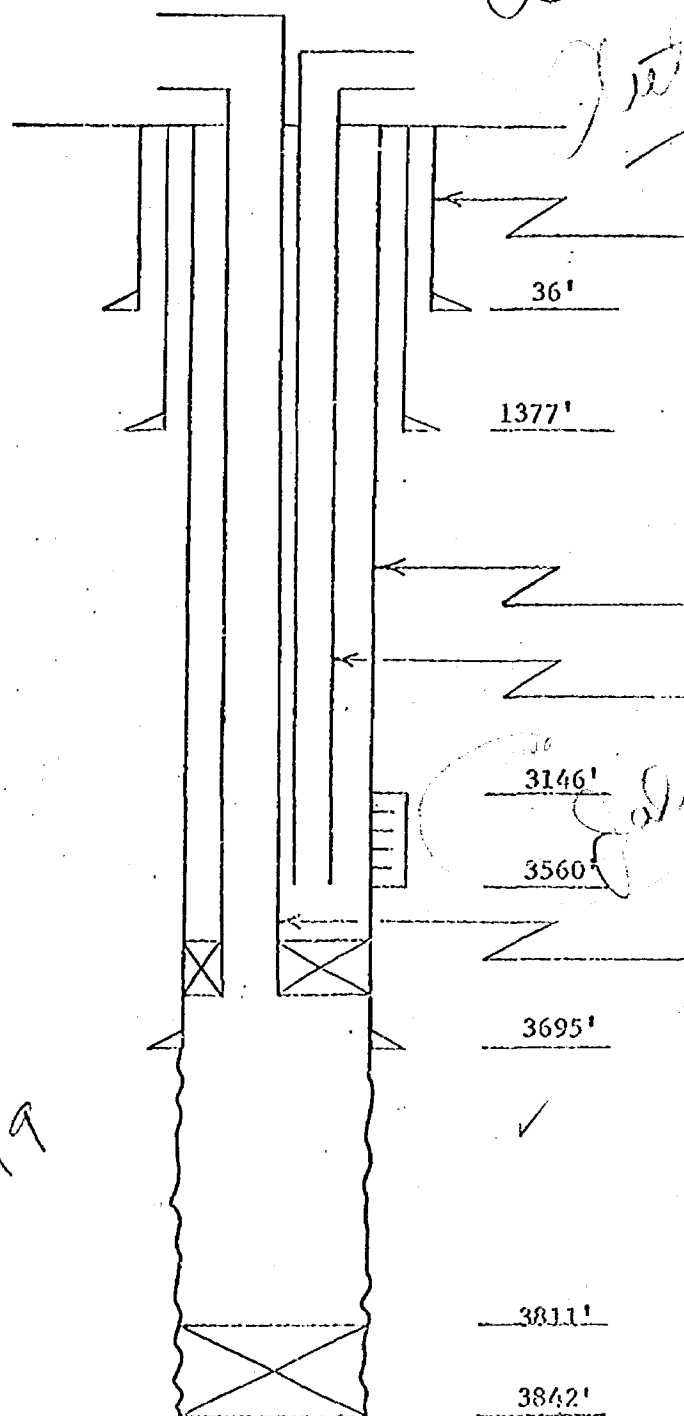
## Proposed Procedure

1. Rig up.
2. Tag bottom and rally out.
3. If fill above 3817' clean out to 3832' (TD).
4. Run tubing and set at approximately 3685'.

Exhibit 4-6

GULF OIL CORPORATION  
H. D. Greer No. 1  
1980' FSL & 1980' FWL, Unit K  
Section 21-22-36  
Elev: 3532' GL

*Dual*  
*Interference*



13" casing cemented w/60 sx.  
Cement to surface (calculated)

8 5/8" casing cemented w/600 sx.  
Cement to surface (calculated)

6" casing cemented w/150 sx.  
Calculated t/cmt 2600'

1 1/2" Special clearance  
tubing set at 3560'

Perforated interval 3146-3560'

2 3/8" Special clearance  
cement lined tubing w/existn.  
Baker Model D  
production packer  
set at approximately 3630'

Open Hole Interval  
3695-3811'

Plug Back Depth

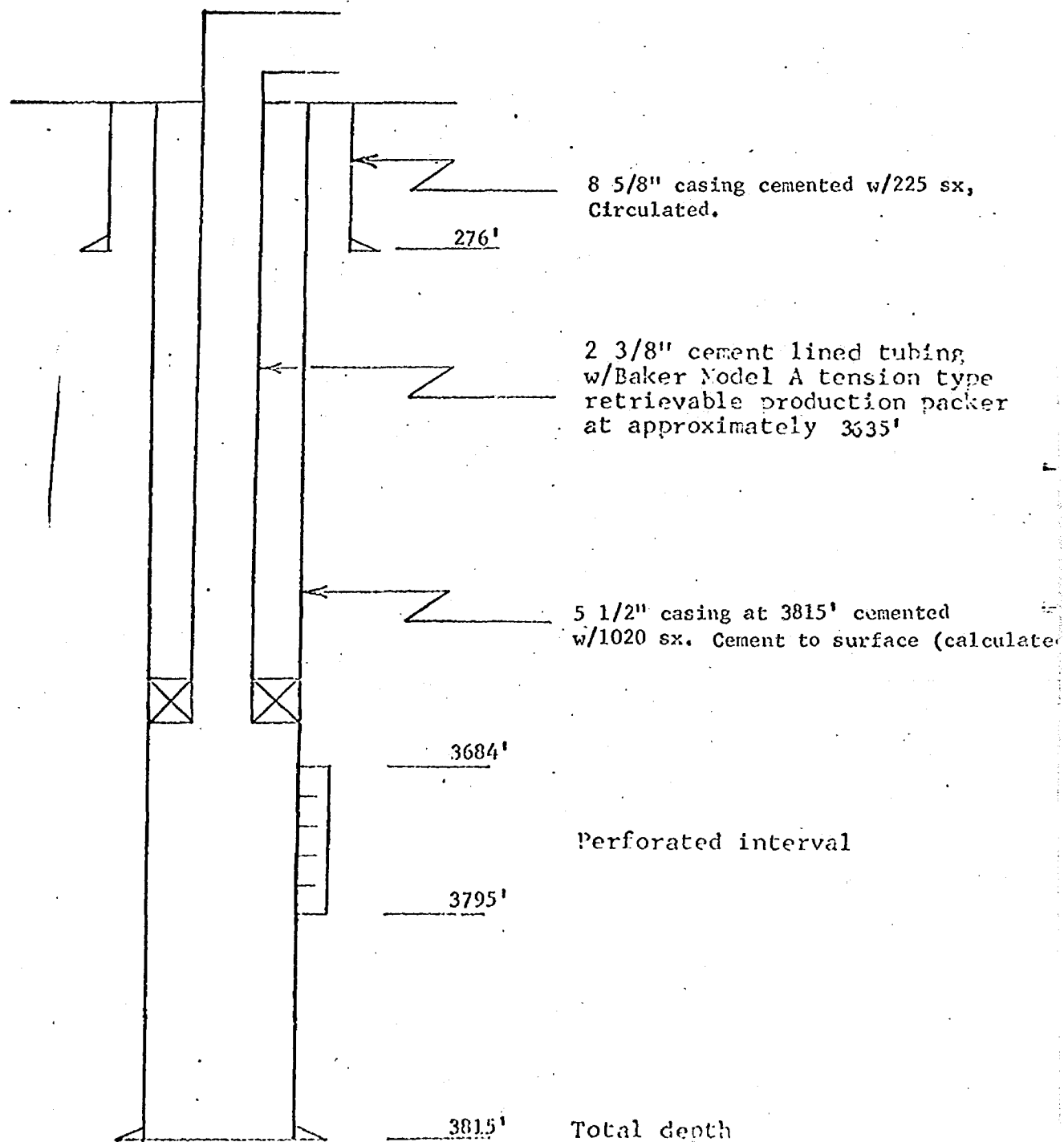
Total Depth.

DC 379

1. Rig up.
2. Pull tubing.
3. Run 2 3/8" tubing and set in packer at 3630'.
4. Run 1 1/2" special clearance tubing and set at approximately 3560'.

### Water Injection Well Data

GULF OIL CORPORATION  
H. D. Greer No. 3  
660' FSL & 660' FWL, Unit M  
Section 21-22-36  
Elevation: 3540' DF

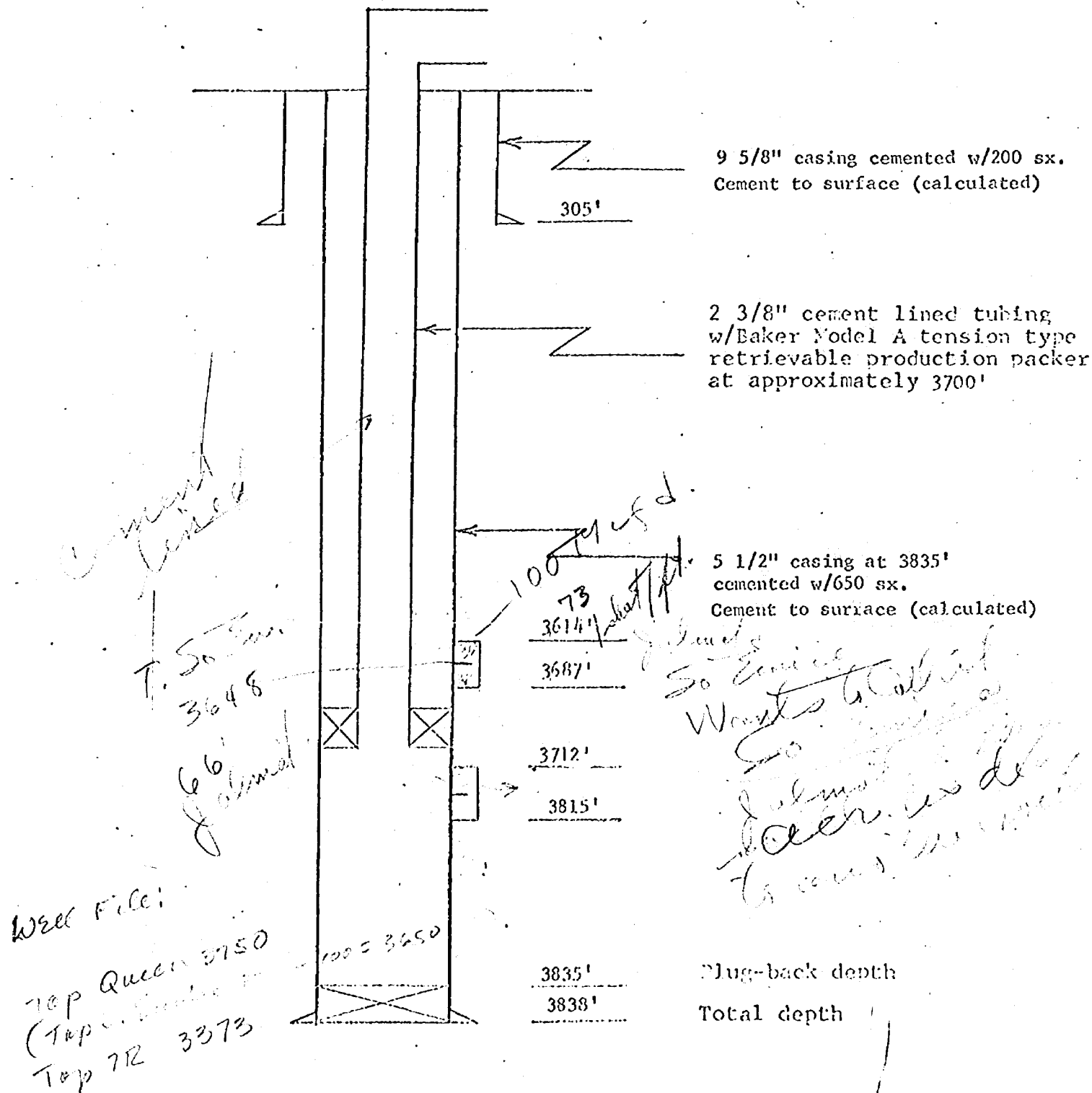


### Proposed Procedure

1. Rig up.
2. Tag bottom and tally out.
3. If fill above 3795' clean out to 3811'.
4. Run tubing and set at approximately 3635'.

# Water Injection Well Data

CONTINENTAL OIL COMPANY  
Christmas "D" No. 1-D  
660' FSL & 1650' FEL, Unit O  
Section 21-22-36  
Elev: 3535' DF

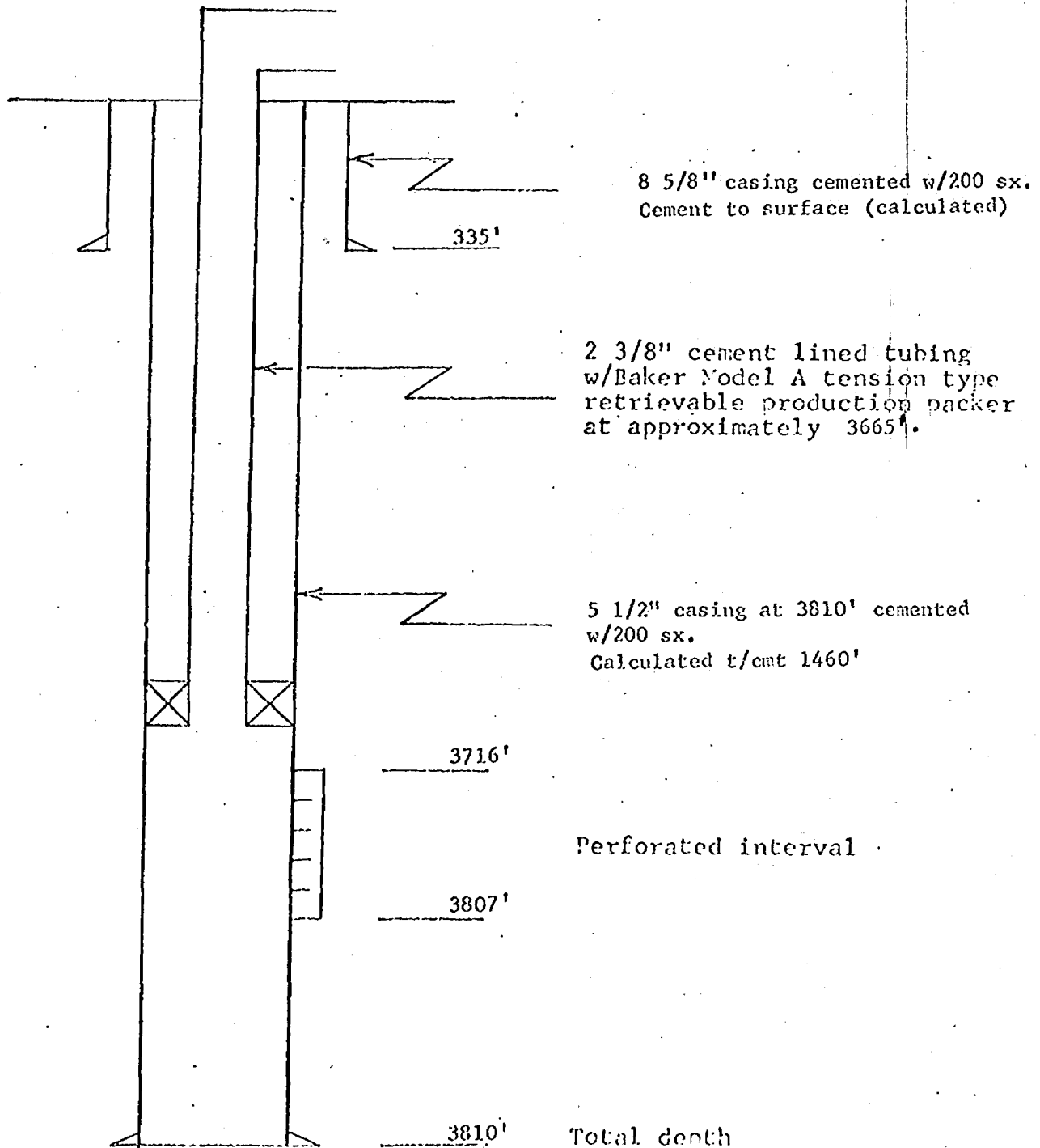


## Proposed Procedure

1. Rig up.
2. Tag bottom and tally out.
3. If fill above 3815' clean out to 3835' (PBD).
4. Run tubing and set at approximately 3700'.

# Water Injection Well Data

SKELLY OIL COMPANY  
Christmas "C" No. 1  
1980' FSL & 660' FEL, Unit I  
Section 21-22-36  
Elevation: 3515' GL



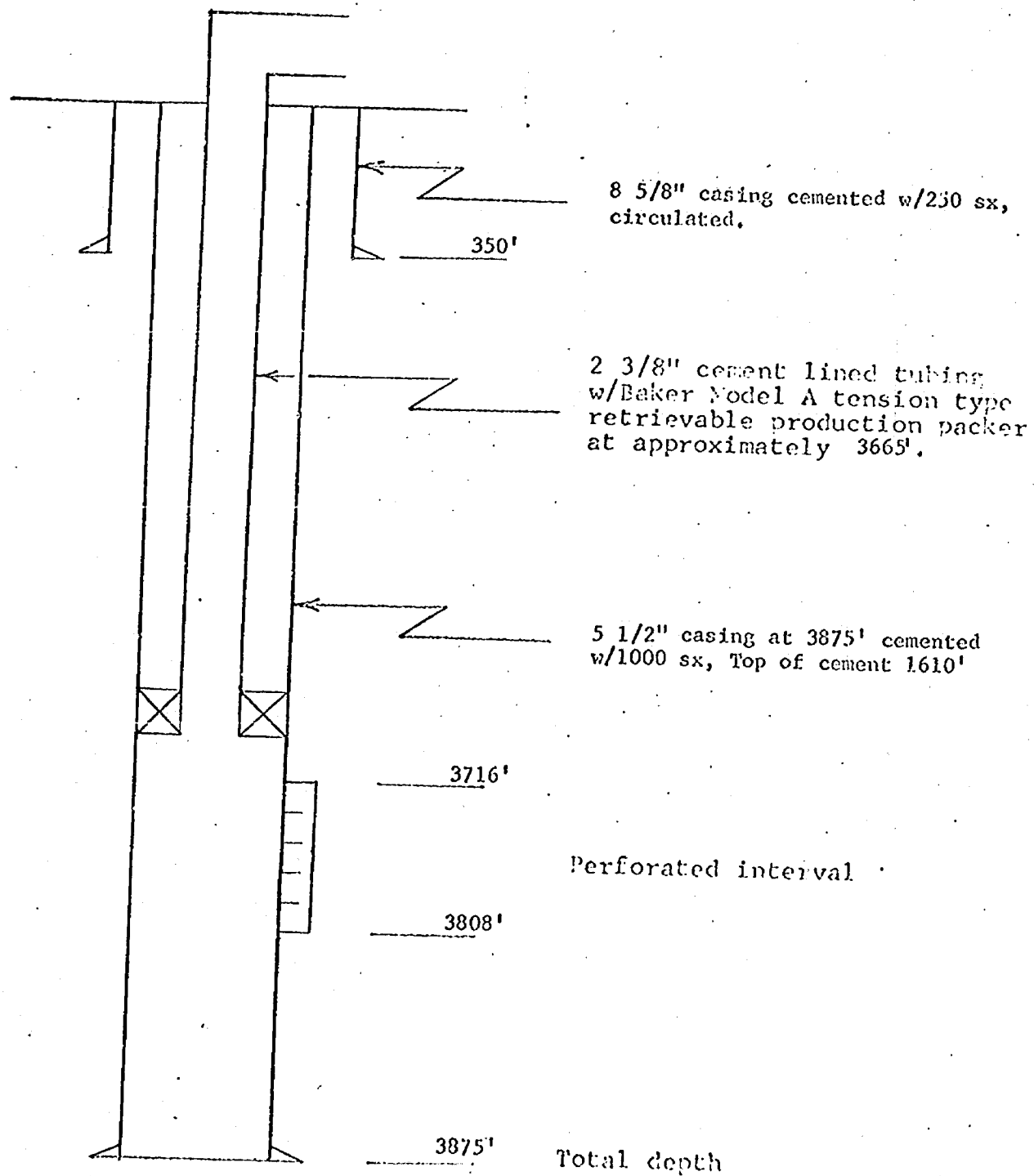
## Proposed Procedure

1. Rig up.
2. Tag bottom and tally out.
3. If fill above 3807' clean out to 3810' (TB).
4. Run tubing and set at approximately 3665'.

Exhibit 4-10

# Water Injection Well Data

SUN OIL COMPANY  
H. S. Record No. 6  
1650' FNL & 380' FWL, Unit E  
Section 22-22-36  
Elev: 3520' GL

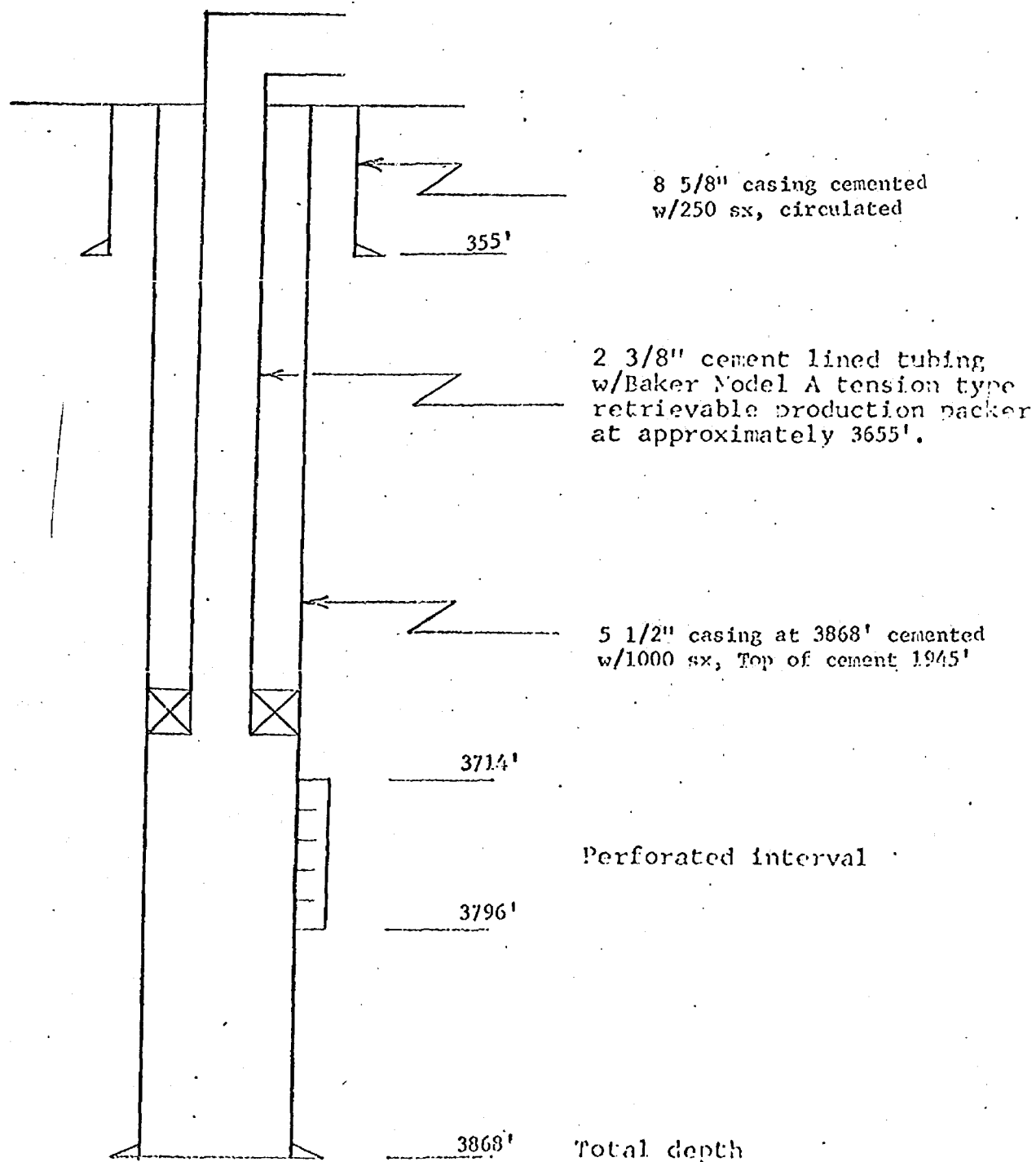


## Proposed Procedure

1. Rig up.
2. Tag bottom and tally out.
3. If fill above 3808' clean out to 3825'.
4. Run tbg. and set at approximately

# Water Injection Well Data

SUN OIL COMPANY  
H. S. Record No. 4  
1980' FNL & 1980' FEL, Unit G  
Section 22-22-36  
Elev: 3527' GL

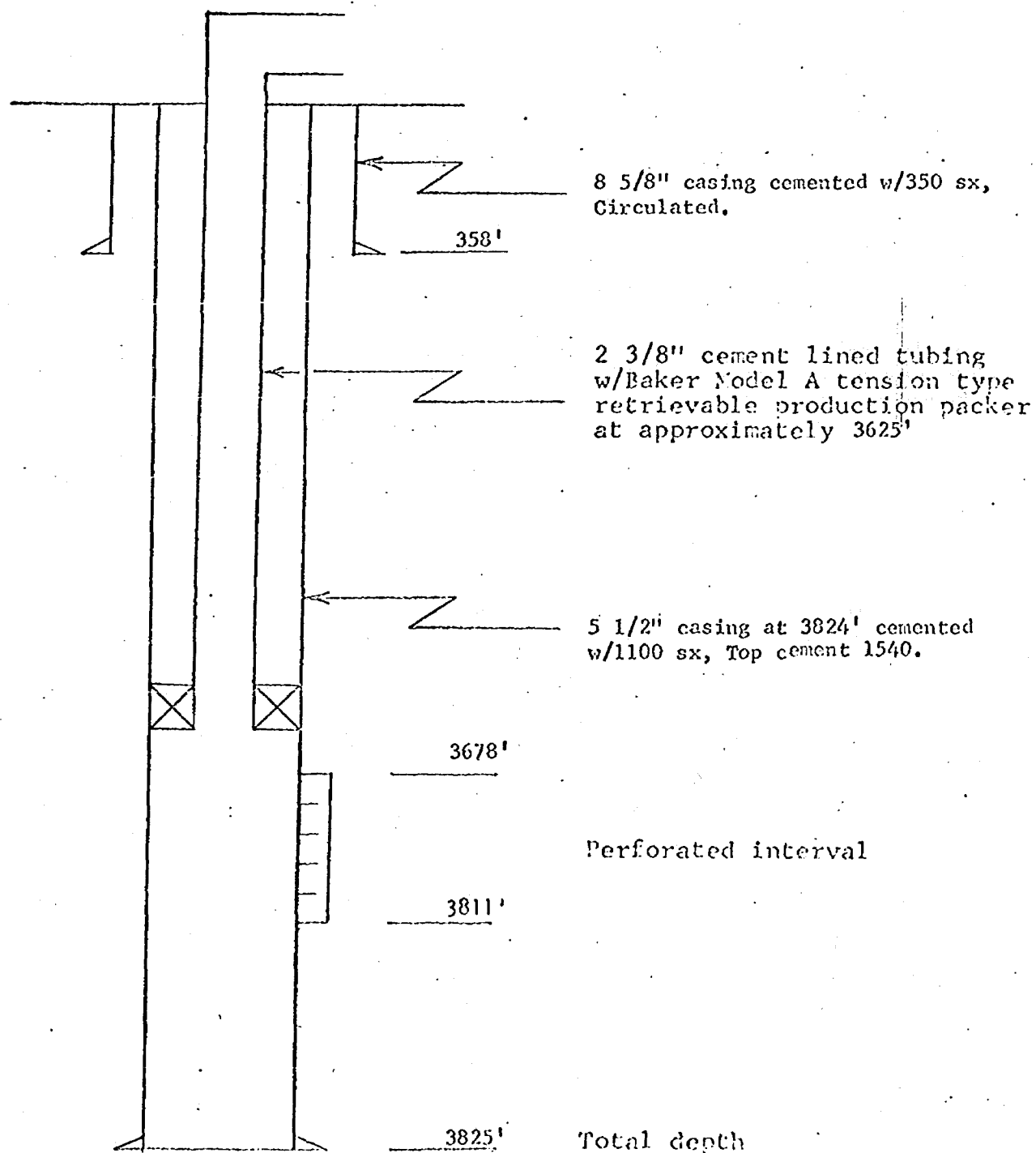


## Proposed Procedure

1. Rig up.
2. Tag bottom and tally out
3. If fill above 3796' clean out to 3810'.
4. Run tubing and set at approximately 3655'.

### Water Injection Well Data

CONTINENTAL OIL COMPANY  
MEYER B-22 No. 8  
2310' FSL & 1980' FWL, Unit K  
Section 22-22-36  
Elev: 3517' DF

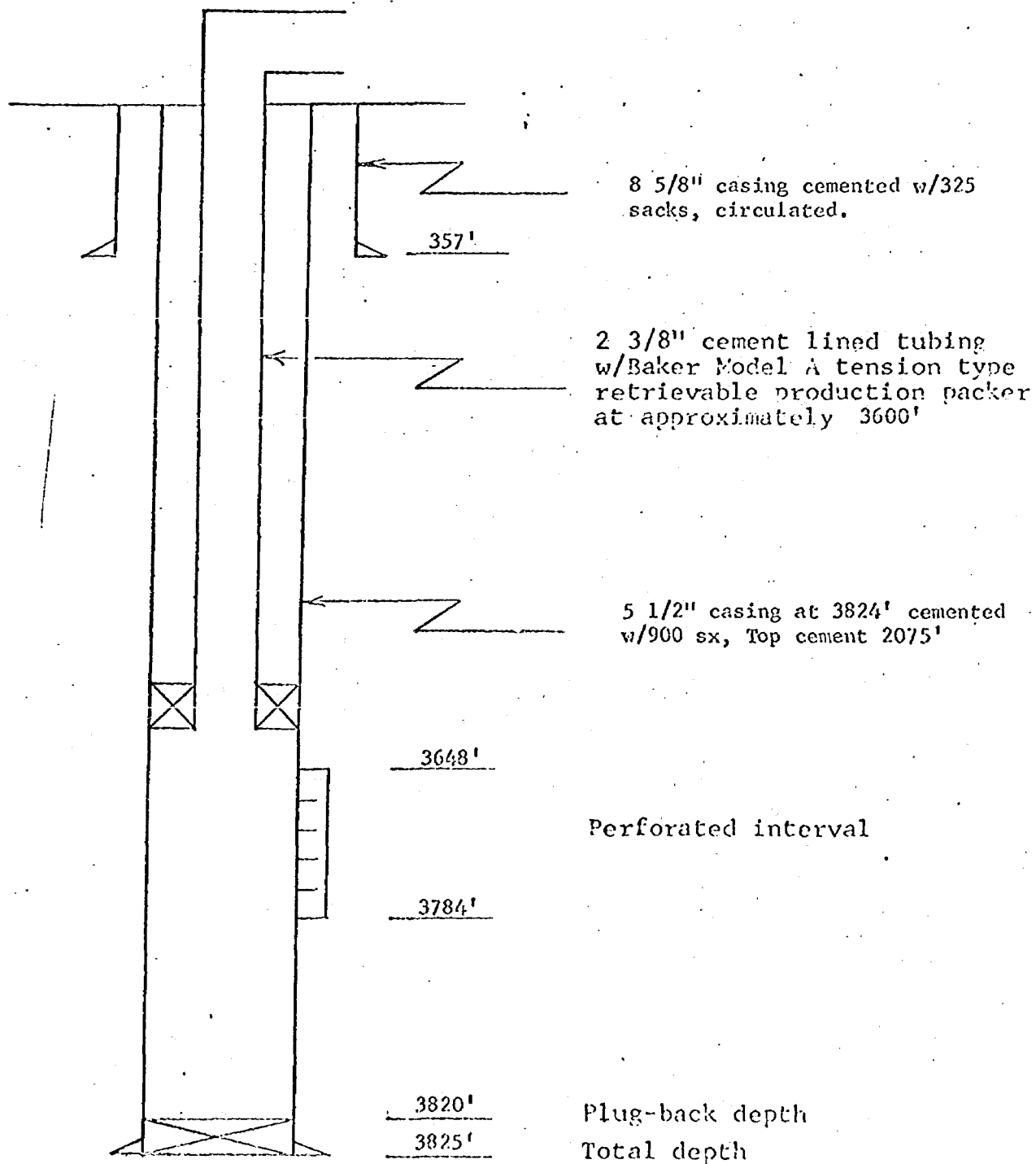


### Proposed Procedure

1. Rig up.
2. Tag bottom and tally out.
3. If fill above 3811' clean out to 3825' (TD).
4. Run tubing and set at approximately 3625'.

## Water Injection Well Data

CONTINENTAL OIL COMPANY  
Meyer B-22 No. 11  
1980' FSL & 660' FEL, Unit I  
Section 22-22-36  
Elev: 3523' DF



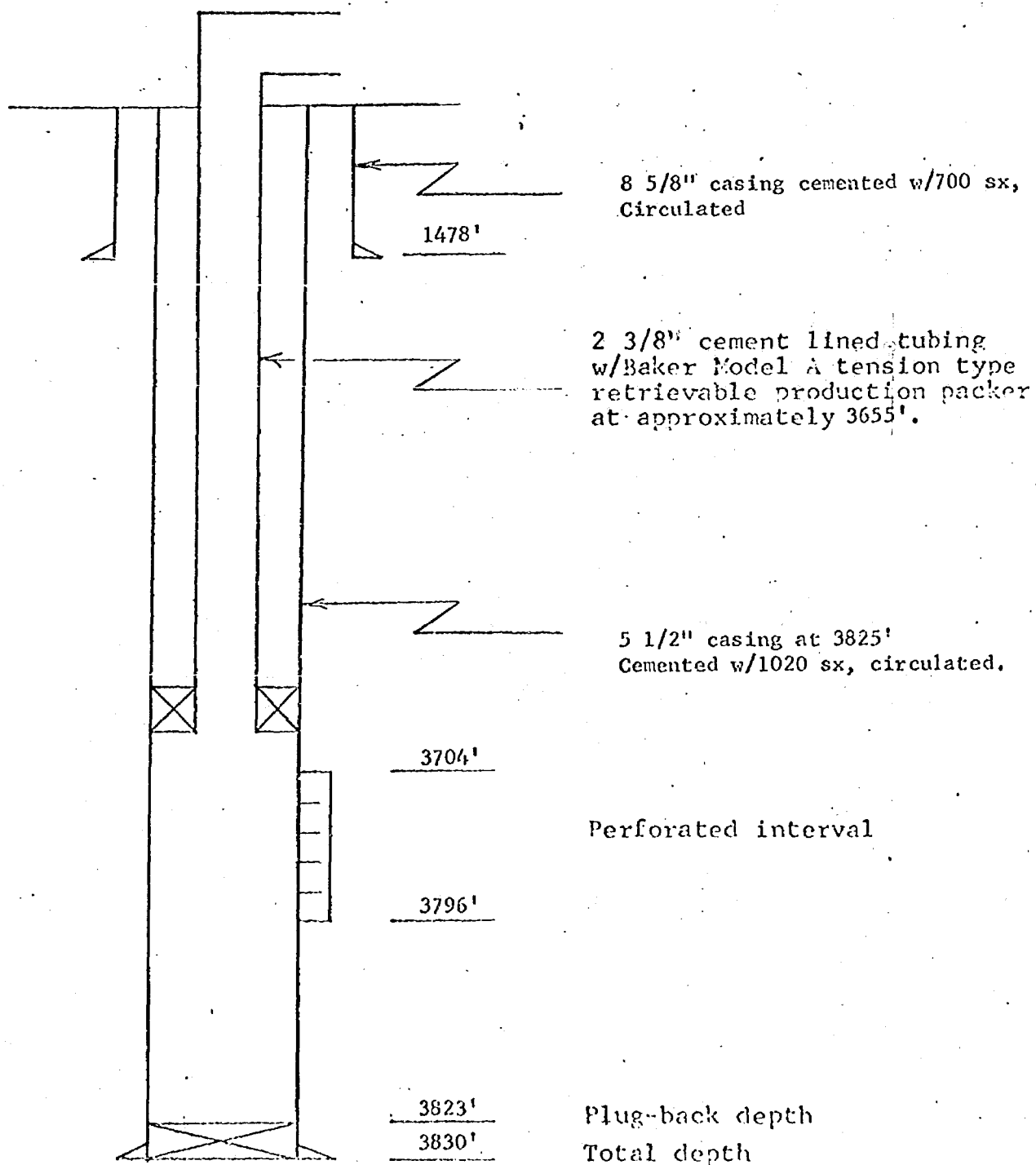
### Proposed Procedure

1. Rig up.
2. Tag bottom and tally out.
3. If fill above 3784' clean out to 3000'.
4. Run tubing and set at approximately 3600'.

Exhibit 4-14

## Water Injection Well Data

CONTINENTAL OIL COMPANY  
Meyer B-22 No. 5  
660' FSL & 660' FWL, Unit M  
Section 22-22-36  
Elev: 3514' DF



### Proposed Procedure

1. Rig up.
2. Tag bottom and tally out.
3. If fill above 3796' clean out to 3823' (PBD).
4. Run tubing and set at approximately 3655'.

Exhibit 4-15

## Water Injection Well Data

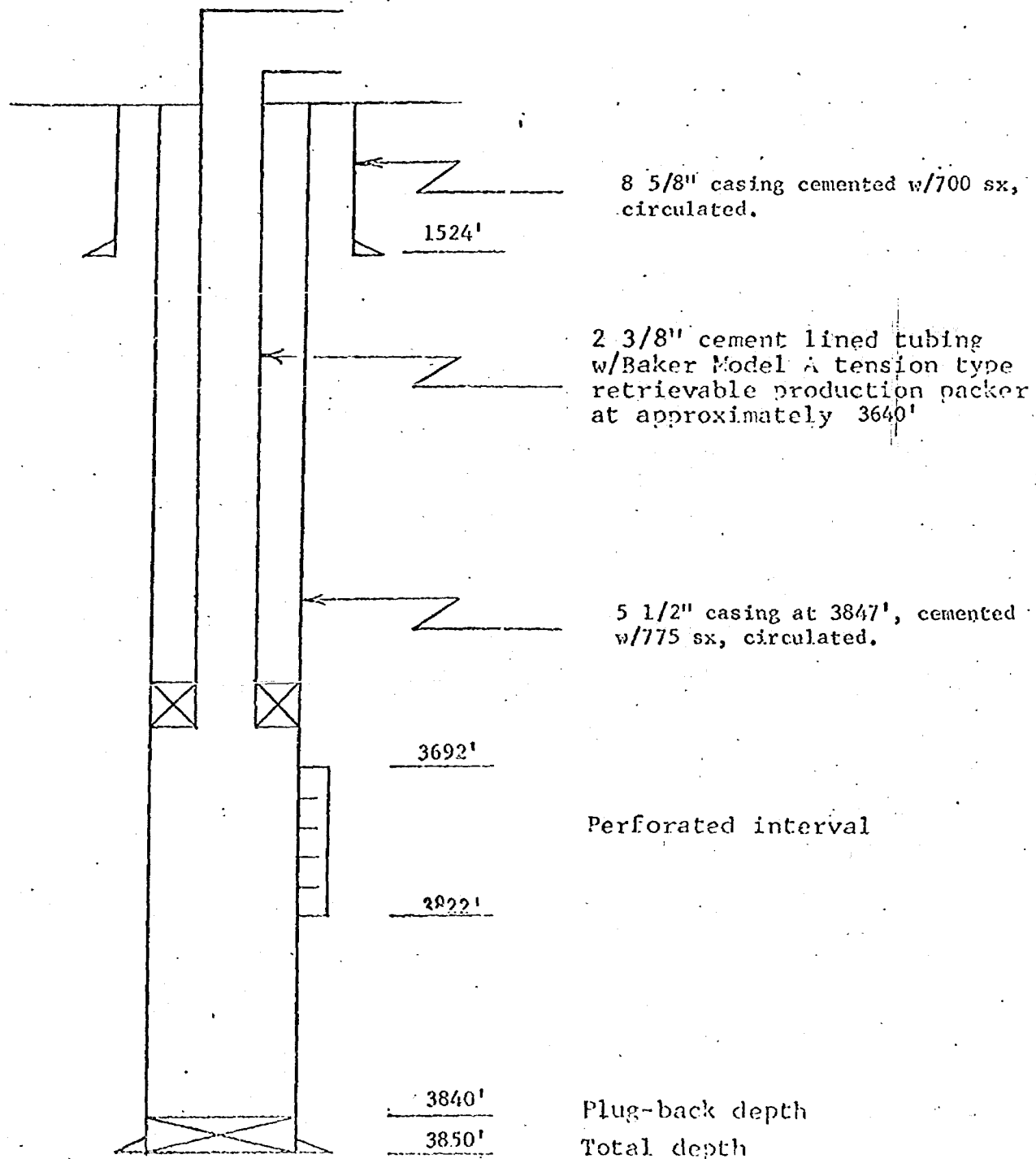
CONTINENTAL OIL COMPANY

Meyer B-22 No. 6

660' FSL & 1980' FEL, Unit O

Section 22-22-36

Elev: 3501' GL

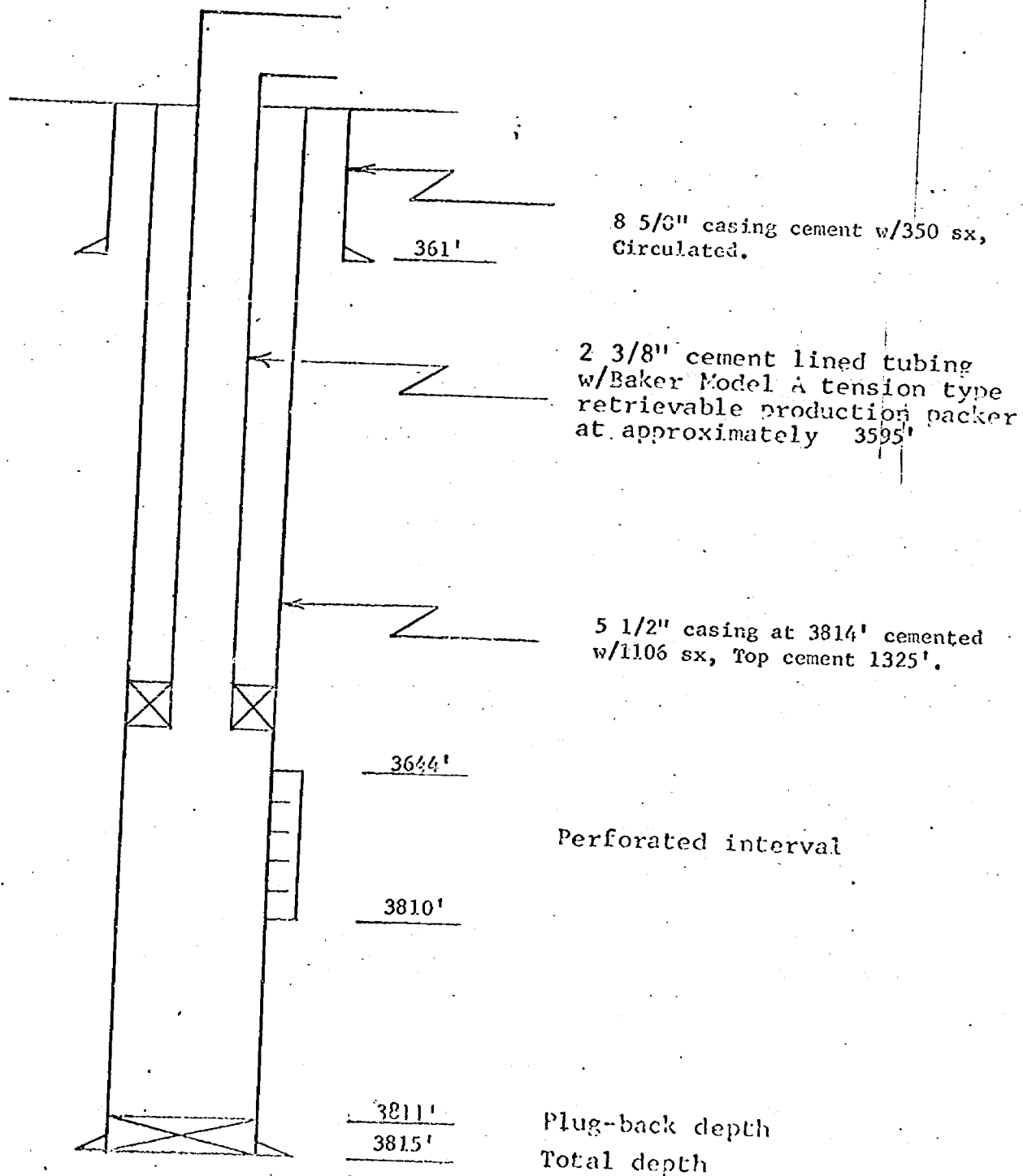


### Proposed Procedure

1. Rig up.
2. Tag bottom and tally out.
3. If fill above 3622' clean out to 3840' (PRF).
4. Run tubing and set at approximately 3640'.

# Water Injection Well Data

CONTINENTAL OIL COMPANY  
Meyer A-29 No. 6  
660' FNL & 660' FEL, Unit A  
Section 29-22-36  
Elev: 3542' DF

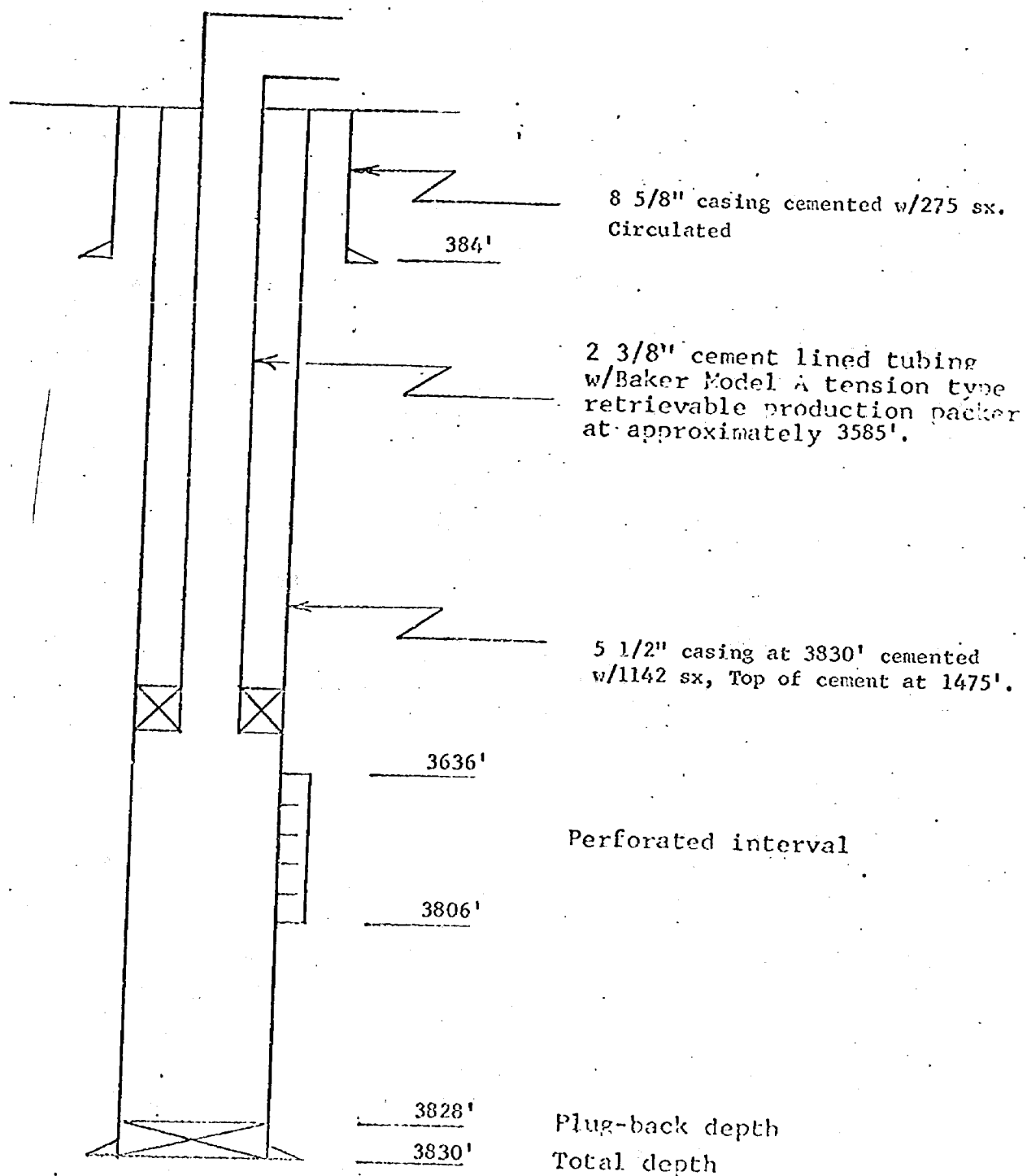


## Proposed Procedure

1. Rig up.
2. Tag bottom and tally out.
3. If fill above 3810' clean out to 3811' (PBD).
4. Run tubing and set at approximately 3595'.

## Water Injection Well Data

CONTINENTAL OIL COMPANY  
Meyer A-29 No. 8  
1980' FSL & 660' FEL, Unit I  
Section 29-22-36  
Elev. 3528' DF

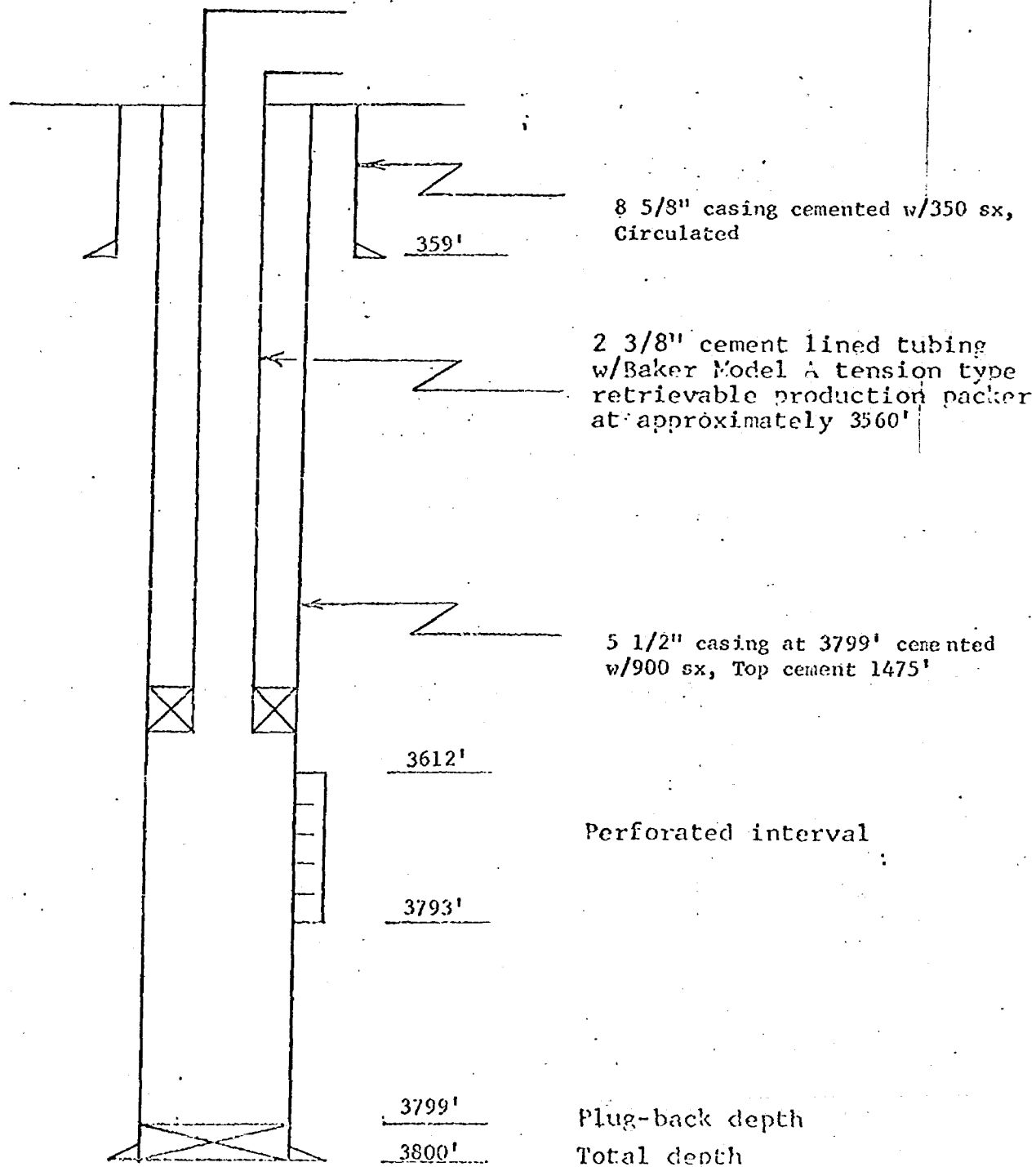


### Proposed Procedure

1. Rig up.
2. Tag bottom and tally out.
3. If fill above 3806' clean out to 3828'.
4. Run tubing and set at approximately 3585'.

# Water Injection Well Data

CONTINENTAL OIL COMPANY  
Meyer B-28 No. 7  
660' FNL & 1980' FWL, Unit C  
Section 28-22-36  
Elev: 3534' DF

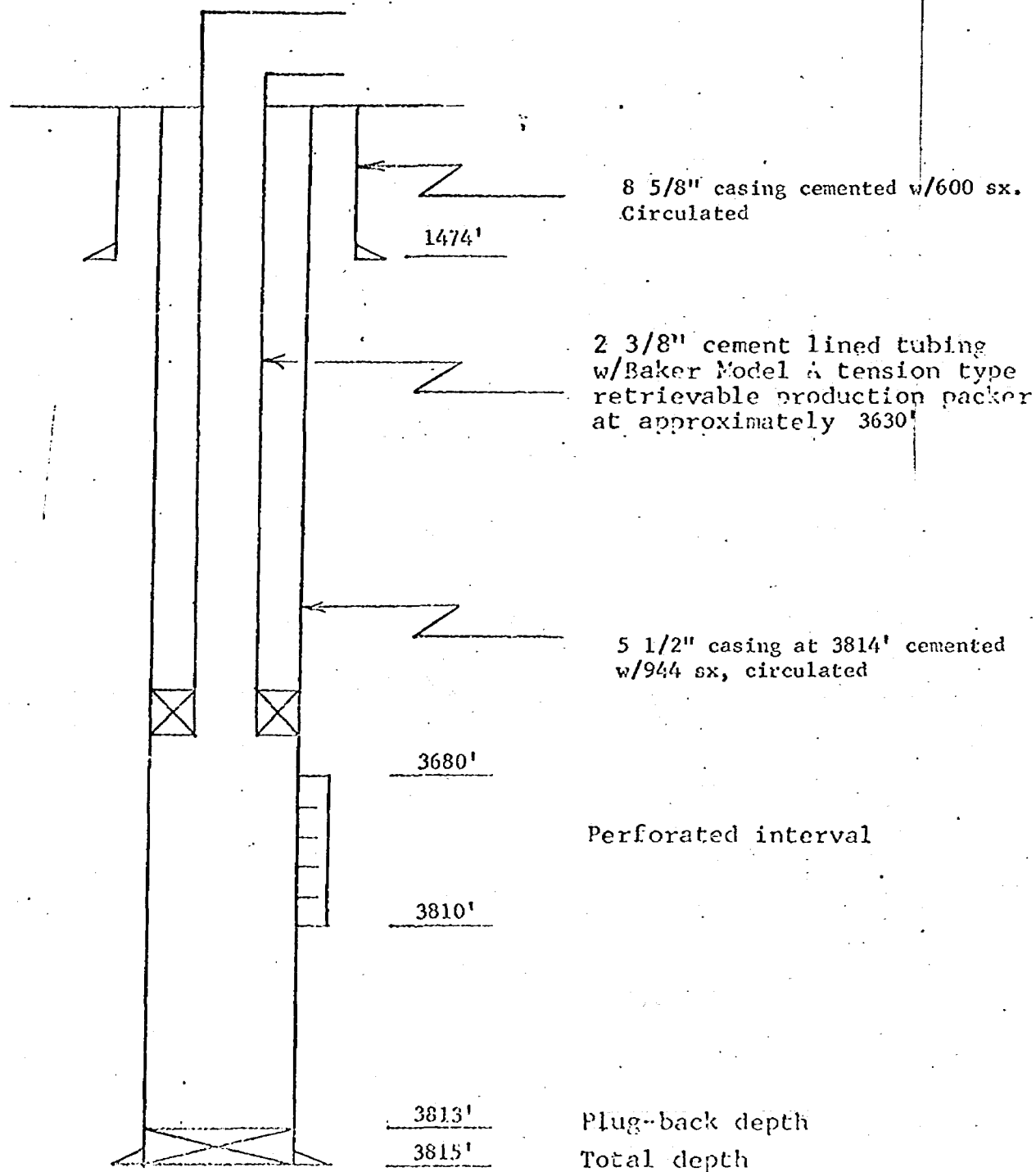


## Proposed Procedure

1. Rig up.
2. Tag bottom and tally out.
3. If fill above 3793' clean out to 3799' (PBF).
4. Run tubing and set at approximately 3560'.

## Water Injection Well Data

CONTINENTAL OIL COMPANY  
Meyer B-28 No. 3  
660' FNL & 660' FEL, Unit A  
Section 28-22-36  
Elev: 3517' DF



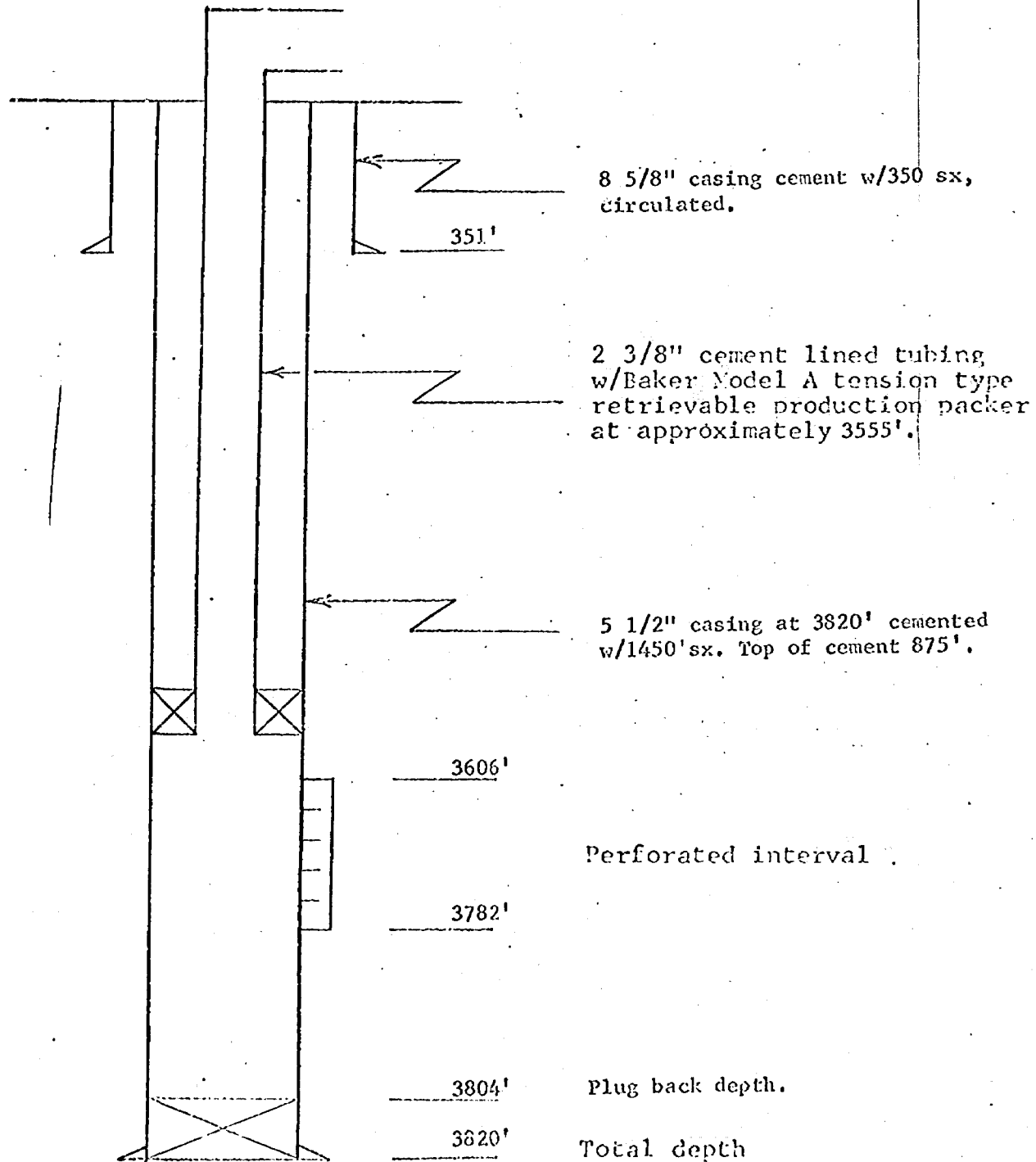
### Proposed Procedure

1. Rig up.
2. Tab bottom and tally out.
3. If fill above 3810' clean out to 3813' (PRD).
4. Run tubing and set at approximately 3630'.

Exhibit 4-20

# Water Injection Well Data

CONTINENTAL OIL COMPANY  
Meyer B-28 No. 10  
1980' FWL & 660' FWL, Unit E  
Section 28-22-36  
Elev: 3519' DF



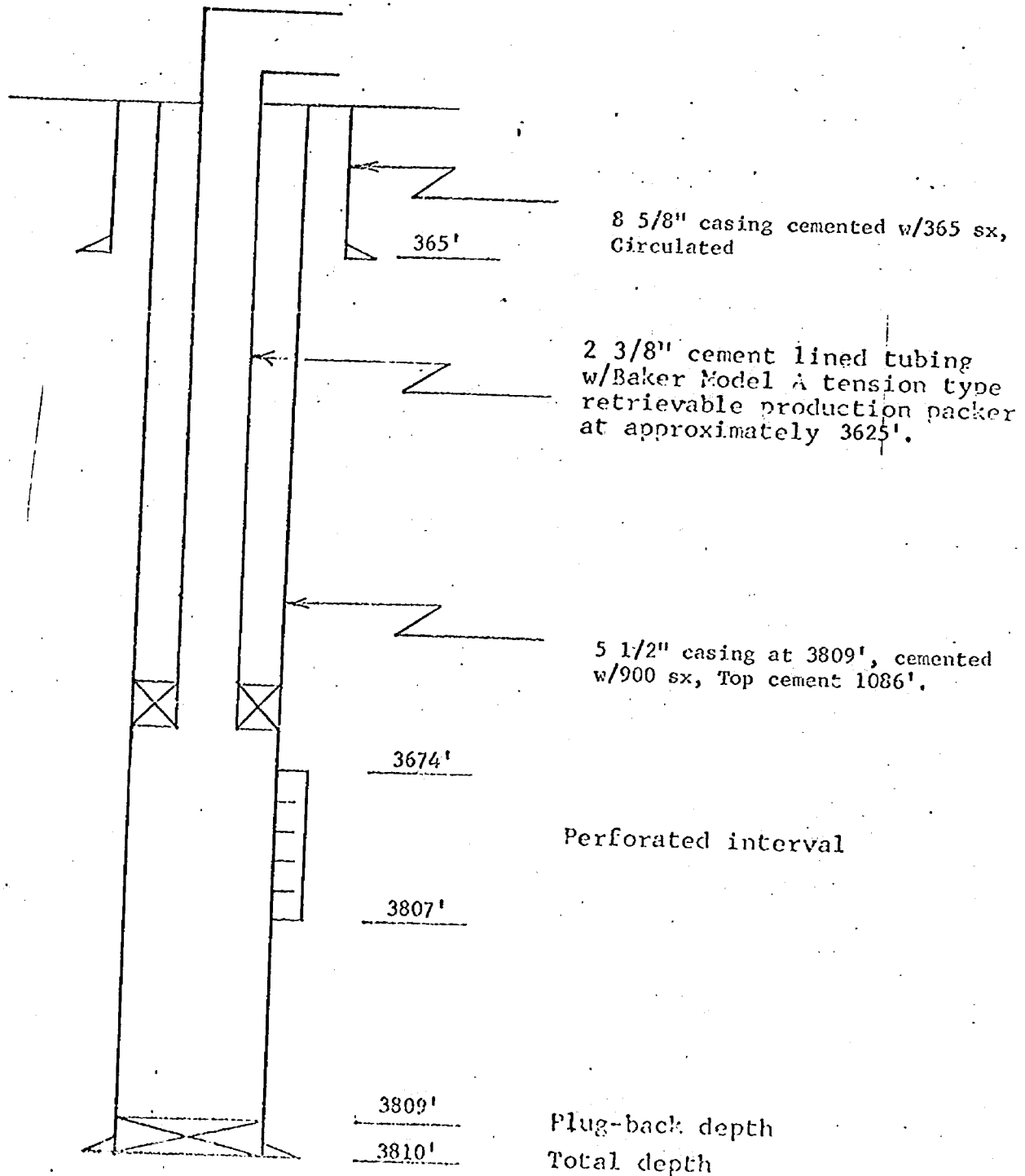
## Proposed Procedure

1. Rig up.
2. Tag bottom and tally out.
3. If fill above 3782' clean out to 3800'.
4. Run tubing and set, at approximately 3555'.

Exhibit 4-21

# Water Injection Well Data

CONTINENTAL OIL COMPANY  
Meyer B-28 No. 6  
1980' FNL & 1980' FEL, Unit G  
Section 28-22-36



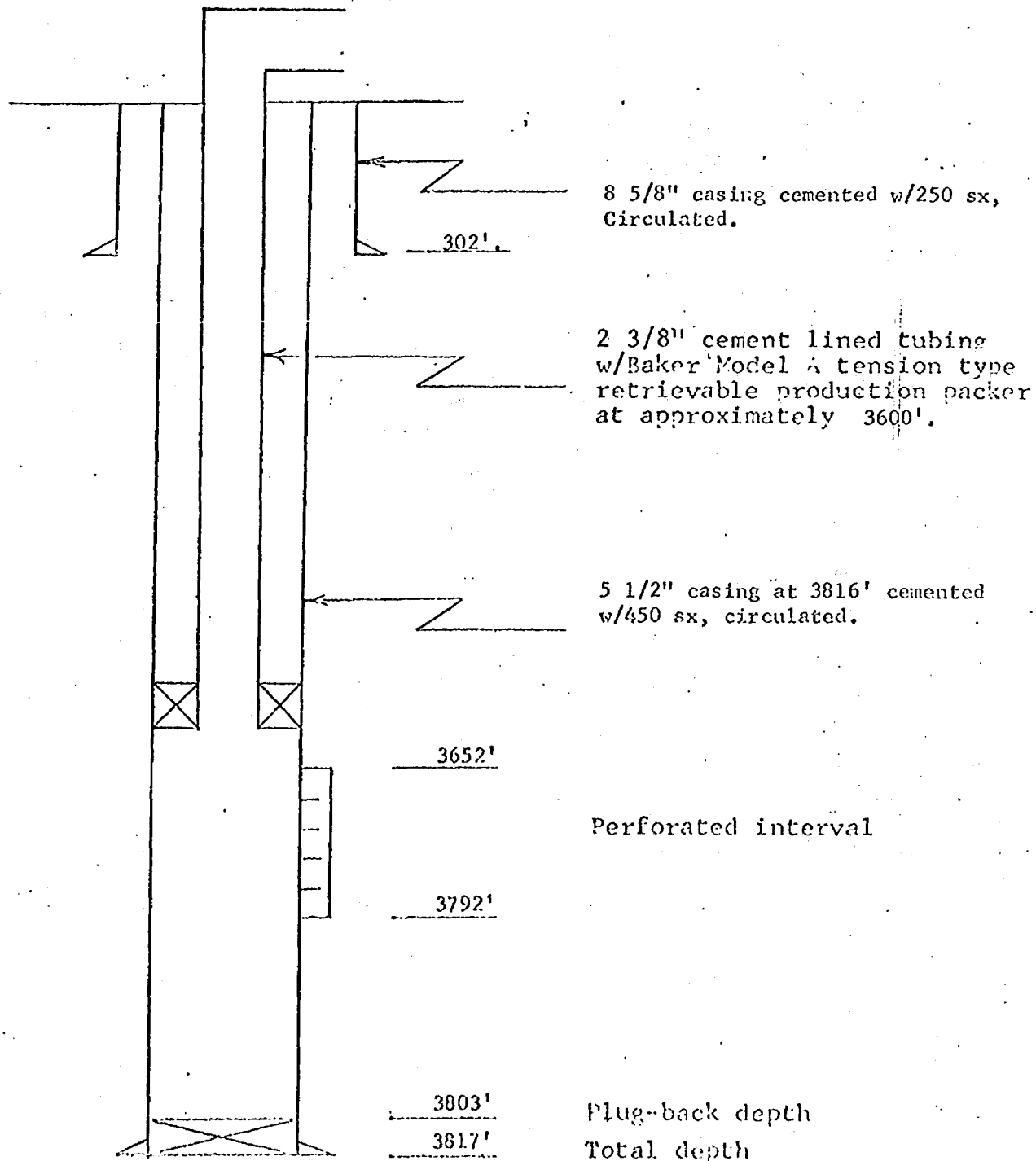
## Proposed Procedure

1. Rig up.
2. Tag bottom and tally out.
3. If fill above 3807' clean out to 3809' (PBD).
4. Run tubing and set at approximately 3625'.

Exhibit 4-22

### Water Injection Well Data

TEXAS PACIFIC COAL AND OIL COMPANY  
B. A. Christmas No. 7  
1980' FSL & 1980' FWL, Unit K  
Section 28-22-36  
Elev: 3521' DF

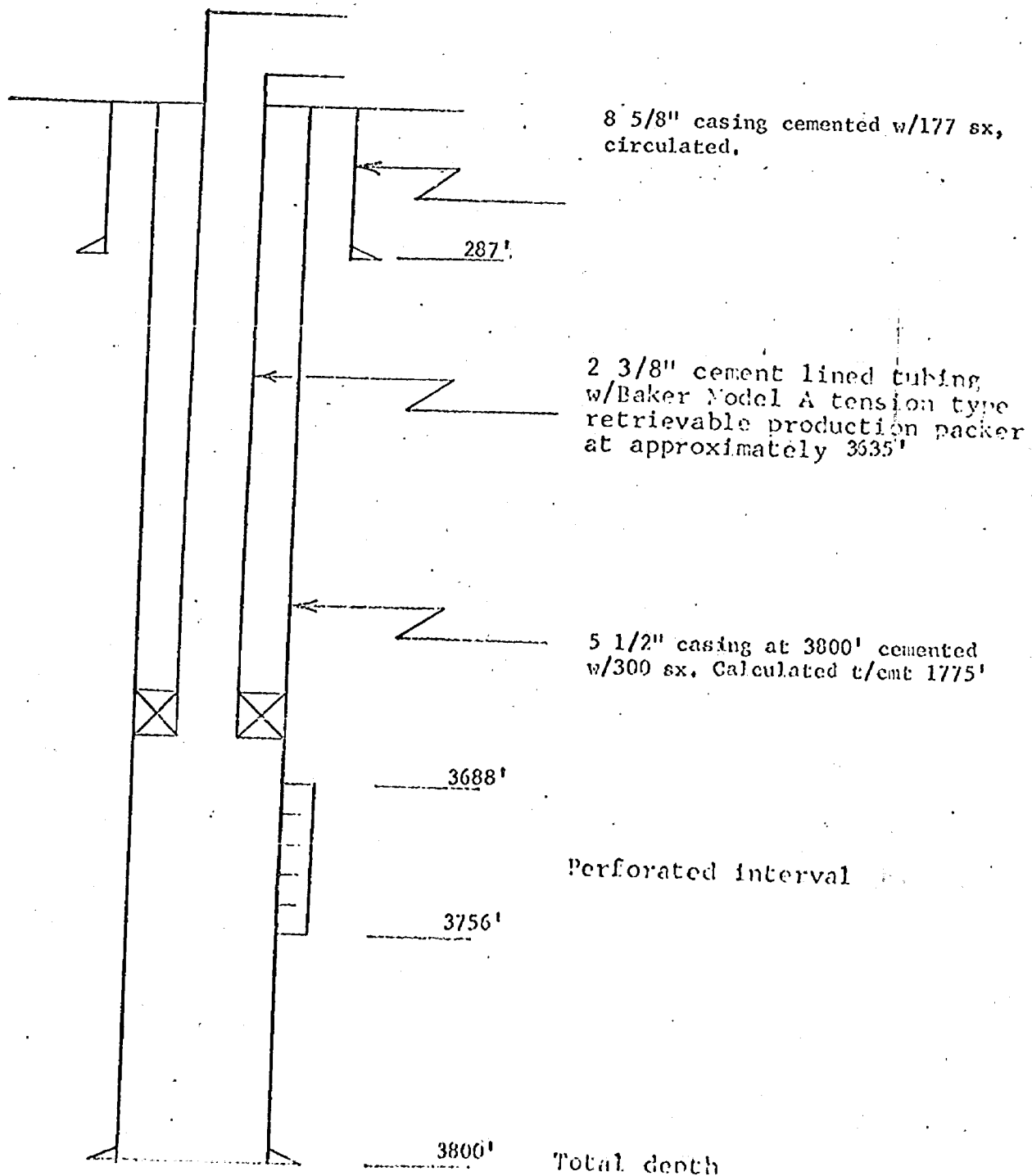


### Proposed Procedure

1. Rig up.
2. Tag bottom and tally out.
3. If fill above 3792' clean out to 3803' (PBD).
4. Run tubing and set at approximately 3600'.

### Water Injection Well Data

TEXAS PACIFIC OIL COMPANY  
B. A. Christmas No. 3  
2110' FSL & 330' FEL, Unit I  
Section 28-22-36  
Elev: 3500' DF



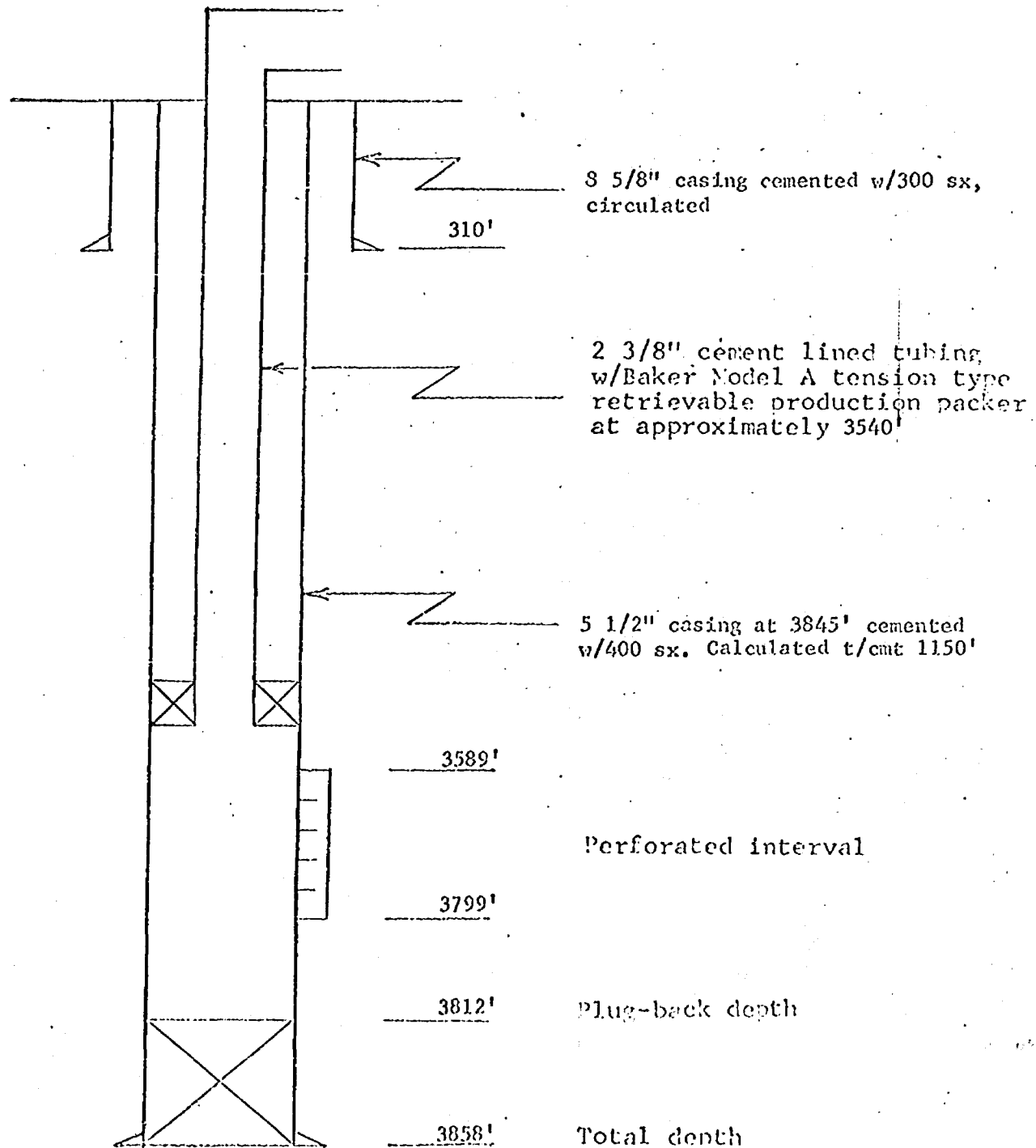
### Proposed Procedure

1. Rig up.
2. Tag bottom and tally out.
3. If fill above 3756' clean out to 3775'.
4. Put tubing and set at approximately 3635'.

Exhibit 4-24

### Water Injection Well Data

TEXAS PACIFIC COAL AND OIL COMPANY  
B. A. Christmas No. 8  
660' FSL & 660' FWL, Unit M  
Section 28-22-36  
Elev: 3509' DF

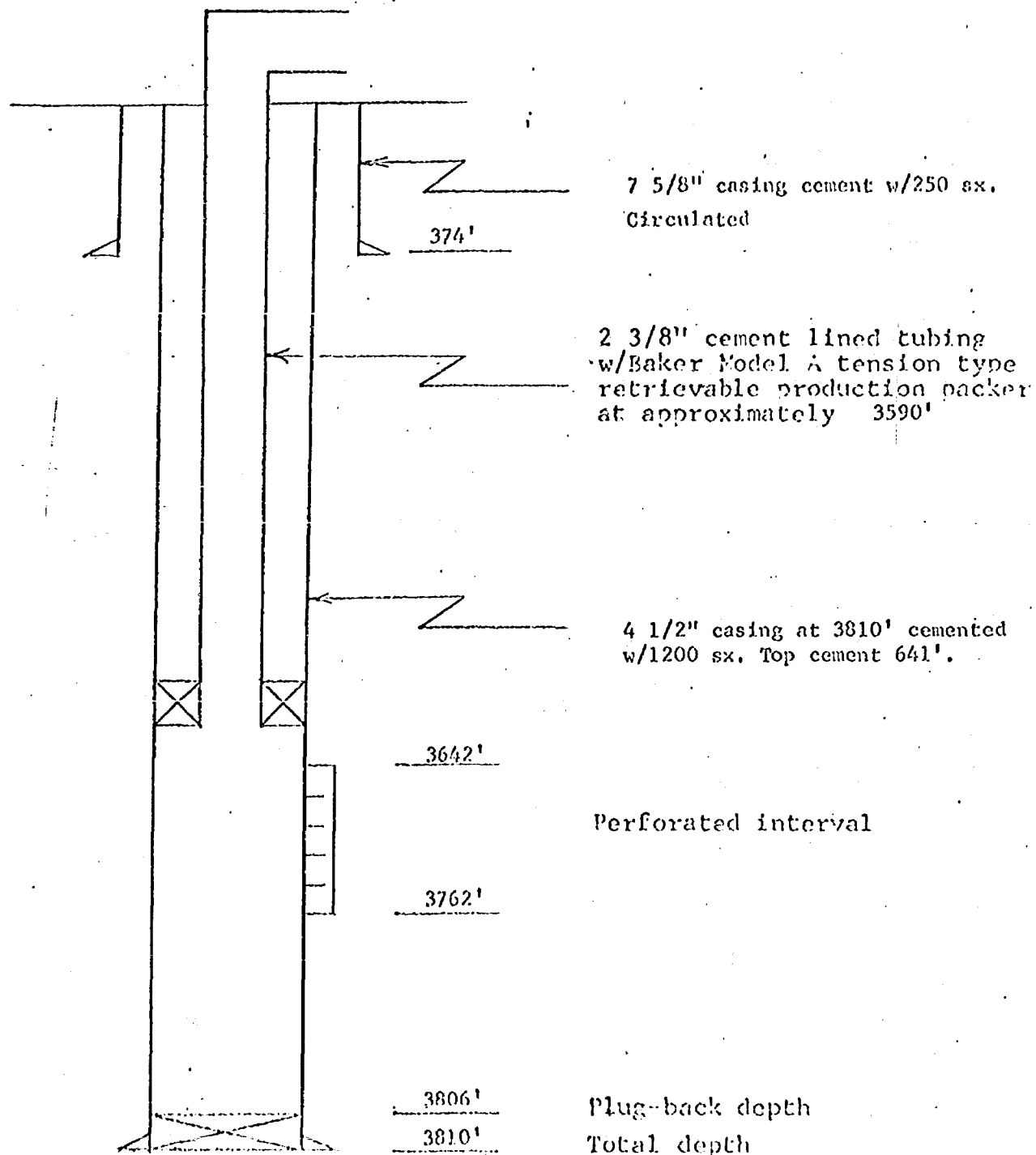


### Proposed Procedure

1. Rig up.
2. Tag bottom and tally out.
3. If fill above 3799' clean out to 3812' (PBD).
4. Run tubing and set at approximately 3540'.

## Water Injection Well Data

ATLANTIC RICHFIELD COMPANY  
J. L. Selby No. 4  
660' FNL & 660' FWL, Unit D  
Section 33-22-36  
Elev: 3492' DF



### Proposed Procedure

1. Rig up.
2. Tab bottom and tally out.
3. If fill above 3762' clean out to 3780'.
4. Run tubing and set at approximately 3590'.

Exhibit 4-26

### Water Injection Well Data

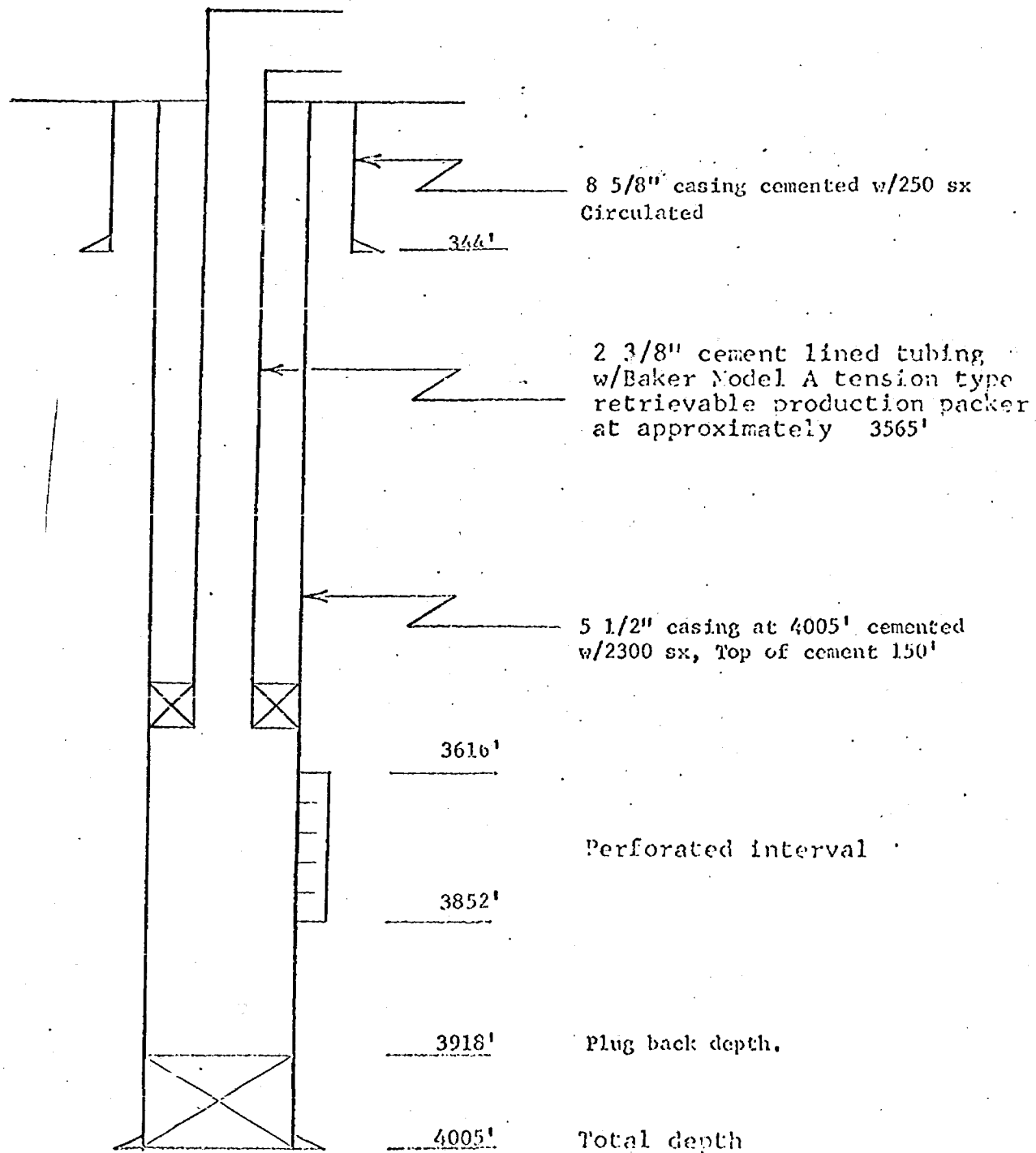
ALBERT GACKLE

H. E. Esmond No. 4

1980' FNL & 1980' FEL, Unit G

Section 33-22-36

Elevation: 3482' GL

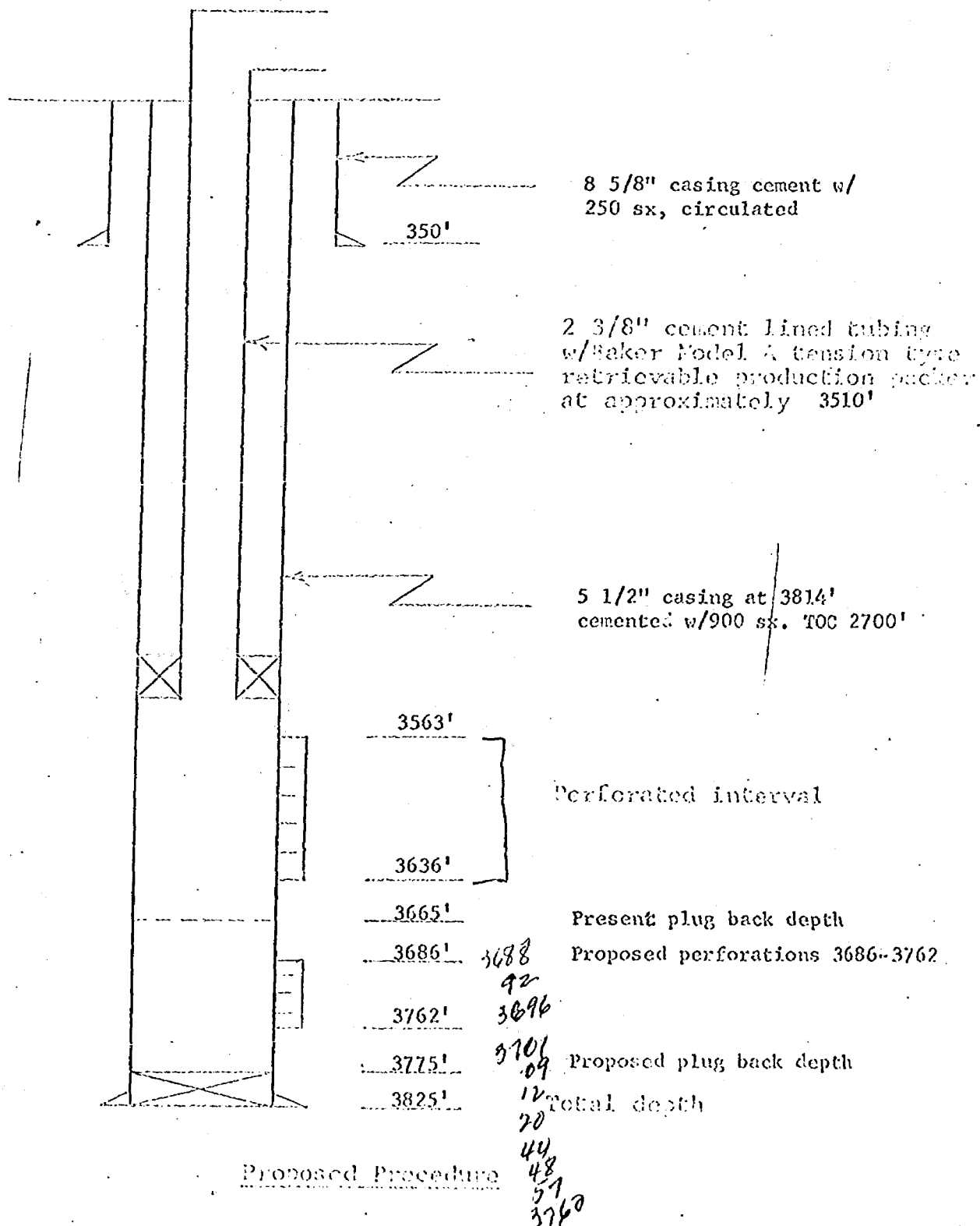


### Proposed Procedure

1. Rig up.
2. Tag bottom and tally out.
3. If fill above 3852' clean out to 3870'.
4. Run tubing and set at approximately 3565'.

# Water Injection Well Data

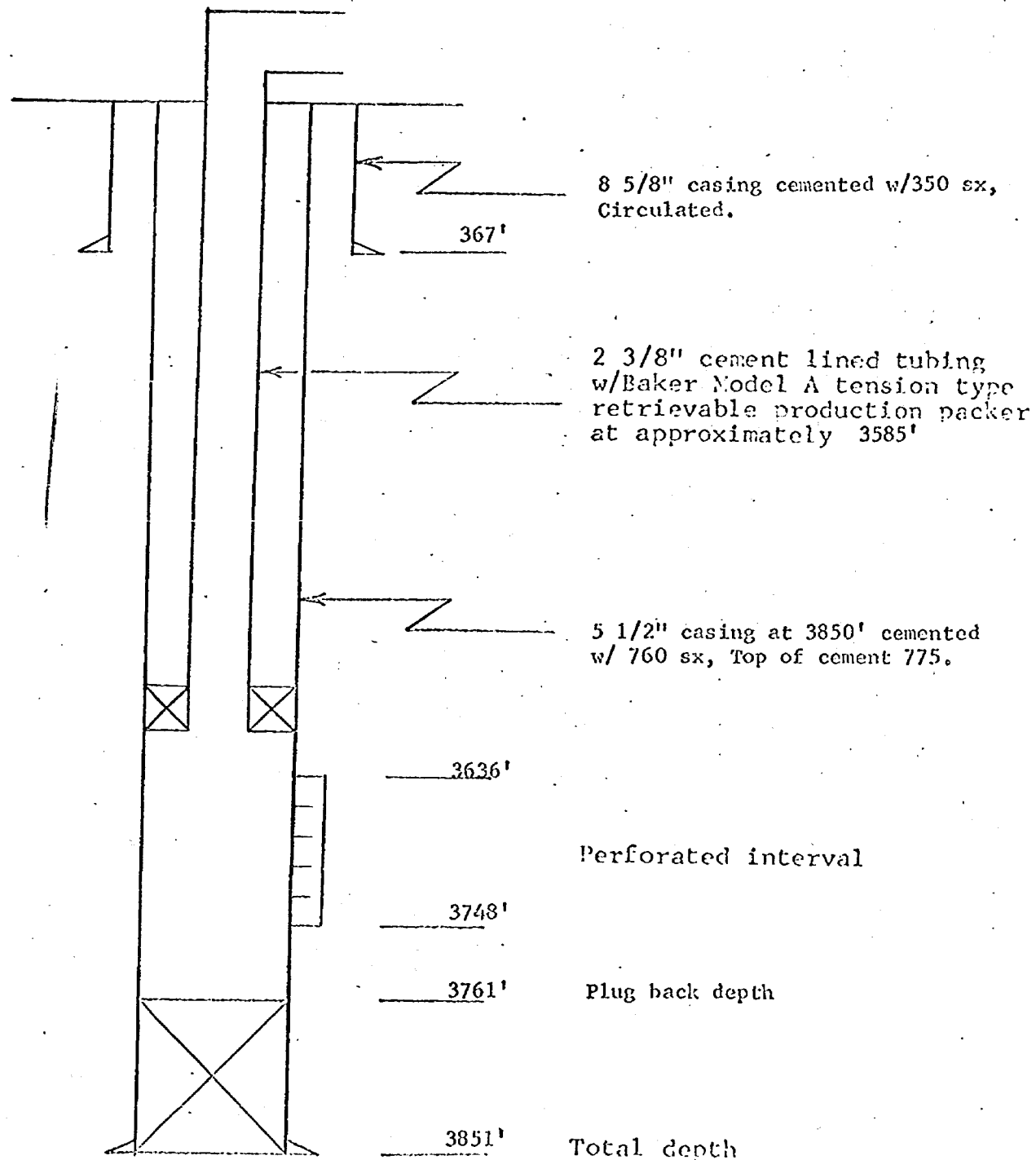
CONTINENTAL OIL COMPANY  
Meyer B-33 No. 9  
1980' FSL & 660' FWL, Unit L  
Section 33-22-36  
Elev: 3485 DF



1. Rig up.
2. Pull tubing.
3. Drill out to 3775'.
4. Perforate 3686-3702, 3710-22, 3742-46 & 3756-62.
5. Treat w/1000 gallons acid.
6. Run tubing and set at approximately 3510.

### Water Injection Well Data

CONTINENTAL OIL COMPANY  
Meyer B-33 No. 3  
1980' FSL & 660' FEL, Unit I  
Section 33-22-36  
Elev: 3495' DF

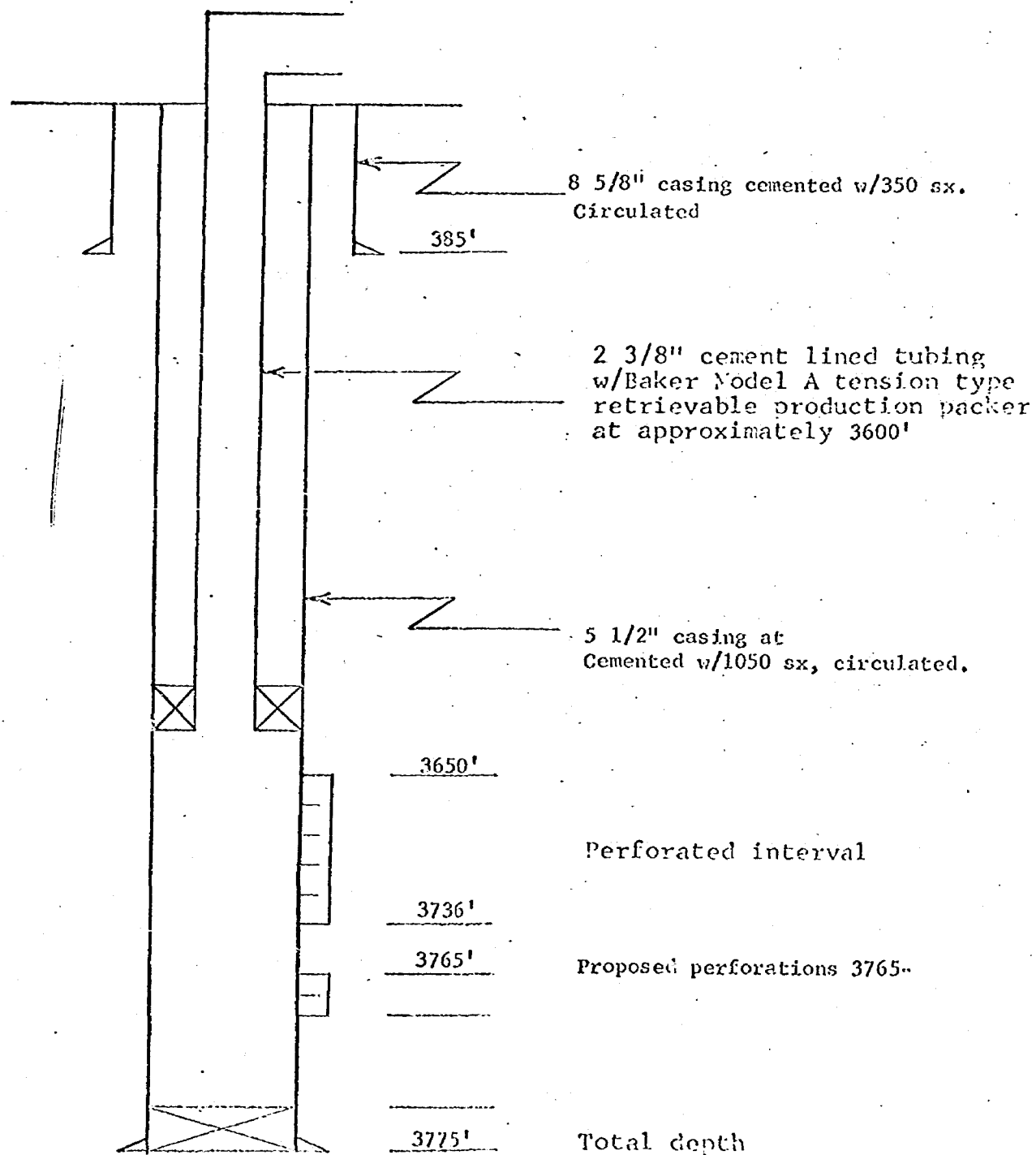


### Proposed Procedure

1. Rig up.
2. Tag bottom and tally out.
3. If fill above 3748' clean out to 3761' (PPD).
4. Run tubing and set at approximately 3585'.

### Water Injection Well Data

CONTINENTAL OIL COMPANY  
Meyer B-33 No. 8  
660' FSL & 1980' FWL, Unit N  
Section 33-22-36  
Elev: 3477 GL



### Proposed Procedure

1. Pig up.
2. Tag bottom and tally out.
3. If any fill, clean out to 3774' (PBD).
4. Perforate 3765'-3770'.
5. Treat 3765'-3775' w/1000 gallons acid.
6. Run tubing and set at approximately 3600'.

[illegible]





1997-1998 2000-2001

[illegible]

EXHIBIT 5-5

Stressors are defined as any event or condition that is perceived as a challenge or demand that exceeds the individual's resources and coping abilities (Lazarus & Folkman, 1984). Stressors are the external events or conditions that trigger the stress response. They can be categorized into various types, including acute stressors, chronic stressors, and eustress (positive stress). Acute stressors are short-lived events that cause immediate stress, such as a car accident or a sudden job loss. Chronic stressors are long-lasting conditions that cause ongoing stress, such as a chronic illness or a difficult relationship. Eustress is a positive stress response that can lead to personal growth and improved performance. It is often experienced in situations that are challenging but manageable, such as a new job or a difficult task. Stressors can have a significant impact on an individual's health and well-being. They can lead to physical symptoms such as headaches, fatigue, and insomnia, as well as psychological symptoms such as anxiety, depression, and irritability. Understanding stressors and their effects is the first step in developing effective stress management strategies.

EXHIBIT 5-6





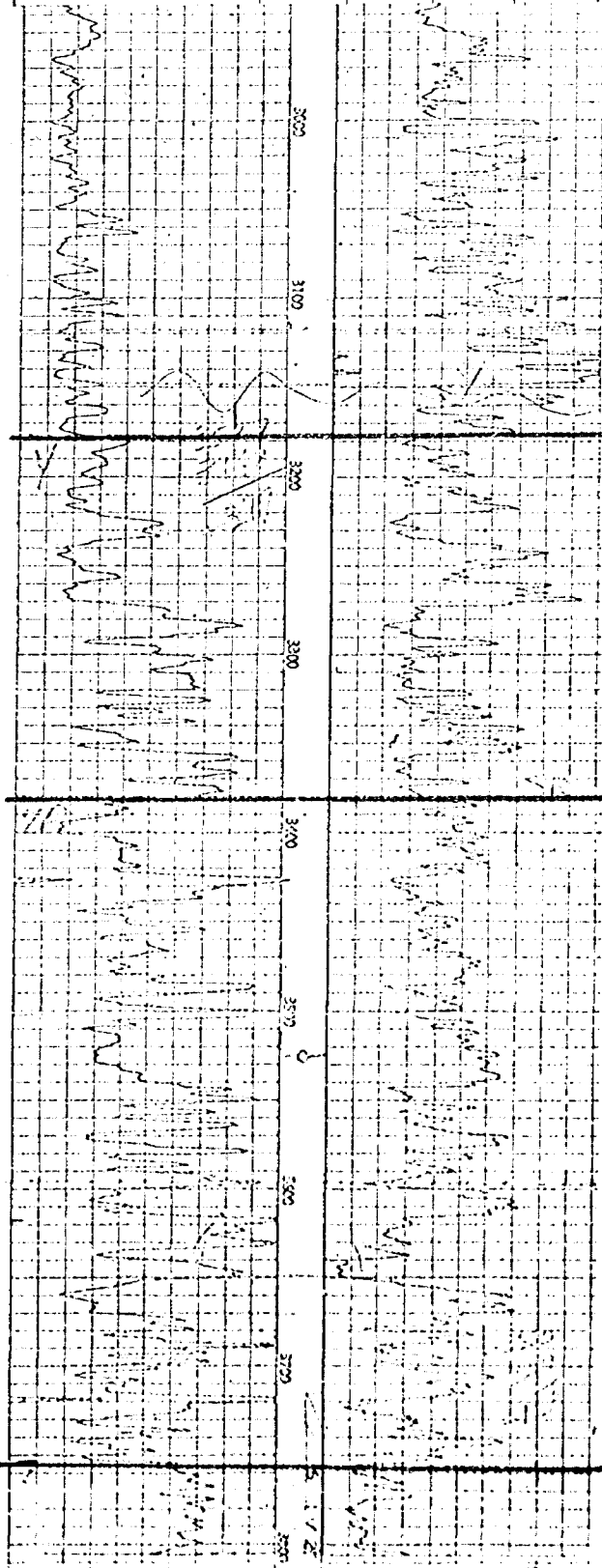
3. *What is the purpose of the study?*

The figure consists of two scatter plots. The left plot shows a positive correlation between the number of children and the number of adults, with a regression line. The right plot shows a negative correlation between the number of children and the number of adults, with a regression line.

100

LANE RADIOACTIVITY LOG WELLS  
COMPANY

LOG NO. 101 DATE 10-10-60 TOTAL DEPTH (DRILLER) 101 EFFECTIVE DEPTH (DRILLER) 101 TOP OF LOGGED INTERVAL 101 BOTTOM OF LOGGED INTERVAL 101 TYPE OF FLUID IN HOLE 101 FLUID LEVEL 101 MAXIMUM RECORDED TEMP. 101 NEUTRON SOURCE STRENGTH & TYPE 101 SOURCE SPACING -- IN. 101 LENGTH OF WEARING DEVICE -- IN. 101 MOD OF INSTRUMENT -- IN. 101 TIME CONSTANT -- SECONDS 101 LOGGING SPEED FT. MIN. 101 STATISTICAL VARIATION -- IN. 101 SENSITIVITY REFERENCE 101 RECORDED BY 101 WITNESSED BY 101		LOG NO. 102 DATE 10-10-60 TOTAL DEPTH (DRILLER) 102 EFFECTIVE DEPTH (DRILLER) 102 TOP OF LOGGED INTERVAL 102 BOTTOM OF LOGGED INTERVAL 102 TYPE OF FLUID IN HOLE 102 FLUID LEVEL 102 MAXIMUM RECORDED TEMP. 102 NEUTRON SOURCE STRENGTH & TYPE 102 SOURCE SPACING -- IN. 102 LENGTH OF WEARING DEVICE -- IN. 102 MOD OF INSTRUMENT -- IN. 102 TIME CONSTANT -- SECONDS 102 LOGGING SPEED FT. MIN. 102 STATISTICAL VARIATION -- IN. 102 SENSITIVITY REFERENCE 102 RECORDED BY 102 WITNESSED BY 102		LOG NO. 103 DATE 10-10-60 TOTAL DEPTH (DRILLER) 103 EFFECTIVE DEPTH (DRILLER) 103 TOP OF LOGGED INTERVAL 103 BOTTOM OF LOGGED INTERVAL 103 TYPE OF FLUID IN HOLE 103 FLUID LEVEL 103 MAXIMUM RECORDED TEMP. 103 NEUTRON SOURCE STRENGTH & TYPE 103 SOURCE SPACING -- IN. 103 LENGTH OF WEARING DEVICE -- IN. 103 MOD OF INSTRUMENT -- IN. 103 TIME CONSTANT -- SECONDS 103 LOGGING SPEED FT. MIN. 103 STATISTICAL VARIATION -- IN. 103 SENSITIVITY REFERENCE 103 RECORDED BY 103 WITNESSED BY 103		LOG NO. 104 DATE 10-10-60 TOTAL DEPTH (DRILLER) 104 EFFECTIVE DEPTH (DRILLER) 104 TOP OF LOGGED INTERVAL 104 BOTTOM OF LOGGED INTERVAL 104 TYPE OF FLUID IN HOLE 104 FLUID LEVEL 104 MAXIMUM RECORDED TEMP. 104 NEUTRON SOURCE STRENGTH & TYPE 104 SOURCE SPACING -- IN. 104 LENGTH OF WEARING DEVICE -- IN. 104 MOD OF INSTRUMENT -- IN. 104 TIME CONSTANT -- SECONDS 104 LOGGING SPEED FT. MIN. 104 STATISTICAL VARIATION -- IN. 104 SENSITIVITY REFERENCE 104 RECORDED BY 104 WITNESSED BY 104		LOG NO. 105 DATE 10-10-60 TOTAL DEPTH (DRILLER) 105 EFFECTIVE DEPTH (DRILLER) 105 TOP OF LOGGED INTERVAL 105 BOTTOM OF LOGGED INTERVAL 105 TYPE OF FLUID IN HOLE 105 FLUID LEVEL 105 MAXIMUM RECORDED TEMP. 105 NEUTRON SOURCE STRENGTH & TYPE 105 SOURCE SPACING -- IN. 105 LENGTH OF WEARING DEVICE -- IN. 105 MOD OF INSTRUMENT -- IN. 105 TIME CONSTANT -- SECONDS 105 LOGGING SPEED FT. MIN. 105 STATISTICAL VARIATION -- IN. 105 SENSITIVITY REFERENCE 105 RECORDED BY 105 WITNESSED BY 105		LOG NO. 106 DATE 10-10-60 TOTAL DEPTH (DRILLER) 106 EFFECTIVE DEPTH (DRILLER) 106 TOP OF LOGGED INTERVAL 106 BOTTOM OF LOGGED INTERVAL 106 TYPE OF FLUID IN HOLE 106 FLUID LEVEL 106 MAXIMUM RECORDED TEMP. 106 NEUTRON SOURCE STRENGTH & TYPE 106 SOURCE SPACING -- IN. 106 LENGTH OF WEARING DEVICE -- IN. 106 MOD OF INSTRUMENT -- IN. 106 TIME CONSTANT -- SECONDS 106 LOGGING SPEED FT. MIN. 106 STATISTICAL VARIATION -- IN. 106 SENSITIVITY REFERENCE 106 RECORDED BY 106 WITNESSED BY 106		LOG NO. 107 DATE 10-10-60 TOTAL DEPTH (DRILLER) 107 EFFECTIVE DEPTH (DRILLER) 107 TOP OF LOGGED INTERVAL 107 BOTTOM OF LOGGED INTERVAL 107 TYPE OF FLUID IN HOLE 107 FLUID LEVEL 107 MAXIMUM RECORDED TEMP. 107 NEUTRON SOURCE STRENGTH & TYPE 107 SOURCE SPACING -- IN. 107 LENGTH OF WEARING DEVICE -- IN. 107 MOD OF INSTRUMENT -- IN. 107 TIME CONSTANT -- SECONDS 107 LOGGING SPEED FT. MIN. 107 STATISTICAL VARIATION -- IN. 107 SENSITIVITY REFERENCE 107 RECORDED BY 107 WITNESSED BY 107		LOG NO. 108 DATE 10-10-60 TOTAL DEPTH (DRILLER) 108 EFFECTIVE DEPTH (DRILLER) 108 TOP OF LOGGED INTERVAL 108 BOTTOM OF LOGGED INTERVAL 108 TYPE OF FLUID IN HOLE 108 FLUID LEVEL 108 MAXIMUM RECORDED TEMP. 108 NEUTRON SOURCE STRENGTH & TYPE 108 SOURCE SPACING -- IN. 108 LENGTH OF WEARING DEVICE -- IN. 108 MOD OF INSTRUMENT -- IN. 108 TIME CONSTANT -- SECONDS 108 LOGGING SPEED FT. MIN. 108 STATISTICAL VARIATION -- IN. 108 SENSITIVITY REFERENCE 108 RECORDED BY 108 WITNESSED BY 108		LOG NO. 109 DATE 10-10-60 TOTAL DEPTH (DRILLER) 109 EFFECTIVE DEPTH (DRILLER) 109 TOP OF LOGGED INTERVAL 109 BOTTOM OF LOGGED INTERVAL 109 TYPE OF FLUID IN HOLE 109 FLUID LEVEL 109 MAXIMUM RECORDED TEMP. 109 NEUTRON SOURCE STRENGTH & TYPE 109 SOURCE SPACING -- IN. 109 LENGTH OF WEARING DEVICE -- IN. 109 MOD OF INSTRUMENT -- IN. 109 TIME CONSTANT -- SECONDS 109 LOGGING SPEED FT. MIN. 109 STATISTICAL VARIATION -- IN. 109 SENSITIVITY REFERENCE 109 RECORDED BY 109 WITNESSED BY 109		LOG NO. 110 DATE 10-10-60 TOTAL DEPTH (DRILLER) 110 EFFECTIVE DEPTH (DRILLER) 110 TOP OF LOGGED INTERVAL 110 BOTTOM OF LOGGED INTERVAL 110 TYPE OF FLUID IN HOLE 110 FLUID LEVEL 110 MAXIMUM RECORDED TEMP. 110 NEUTRON SOURCE STRENGTH & TYPE 110 SOURCE SPACING -- IN. 110 LENGTH OF WEARING DEVICE -- IN. 110 MOD OF INSTRUMENT -- IN. 110 TIME CONSTANT -- SECONDS 110 LOGGING SPEED FT. MIN. 110 STATISTICAL VARIATION -- IN. 110 SENSITIVITY REFERENCE 110 RECORDED BY 110 WITNESSED BY 110	
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GEO. SUTHER  
ROSWELL LVL.  
S. W. REGION

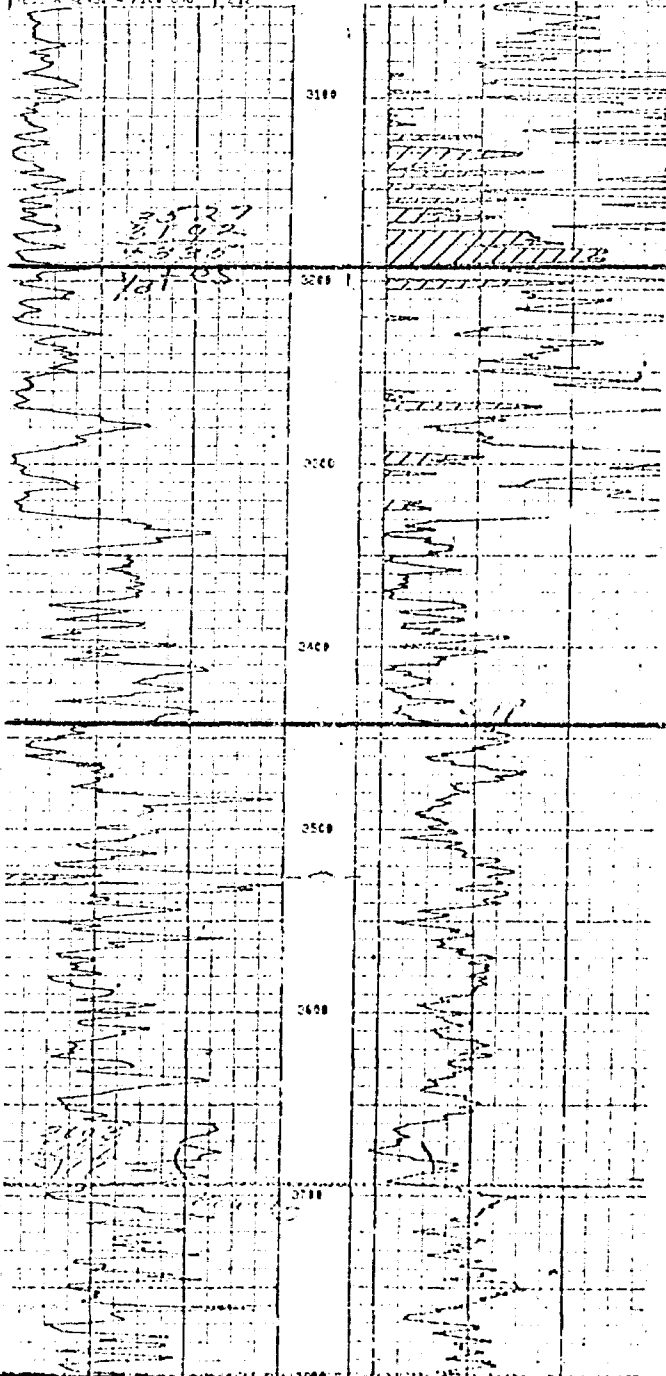
22-22-56

WELL NO. 10000

Simultaneous

# Radiation Log

LOG NO.	15512	COMPANY	SUN OIL COMPANY
STATION	MOISS	WELL	WELL RECORD # 6
INSTR. NO.	CD-22	FIELD	MOUTH ELNICE
SUN OIL COMPANY WELL FIELD COUNTY STATE	MOISS RECORD # 6 SOUTH ELNICE LEA NEW MEXICO	COUNTRY	LEA, NEW MEXICO
		STATE	LEA, NEW MEXICO
		LOCATION	1050' FAL. 100' FAL. 100' FAL.
		LOG DEPTH FROM	1' ABOVE G.L.
		DEPT. VERT. FROM	1' ABOVE G.L.
PERMANENT DATUM G.L.		ELEV. 3514	
CASING RECORD		BORE HOLE RECORD	
SIZE - 1" FROM		FIT SIZE - 1" FROM	
5 1/2 145		7 7/8	
TYPE OF LOG		GAMMA RAY - NEUTRON	
DATE		6-1-57	
TOTAL DEPTH - DRILLER		3514	
TOTAL DEPTH - P.C.A.C.		3514	
FIELD IN HOLE		WATER	
FIELD LEVEL			
MAXIMUM TEMPERATURE °F.		3 5/8 - 287	
INSTRUMENT O.D. AND NO.		7 - PH - 175	
INSTRUMENT TYPE		RB - 690	
NEUTRON SOURCE TYPE		150	
GPS FOR CALIB. STD. - CR		212	
REGUL. CENS. 4-1/100 SHU			



GEO. SECTION  
ROSWELL DIV.  
S. W. REGION

22-22-36

Simultaneous

Radiation Log

LOG NO. 1-317	COMPANY SUN OIL COMPANY																								
STATION HOFKES	WELL H.S. RECORD # 4																								
TRUCK NO. 20-28	FIELD SOUTH EVINCE																								
COMPANY SUN OIL COMPANY WELL H.S. RECORD # 4 FIELD SOUTH EVINCE COUNTY LEB. STATE NEW MEXICO	COUNTRY STATE LEB., NEW MEXICO																								
	LOCATION 3500' EN & CL SEC. 22 Twp. 22 S. R. 35 E.																								
	LOG HEAD FROM 5' ABOVE H.M.F. ELEV. 3502																								
	DRUG HEAD FROM SAME ELEV. 3502																								
	PERMANENT DATUM D.M.F. ELEV. 3523																								
<table border="1"> <thead> <tr> <th colspan="3">CASING RECORD</th> <th colspan="3">PIPE HOLE RECORD</th> </tr> <tr> <th>SIZE</th> <th>WT.</th> <th>FROM</th> <th>TO</th> <th>BIT SIZE</th> <th>FROM</th> </tr> </thead> <tbody> <tr> <td>10 3/4</td> <td></td> <td>5 1/2 - 14</td> <td>355</td> <td>7 7/8</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>352</td> <td></td> <td></td> </tr> </tbody> </table>		CASING RECORD			PIPE HOLE RECORD			SIZE	WT.	FROM	TO	BIT SIZE	FROM	10 3/4		5 1/2 - 14	355	7 7/8					352		
CASING RECORD			PIPE HOLE RECORD																						
SIZE	WT.	FROM	TO	BIT SIZE	FROM																				
10 3/4		5 1/2 - 14	355	7 7/8																					
			352																						
TYPE OF LOG RUN NO. 1 DATE 2-25-57 TOTAL DEPTH - DRILLER 3502 TOTAL DEPTH - P.G.A.C. 3502 FLUID IN HOLE WATER FLUID LEVEL 260 SURFACE TEMPERATURE 74 INSTRUMENT O.D. AND NO. 2 5/8 - 211 INSTRUMENT TYPE TA - PH - 125 NEUTRON SOURCE TYPE MG - 600 CPS FOR CALIB STD. 119 - M 158																									

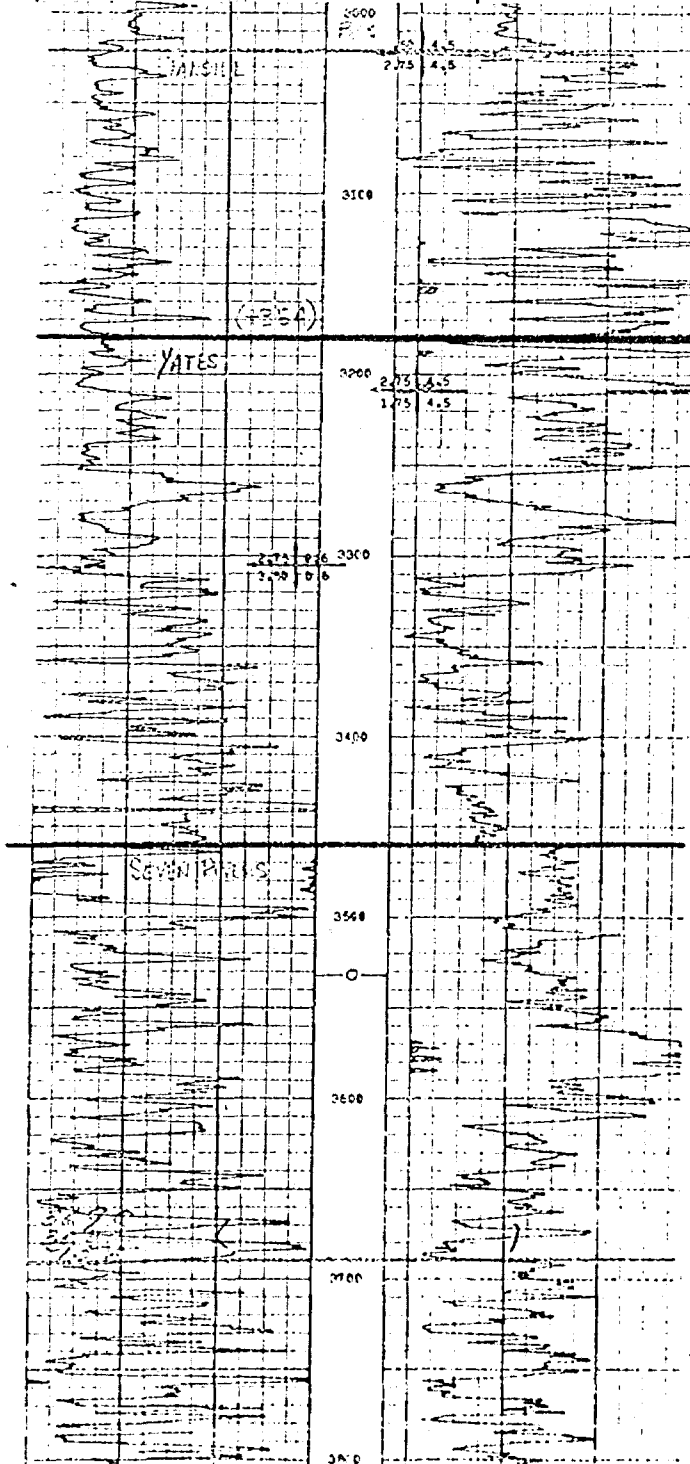


EXHIBIT 5-12

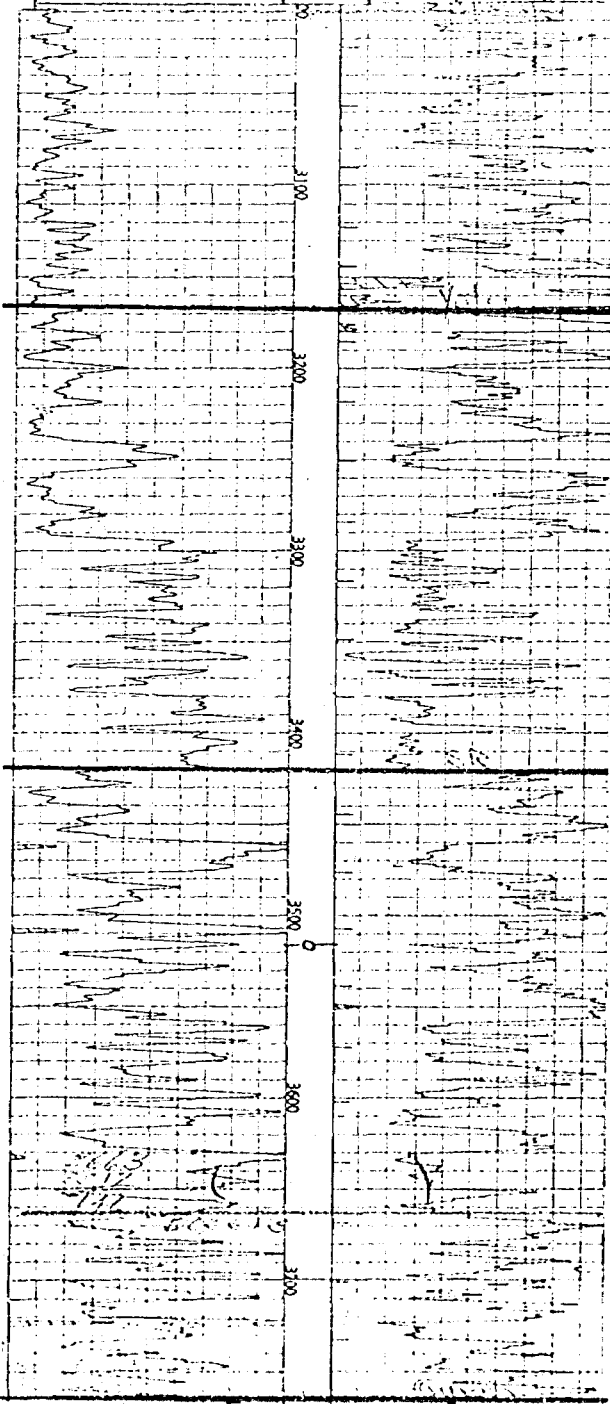


# RADIOACTIVITY LOG WELEX JET SERVICES, Inc.

LOGGED BY: WELEX SERVICES, INC.

FILE NO.

COMPANY	WELEX SERVICES, INC.	LOG NO.	100
WELL	W. C. T. E. L. S. A. T. I. O. N.	LOG NO.	100
FIELD	W. C. T. E. L. S. A. T. I. O. N.	LOG NO.	100
COUNTY	W. C. T. E. L. S. A. T. I. O. N.	LOG NO.	100
LOCATION	W. C. T. E. L. S. A. T. I. O. N.	LOG NO.	100
LOG MEAS. FROM	1" 1/2" 1" 1/2" 1" 1/2"	ELEV. 3519'	
DRILL MEAS. FROM	1" 1/2" 1" 1/2" 1" 1/2"	ELEV. 3505'	
FEET/INCH	1" 1/2" 1" 1/2" 1" 1/2"	ELEV. 3505'	
TIME OF LOG	1" 1/2" 1" 1/2" 1" 1/2"		
RUN NO.	1" 1/2" 1" 1/2" 1" 1/2"		
DATE	1" 1/2" 1" 1/2" 1" 1/2"		
JOB NO.	1" 1/2" 1" 1/2" 1" 1/2"		
TOTAL DEPTH (DRILLER)	1" 1/2" 1" 1/2" 1" 1/2"		
EFFECTIVE DEPTH (DRILLER)	1" 1/2" 1" 1/2" 1" 1/2"		
TOTAL DEPTH (ALCOG)	1" 1/2" 1" 1/2" 1" 1/2"		
TOP OF LOGGED INTERVAL	1" 1/2" 1" 1/2" 1" 1/2"		
EDITION OF LOGGED INTERVAL	1" 1/2" 1" 1/2" 1" 1/2"		
TYPE OF LOG IN HOLE	1" 1/2" 1" 1/2" 1" 1/2"		
FLUID LEVEL	1" 1/2" 1" 1/2" 1" 1/2"		
MAXIMUM RECORDED TEMPERATURE	1" 1/2" 1" 1/2" 1" 1/2"		
NEUTRON SOURCE STRENGTH & TYPE	1" 1/2" 1" 1/2" 1" 1/2"		
SOURCE SPACING - IN.	1" 1/2" 1" 1/2" 1" 1/2"		
LENGTH OF MEASURING DEVICE - IN.	1" 1/2" 1" 1/2" 1" 1/2"		
O.D. OF INSTRUMENT - IN.	1" 1/2" 1" 1/2" 1" 1/2"		
TIME CONSTANT - SECONDS	1" 1/2" 1" 1/2" 1" 1/2"		
LOGGING SPEED FT. PER MIN.	1" 1/2" 1" 1/2" 1" 1/2"		
STATISTICAL VARIATION - IN.	1" 1/2" 1" 1/2" 1" 1/2"		
SENSITIVITY REFERENCE	1" 1/2" 1" 1/2" 1" 1/2"		
RECORDED BY	1" 1/2" 1" 1/2" 1" 1/2"		
WITNESSED BY	1" 1/2" 1" 1/2" 1" 1/2"		



2400

R.O. 3624

Delta 2, Texas

REFERENCE N° A 5620 -B

## SIMULTANEOUS RADIATION LOG

LOCATIONS CONTINENTAL OIL COMPANY  
 REC. 22 MEYERS 8-22 # 11  
 MAP. 22S SOUTH ELKHORN  
 P.E. 3.E  
 13.0 FR  
 6.00 FEL  
 22 22S 36-E

LOG NO. 11572	308V.54" CRG. FLUE.	LOCATION 3522
LOG WORKING FROM	SAFE	LOCATION 3522

[illegible]

RECORDED BY  
INDEXED BY

ELKINS  
FEELEA

CASING RECORD				OPEN HOLE RECORD	
FLW	DATE	WELL NO.	IN-TRIPAL	DATE	WELL NO.
ONE	12/18	121	SURFACE TO	12/18	121
TWO	12/18	121	SURFACE	12/18	121
			357		
			3300		

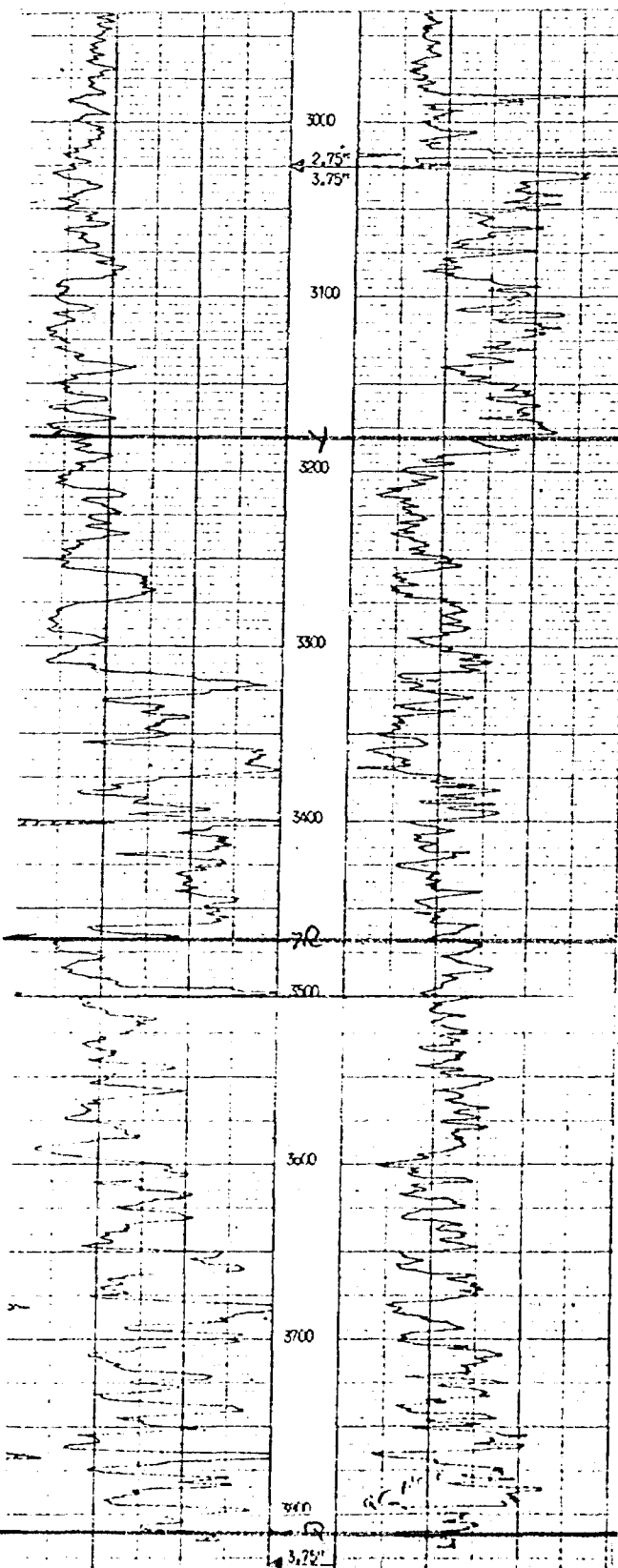


EXHIBIT 5-14

Reproduced By  
West Texas Electrical Log Service  
Dallas, Texas

REFERENCE No A-1036 -A

GEOL. SECTION  
OSWELL DN.  
NO. 22-3

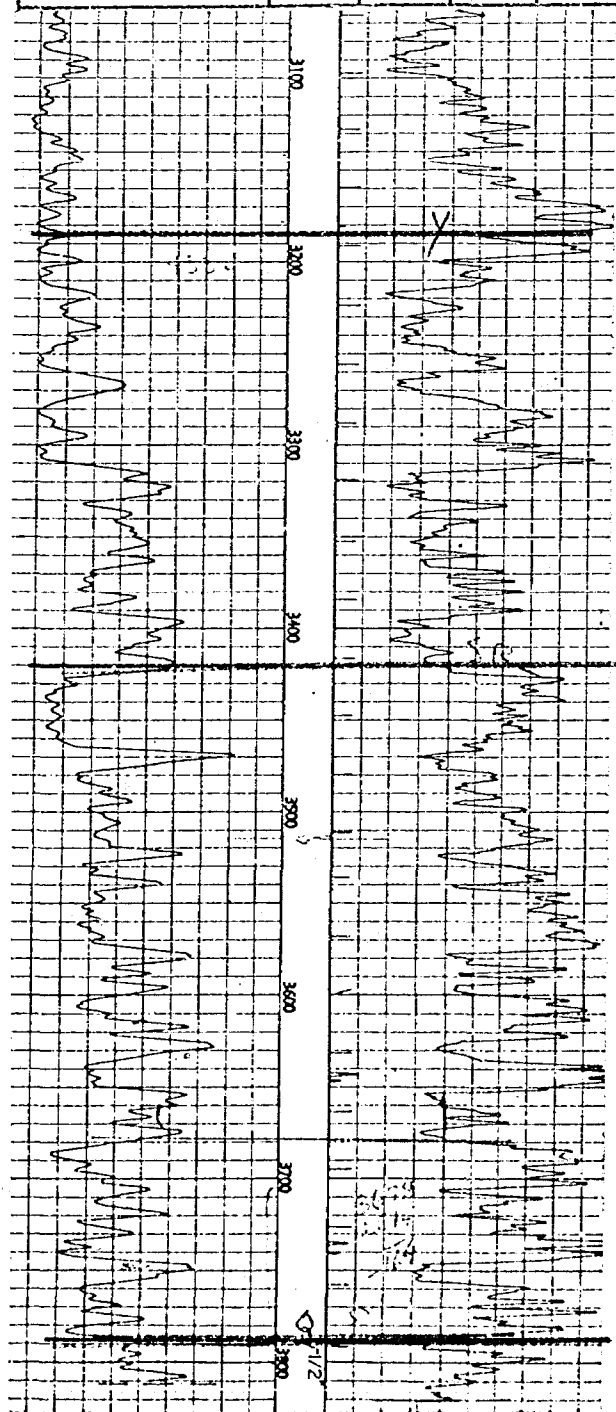


RADIOACTIVITY LOG  
WELEX SERVICES, Inc.

LICENSED BY: WEST TEXAS ELECTRICAL LOG SERVICE, INC.

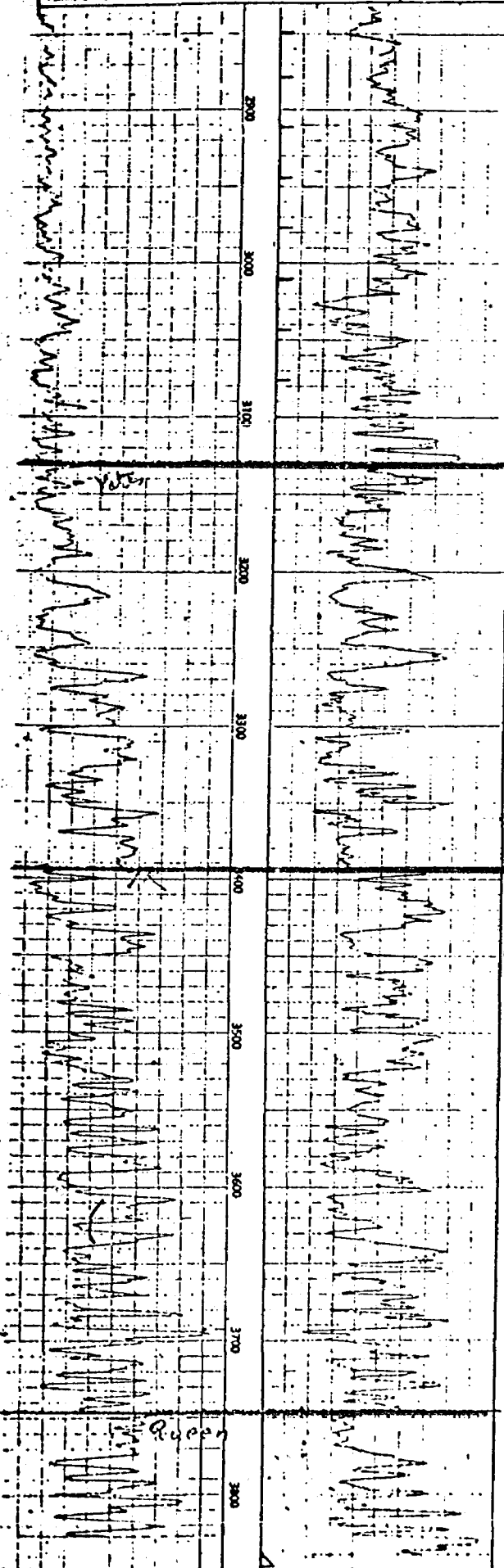
FILE NO.

Location of Well	COMPANY	CATINENTAL OIL COMPANY	WELL	NO. 22 NO. 5	FIELD	SOUTH ECKICE	COUNTY	LEA	STATE	N. MEX.	LOCATION	660' FSL & 660' FVL OF SSC. 22 T-22-3 R-35-2.
LOG MEAS. FROM	DIRTICK FLOOR	ELEV. 3514'	DIRTICK MEAS. FROM	DIRTICK FLOOR	ELEV. 3514'	PERM. DATUM	CASINO PLANK	ELEV. 3504'				
TYPE OF LOG	GAMMA RAY	NEUTRON										
RUN NO.	- 1 -	- 1 -										
DATE	7/13/55	7/13/55										
JOB NO.	375-473	375-683										
TOTAL DEPTH (DALLER)	3330	3330										
EFFECTIVE DEPTH (DALLER)	3323	3323										
TOTAL DEPTH (VIA LOG)	3323	3323										
TOP OF LOGGED INTERVAL	30	30										
BOTTOM OF LOGGED INTERVAL	3512	3321										
TYPE OF FLUID IN HOLE	WATER	WATER										
FLUID LEVEL	100	100										
MAXIMUM RECORDED TEMPERATURE		600 F										
NEUTRON SOURCE STRENGTH & TYPE		3.75										
SOURCE SPACING-IN		9.1										
LENGTH OF MEASURING DEVICE-IN	30	3.5/3										
O.D. OF INSTRUMENT-IN	3.5/3	3.1										
TIME CONSTANT-SECONDS	1.0	1.0										
LOGGING SPEED FT./MIN.	20	20										
STATISTICAL VARIATION-IN	0.6	0.6										
SENSITIVITY REFERENCE	274	275										
RECORDED BY	INTECH	INTECH										
WITNESSED BY	NO. 1000000											



# LANE RADIOACTIVITY LOG WELLS COMPANY REGION

Location of Well	COMPANY: CONTINENTAL OIL CO.		WELL: W-22 #5 FIELD: SOUTH ST. P. COUNTY: LEA STATE: N.M. LOCATION: 560 751, 1520 FEE, SEC 22 T-23-S, R-35-E	COUNTRY: LEA STATE: N.M.
	WELL: W-22 #5			
	FIELD: SOUTH ST. P.			
	COUNTY: LEA STATE: N.M.			
LOCATION: 560 751, 1520 FEE, SEC 22 T-23-S, R-35-E				
LOG MEAS. FROM	ROTARY TABLE	REV. 1511		
ORIG. MEAS. FROM	ROTARY TABLE	REV. 1511		
PERM. DATUM	OP. VIB. LEVEL	REV. 1479		



29-22-36

**THE WESTERN COMPANY**  
**CAMARON**  
*Simultaneous Radioactivity Log*

COMPANY: CONTINENTAL OIL CO.	LOCATION:
WELL: METERS A-25 & 6	
FIELD: S. EUNICE	
COUNTY: LEA STATE: TEX.	
LOCATION: SEC. 17N & 11E, SEC. 25	FILE NO:
1-22-S, R-34-E	LOG NO 59726
LOG MEAS FROM: 10' ABOVE CASING HEAD ELEV 3522	
DRIG MEAS FROM: 10' ABOVE CASING HEAD ELEV 3522	
PERM DATUM: TOP OF 5 1/2" CASING, ELEV. 3531	

TYPE OF LOG	S/R	N/A
RUN NO	1-NW	1-NW
DATE	2-25-57	2-22-57
TOTAL DEPTH (DRILL)	3815	3815
EFFECTIVE DEPTH (DRILL)	3811	3811
EFFECTIVE DEPTH (WESTERN)	3811	3811
TOP OF CASING INTERVAL	SURF	SURF
BOTTOM OF LOGGED INTERVAL	3758	3809.5
TYPE OF FLUID IN HOLE	OIL	OIL
FLUID LEVEL	FULL	FULL
SOURCE STRENGTH & TYPE	SCINT.	SCINT.
SOURCE SPACING	12.5	12.5
DETECTOR CLASS	SCINT.	SCINT.
DETECTOR TYPE	DG1	DG1
DETECTOR LENGTH	4"	4"
O.D. OF INSTRUMENT, IN	3 5/8	3 5/8
TIME CONSTANT, SEC	2.0	2.0
LOGGING SPEED, FT MIN	30	30
STATISTICAL VARIATION	RECORDED	RECORDED
SENSITIVITY REFERENCE	C-533	D-368
RECORDED BY	CARROLL & ROSS	
WITNESSED BY	MR. WILL WHEELER	

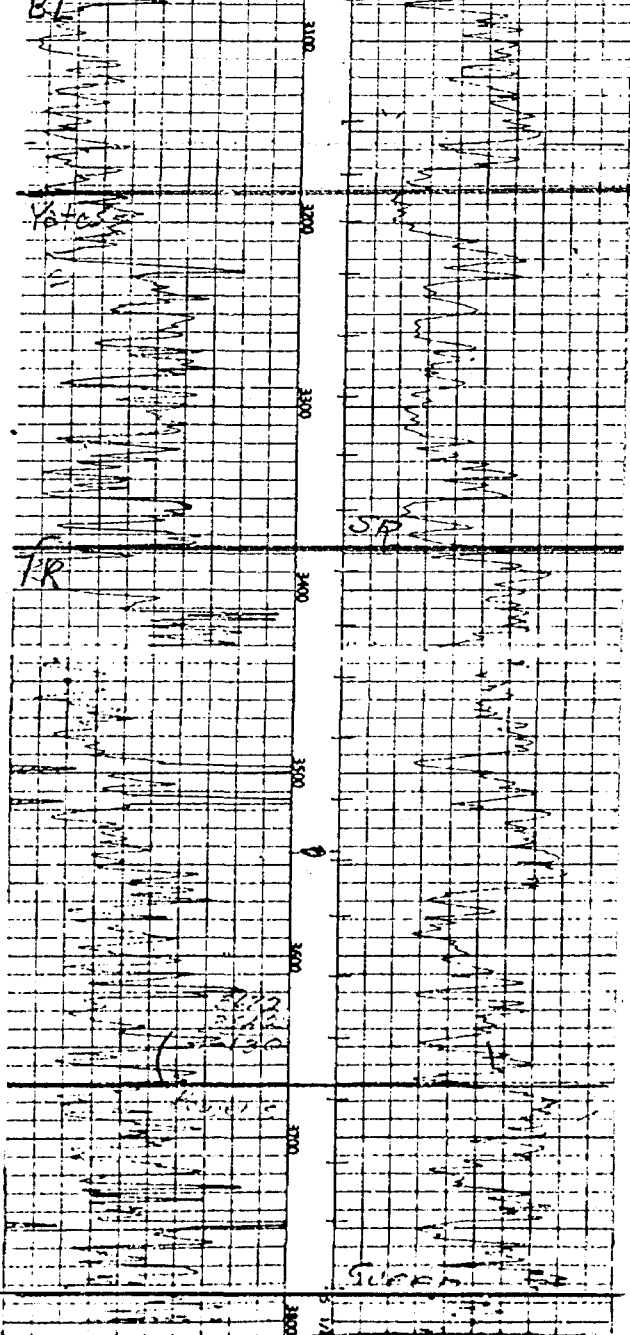


EXHIBIT 5-17



COMPANY: **CONSTRUCTION AND CREATION**  
 TYPE: **INTER-STATE**  
 COUNTY: **CONSTRUCTION**  
 LOCATION: **CONSTRUCTION**  
 ADDRESS: **CONSTRUCTION**



GEOL. SECTION  
ROSWELL DIV.  
S. W. P. ON 8-22-36

Prepared By  
West Texas Electrical Log Service  
Dallas 2, Texas

REFERENCE No A 5816 -E



RADIOACTIVITY LOG  
WELEX JET SERVICES, Inc.

FILE NO.

Location of Well	COMPANY	CONFIDENTIAL OIL COMPANY	WELL	WELL NO.	28 NO. 7
35314P	WELL	WELL NO. 7	COUNTY	LEA	STATE TEXAS
35241	FIELD	LEA	LOCATION	6601 R. 2 & 19601 P. 1 OF S.E. 28	T - 22 - N, R - 36 - E.
LOG MEAS. FROM	10' ADV 5 1/2" CSG HD FLG	ELEV.	3531.1		
DRIG. MEAS. FROM	10' ADV 5 1/2" CSG HD FLG	ELEV.	3531.1		
PERM. DATUM	5 1/2" CSG HEAD FLANGE	ELEV.	3521.1		
TYPE OF LOG	GEIGY RAY	II - GUN			
RUN NO.	1	1			
DATE	11/15/56	11/15/56			
JOB NO.	44-2012 &	625-690			
TOTAL DEPTH (DRILLER)	3500	3500			
EFFECTIVE DEPTH (DRILLER)	3799	3799			
TOTAL DEPTH (R. A. LOG)	3799	3799			
TOP OF LOGGED INTERVAL	50	50			
BOTTOM OF LOGGED INTERVAL	3797	3797			
TYPE OF FLUID IN HOLE	OIL	OIL			
FLUID LEVEL	FULL	FULL			
MAXIMUM RECORDED TEMPERATURE		600 M			
NEUTRON SOURCE STRENGTH & TYPE		13.75			
SOURCE SPACING-IN.		13.75			
DETECTOR CLASS	CHAMBER	CHAMBER			
DETECTOR TYPE	E 127	C 209			
LENGTH OF MEASURING DEVICE-IN.	3 1/8	3 1/8			
O.D. OF INSTRUMENT-IN.	3 5/8	3 5/8			
TIME CONSTANT-SECONDS	4.5	4.5			
LOGGING SPEED FT./MIN.	20-40	20-40			
STATISTICAL VARIATION-IN.	0.2	0.35			
SENSITIVITY REFERENCE	276	D 368			
RECORDED BY	LYLE	LYLE			
WITNESSED BY	FR. BILL WELER				

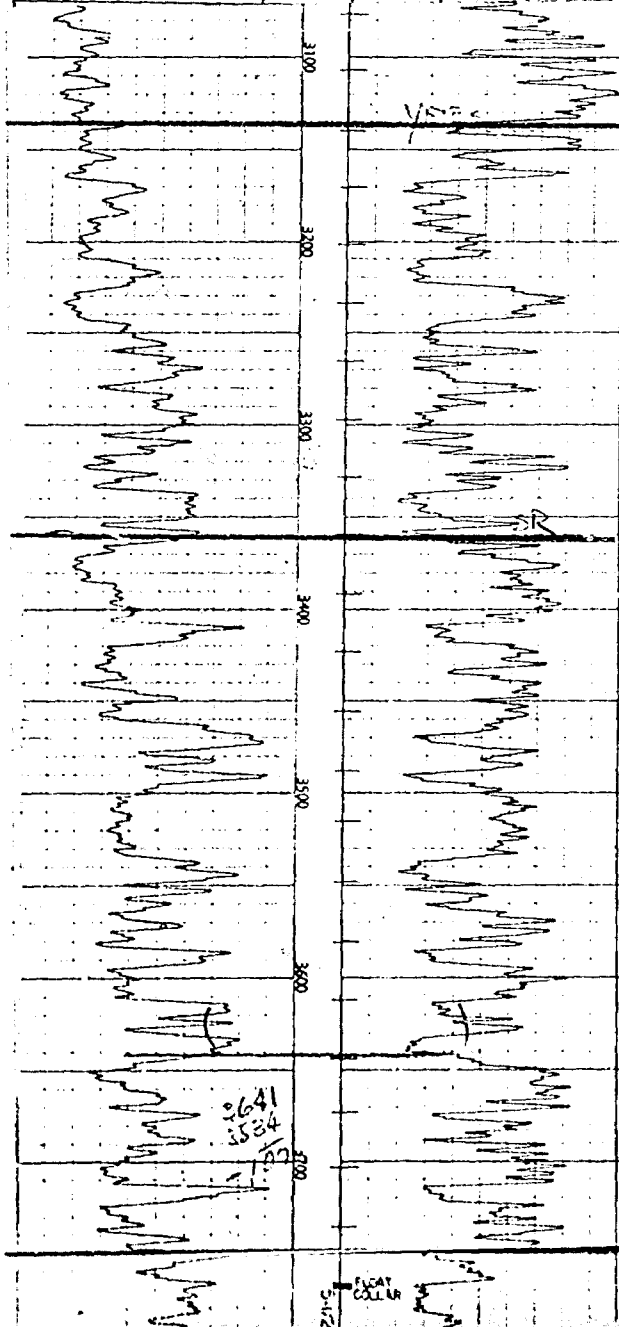


EXHIBIT 5-19

28-24-20  
GEOLOGICAL SECTION  
ROSWELL L...  
S. W. REGION

Reproduced By  
West Texas Electrical Log Service

Dallas, Texas

REFERENCE N° A 4412 -A

RADIOACTIVITY LOG	
WELEX JET SERVICES, Inc.	
LICENSED BY: WELL SURVEY, INC. FILE NO.	
Location of Well	COMPANY CONTINENTAL OIL COMPANY
WELL	METER 2 - 28 NO. 3
FIELD	SOUTH EUNICE POOL
COUNTY	LEA STATE N. MEX.
LOCATION	660' PTL & 660' TEL OF SEC. 28, T - 22 - S, R - 36 - E
LOG MEAS. FROM	1' ABOVE ROTARY TABLE ELEV. 3517'
DRILG. MEAS. FROM	KELLY DRIVE BUSHING ELEV. 3517'
PERM. DATUM	8 5/8" SURF. CSO. FLANGE ELEV. 3505'
TYPE OF LOG	GAMMA RAY NEUTRON
RUN NO.	- 1 -
DATE	11/7/55
JOB NO.	106-475
TOTAL DEPTH (DRILLER)	3815
EFFECTIVE DEPTH (DRILLER)	3811
TOTAL DEPTH (R/A LOG)	3815
TOP OF LOGGED INTERVAL	600
BOTTOM OF LOGGED INTERVAL	3813
TYPE OF FLUID IN HOLE	OIL
FLUID LEVEL	
MAXIMUM RECORDED TEMPERATURE	600 W
NEUTRON SOURCE STRENGTH & TYPE	3.75
SOURCE SPACING-IN.	9.1
LENGTH OF MEASURING DEVICE-IN.	3 5/8
O.D. OF INSTRUMENT-IN.	1 5/8
TIME CONSTANT-SECONDS	5.3
LOGGING SPEED FT./MIN.	10
STATISTICAL VARIATION-IN.	20
SENSITIVITY REFERENCE	0.3
RECORDED BY	276
WITNESSED BY	275
	BILES
	MR. COOK

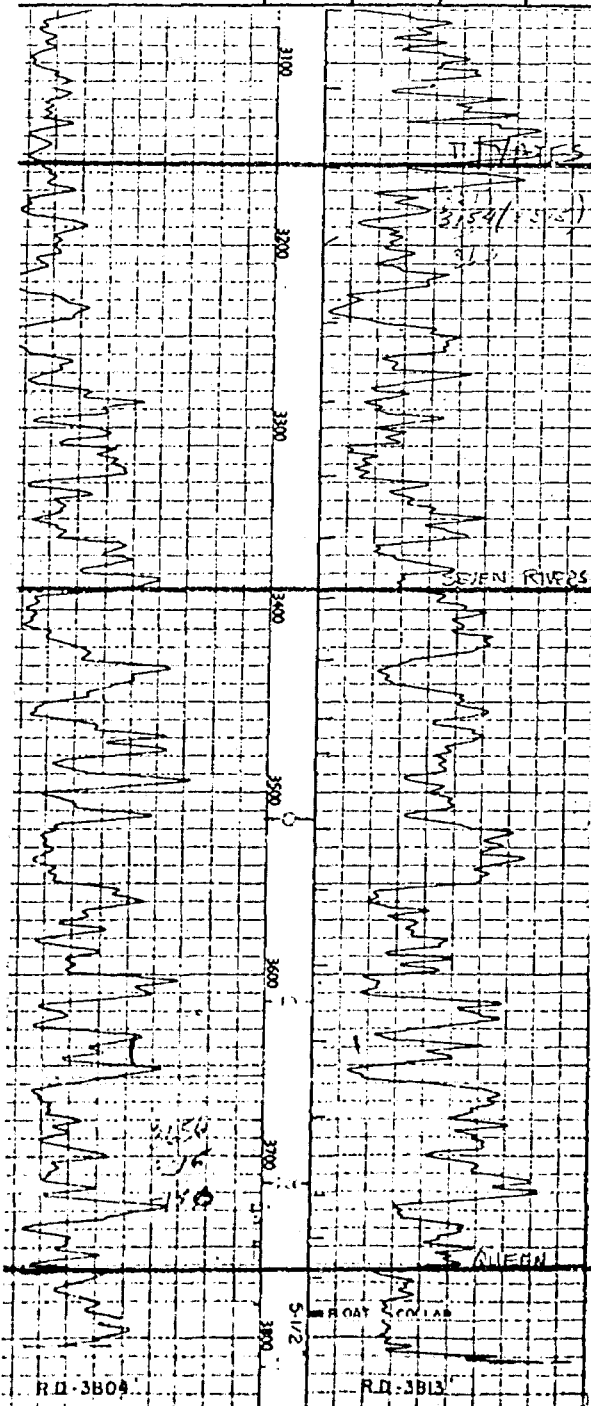


EXHIBIT 5-20

GEOL SECTION  
ROSWELL DIV.  
S. W. REGION

28-22-36

PERFORMING OILS BYLES CORPORATION

Simultaneous

# Radiation Log

LOG NO.	16313	COMPANY	CONTINENTAL OIL COMPANY						
STATION	H0666	WELL	MEYERS B - 28 F 18						
TRUCK NO.	CR-24	FIELD	SOUTH EUNICE POOL						
		COUNTY	LEA, NEW MEXICO						
		STATE	NEW MEXICO						
		LOCATION	1940' T.M. 658' T.M. SEC. 28						
			TWP. 22 S. RGE. 26 E.						
		LOG MEAS FROM	3' ABOVE H.T. ELEV. N.A.						
		DRILL MEAS FROM	SAME ELEV. N.A.						
		PERMANENT DATUM	8 1/2" C.S.F. ELEV. N.A.						
COMPANY CONTINENTAL OIL COMPANY WELL MEYERS B - 28 F 18 FIELD SOUTH EUNICE POOL COUNTY LEA STATE NEW MEXICO		CASING RECORD				HOLE HOLE RECORD			
		SIZE	WT.	FROM	TO	SIZE	WT.	FROM	TO
		8 5/8 - 24	SURF		351	12 1/4			
		5 1/2 - 14	SURF		3819	7 7/8			
TYPE OF LOG RUN NO. DATE TOTAL DEPTH - DRILLER TOTAL DEPTH - P.G.A.C. FLUID IN HOLE FLUID LEVEL MAXIMUM TEMPERATURE INSTRUMENT CO. AND NO. INSTRUMENT TYPE NEUTRON SOURCE TYPE CPS FOR CALIB STD. - CR H		GAMMA RAY - NEUTRON ONE 2-28-57 3816 3804 OIL FULL 3 5/8 - 211 TA - PH - 325 RB - BCE 148 288							
RECORDED BY WITNESSED BY		J. D. DRAVER R. C. LARSEN							

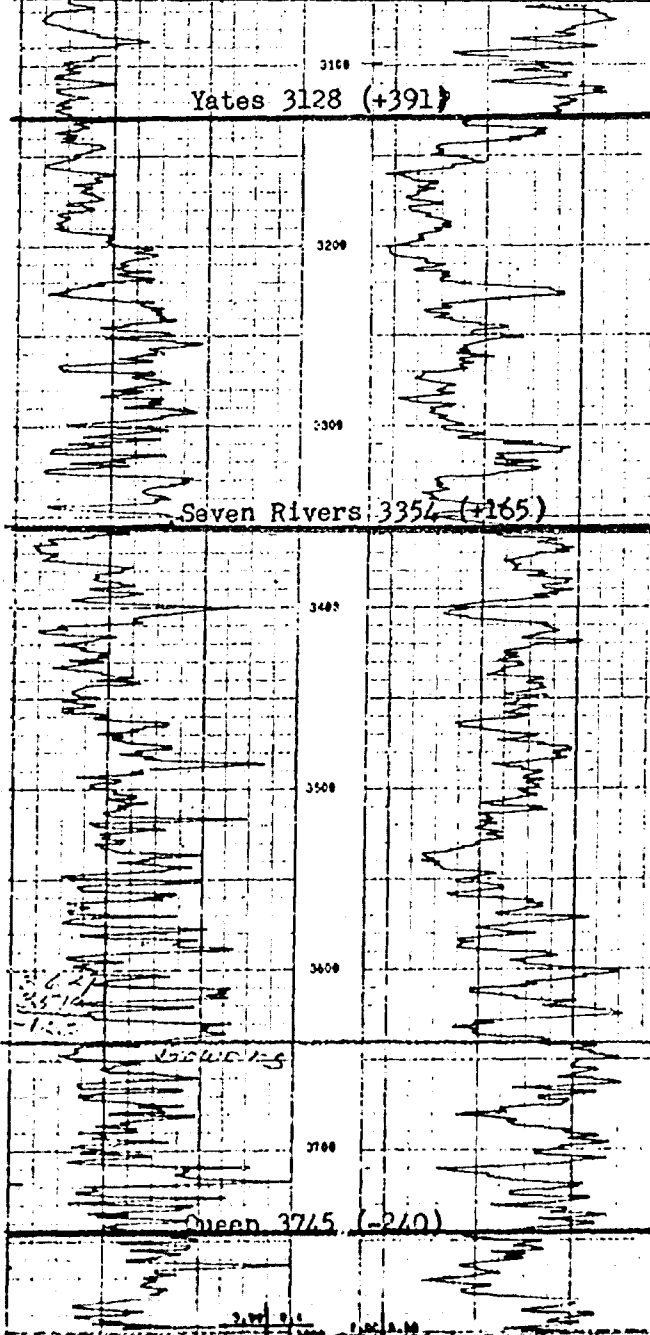


EXHIBIT 5-21

28-22-36

Reproduced By  
West Texas Electrical Log Service  
Dallas 2, Texas

COOL SECRET  
ROSWELL DIV.  
S. W. RECORD  
REFERENCE N° A 5421 -C

<b>McCULLOUGH</b> <small>TOOL COMPANY</small> <b>RADIATION LOG</b>																																																													
<b>Location of Well</b> 19601 PM #, 4 E. LINDS S&S 28-225-35E  ELEV. 2. L. 3503  <b>3510 DF</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2"><b>COMPANY</b> CONTINENTAL OIL COMPANY</td> </tr> <tr> <td><b>WELL</b> METER B-28 #6</td> <td><b>WELL</b> 3503 B-28 #6</td> </tr> <tr> <td><b>FIELD</b> SO. FRONT CO.</td> <td><b>FIELD</b> SO. FRONT CO.</td> </tr> <tr> <td><b>COUNTY</b> LJA</td> <td><b>COUNTY</b> LJA</td> </tr> <tr> <td><b>STATE</b> NEW MEXICO</td> <td><b>STATE</b> NEW MEXICO</td> </tr> <tr> <td colspan="2"><b>LOCATION</b></td> </tr> </table>	<b>COMPANY</b> CONTINENTAL OIL COMPANY		<b>WELL</b> METER B-28 #6	<b>WELL</b> 3503 B-28 #6	<b>FIELD</b> SO. FRONT CO.	<b>FIELD</b> SO. FRONT CO.	<b>COUNTY</b> LJA	<b>COUNTY</b> LJA	<b>STATE</b> NEW MEXICO	<b>STATE</b> NEW MEXICO	<b>LOCATION</b>																																																	
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EXHIBIT 5-22

GEOLOGICAL SECTION  
ROSWELL DIV.  
S. W. REGION

28-22-36

**THE WESTERN COMPANY**  
**GAMMATRON**  
*Simultaneous Radioactivity Log*

LOCATION: **2110' FSL 350' FSL SEC.**  
WELL: **TEXAS PACIFIC**  
FIELD: **SOUTH CUNICE**  
COUNTY: **LEA** STATE: **N. MEX.**  
LOCATION: **2110' FSL 350' FSL SEC.**  
FILE NO.: **20, 1-22-5, R-36-E**  
LOG NO: **12-5**

LOG MEAS FROM: **1' ABOVE R.T.** ELEV: **3501**  
ORIG MEAS FROM: **ELEV**  
PEER DATUM: **GROUND LEVEL** ELEV: **3492-5**

RUN NO.	ONE	ONE
TYPE OF LOG	CAMPA	NEUTRON
DATE	7-1-56	7-1-56
TOTAL DEPTH OPERATOR	3802	3802
EFFECTIVE DEPTH OPERATOR	3796	3796
EFFECTIVE DEPTH (WESTERN)	3796	3796
TOP OF LOGGED INTERVAL	SURF	SURF
BOTTOM OF LOGGED INTERVAL	3786	3795
TYPE OF FLUID IN HOLE	MUD	MUD
FLUID LEVEL	60	60
NEUTRON SOURCE TYPE		600H
SOURCE SPACING IN	3.75	3.75
LENGTH OF DETECTOR IN	5.0	5.0
OD OF INSTRUMENT IN	3 5/8	3 5/8
TIME CONSTANT SEC	3.0	2.5
LOGGING SPEED FT/MIN	10-35	10-35
STATISTICAL VARIATION IN		
SENSITIVITY REFERENCE	274	275
RECORDED BY	MC KENZIE	
WITNESSED BY	J.A. LEWIS, WALSCH & FR. J. LONNY FRENCH	

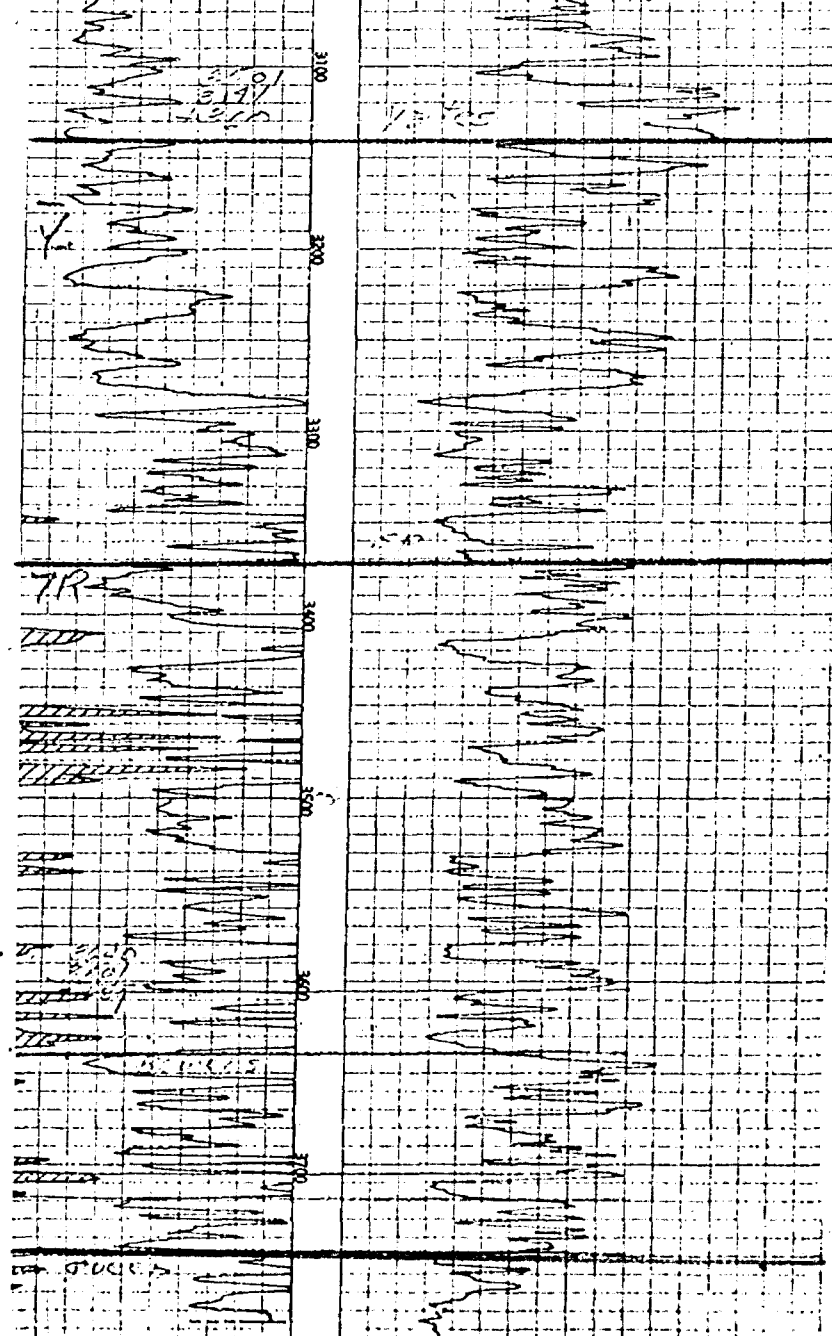


EXHIBIT 5-24

AT 3795  
T.D. 3796  
R. OLSEN PERSONAL  
CHRISTMAS

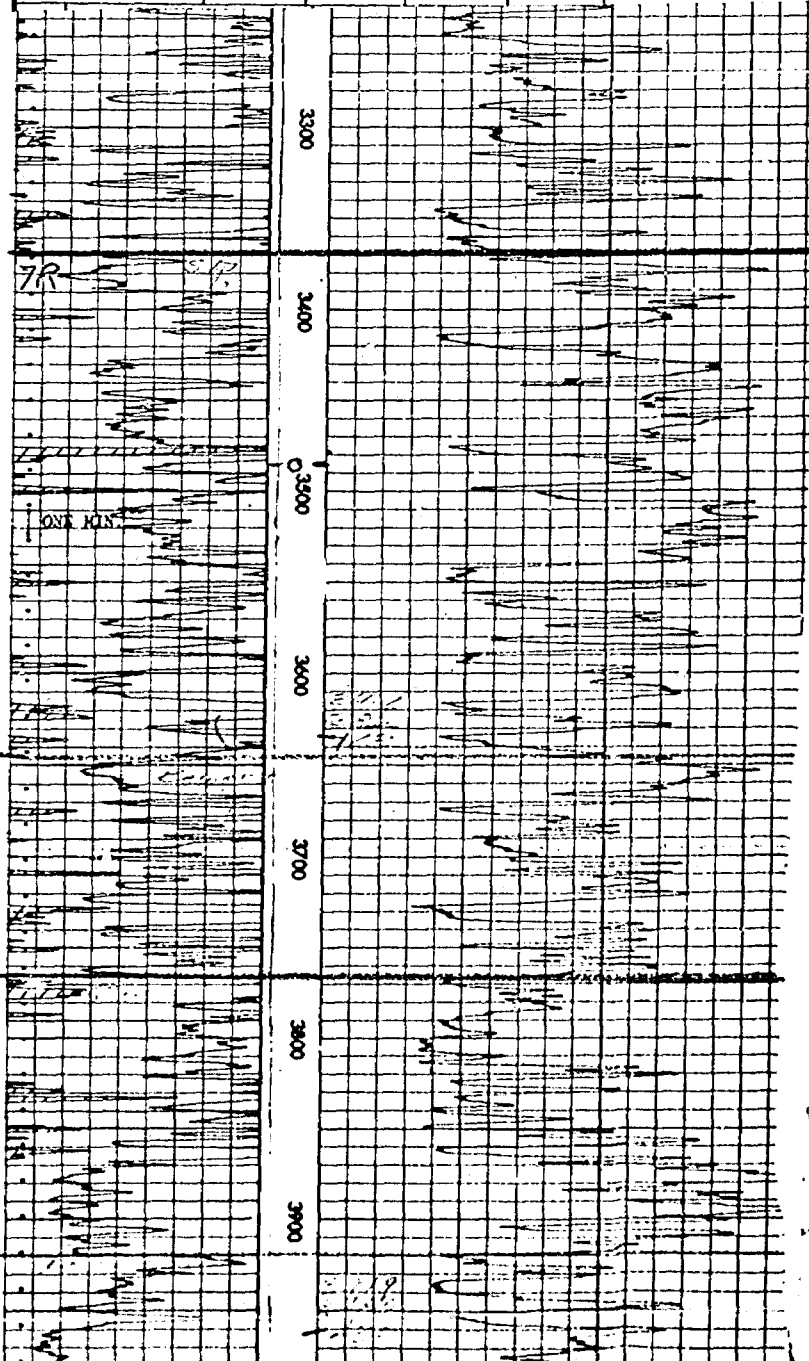


GEOL. SECTION  
ROSWELL DIV.  
S. W. REGION

33-22-36

<b>WELEX</b>		L.D.C.	
COMPANY ALBERT GACKLE, OPERATOR			
WELL ESMOND #4			
FIELD SOUTH EUNICE			
COUNTY LEA		STATE NEW MEXICO	
Location		Other Logs	
1980' FNL		GUARD	
1980' FEL		CALIPER	
Sec. 33		Twp. 22-S Rge. 36-E	
Permanent Datum		GROUND LEVEL Elev. 3492'	
Log Measured From		11' ABOVE GROUND LEVEL	
Drilling Measured From		11' ABOVE GROUND LEVEL	
Type Log	62R	N.G.	
Run No.	ONE	ONE	
Date	4-14-58	9-14-58	
Total Depth Driller	4005'	4005'	
Present Depth Driller	4005'	4005'	
Total Depth Wires	3991'	4001'	
Survey Begins	3991'	4001'	
Survey Ends	0'	0'	
Mud Data	STARCH-OIL	GEL	
Type Fluid in Hole	MUD		
Salinity PPM O			
Weight L./gal.		27'	
Fluid Level		105' P	
Max. Hole Temp.			
Recorded By	AYRES		
Witnessed By	K. SOUTHERLAND		

34.82 DF  
34.75 g.



33-22-36

**WELEX**
**WELL LOG**  
**WELL**

CONTINENTAL OIL COMPANY WELL NO. 33 # 9 FIELD SOUTH KUNICK COUNTY LEA STATE NEW MEXICO	COMPANY	CONTINENTAL OIL COMPANY	
	WELL	MEYER B-33 # 9	
	FIELD	SOUTH KUNICK	
	COUNTY	LEA	STATE NEW MEXICO
	Location	1930 FSL 660' FSL SEC. 33 TYP. 22 RGE. 35	

Permanent Datum	12' ABOVE GEOTID LEV. 3486	Flare Point	3486
Log Measured From	KELLY BUSHING	CR	3474
Drilling Measured From	KELLY BUSHING	CL	3474

Type Log	GAOHA	N - N
Run No.	11-6-59	11-6-59
Date	3814	3814
Total Depth Driller	3814	3814
Previous Depth Driller	3808	3808
Total Depth Water	3795	3807
Survey Begins	10	10
Survey Ends		
Mud Data		

Type Fluid in Hole	WATER	WATER
Salinity PPM Cl		
Weight lb/gal	55	55
Fluid Level		
Max. Hole Temp		
Recorded By	KEN SMITH	
Witnessed By	KELLY BUSHING	

BORE HOLE RECORD				CASING RECORD			
Run	By	From	To	Size	Wgt	From	To
12-1/4"		0	369	8-5/8"		0	369
7-7/8"		369	3814	5-1/2"		0	3814

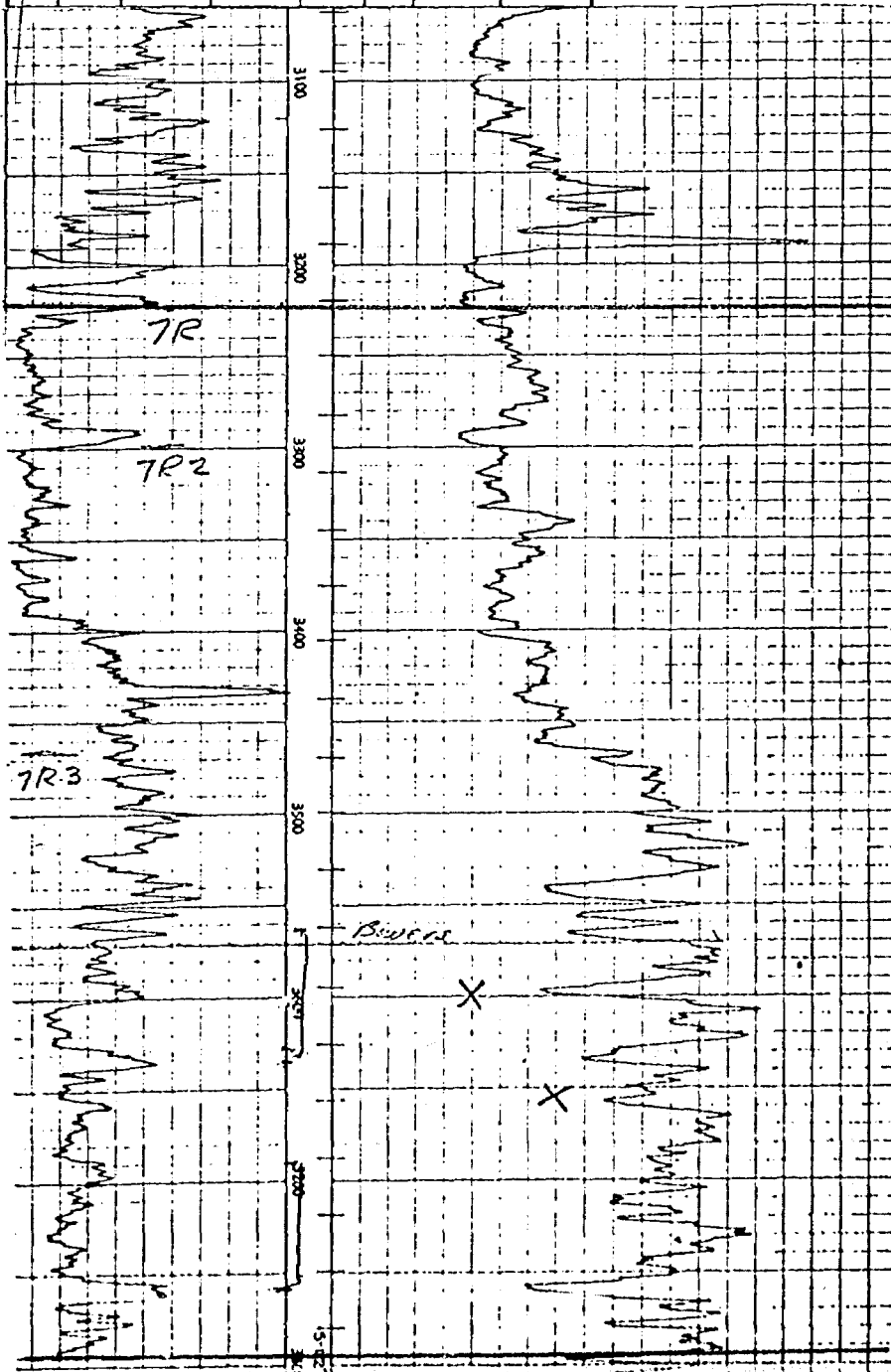


EXHIBIT 5-28

SECTION  
KOSWELL DIV.  
S. W. REGION

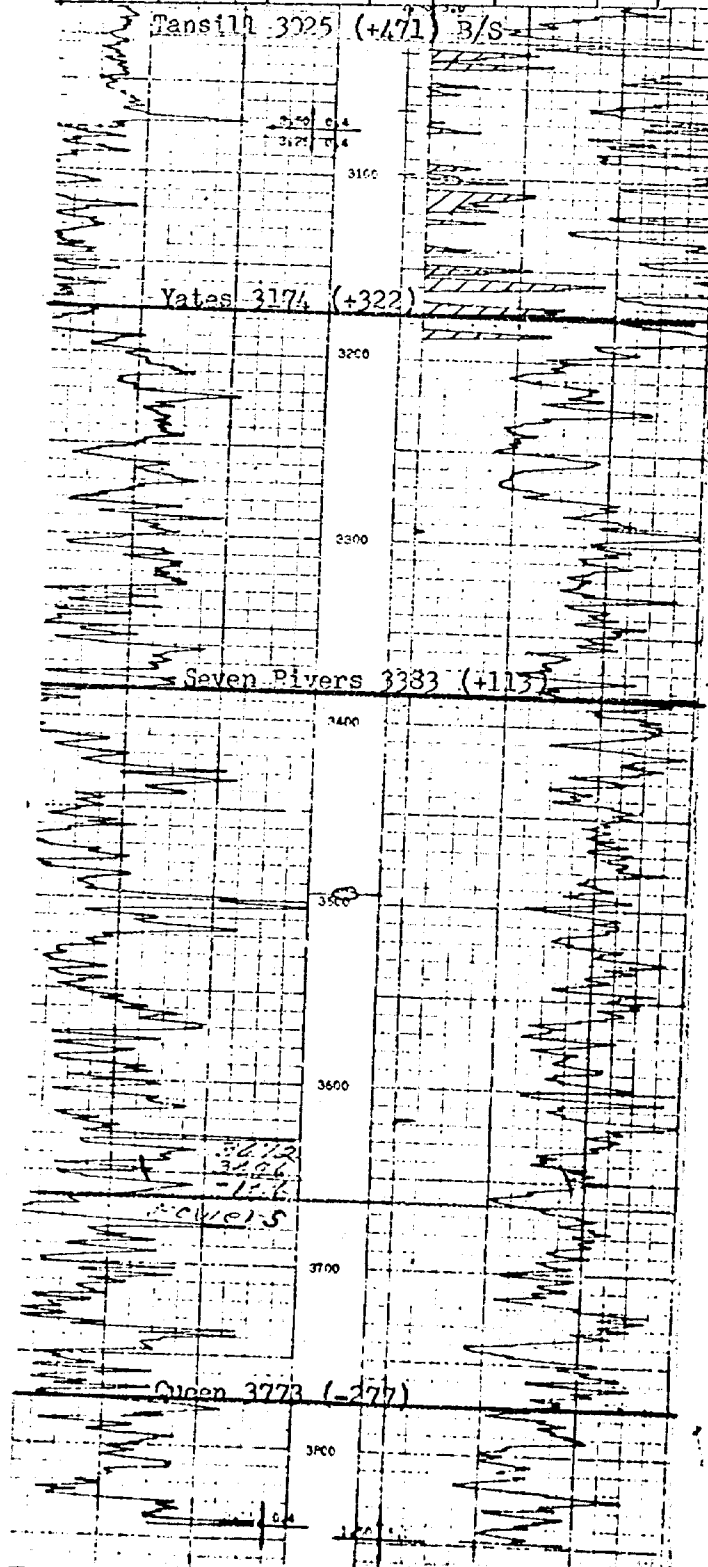
33-22-36

PERFORMANCE OILS CORPORATION

Simultaneous


# Radiation Log

LOG NO.	3536P	COMPANY	CONTINENTAL OIL COMPANY
STATION	MOSES	WELL	MEYER B-23 & 3
TRUCK NO.	GR-22	FIELD	SOUTH EUNICE
CONTINENTAL OIL COMPANY WELL FIELD COUNTY STATE	MEYER B-23 & 3 SOUTH EUNICE LEA, NEW MEXICO	COUNTY	LEA, NEW MEXICO
		STATE	LEA, NEW MEXICO
		LOCATION	1904 FSL 660' FEL SEC. 33
		LOG HEAD FROM	1' ABOVE M.T. ELEV. 3495
		DALG HEAD FROM	SAME ELEV. 3495
		PERMANENT DATUM	8 5/8" B.M.F. ELEV. 3485
		CASING RECORD	BORE HOLE RECORD
		SIZE - IN. FROM TO	BIT SIZE - FROM TO
		8 5/8 - 24 358	
		5 1/2 - 14 2850	7 3/4



GEO. SECTION  
ROSWELL DIV.  
S. W. REGION

33-22-36

SCHILLINGER WELL SURVEYING CORPORATION			
		General Well Information	
COUNTY FIELD LOCATION WELL COMPANY	COMPANY	CONTINENTAL	Other Surveys
	OIL COMPANY		
	WELL	MYER 2-22-36	
	FIELD	S. LUNIG	
	LOCATION	SEG. T-225	
			Location of Well 660' FSL 980' FWL
			Elevation: 4772 K.B. 4772 or G.L. 4772
	COUNTY	LLA	FILING No.
	STATE	NEW MEXICO	
Log Depths Measured from 10' Fr. above 8 5/8 Gdf			
RUN NO. 2-22-36			
Date 2-22-36			
First Reading 3771			
Last Reading 3772			
Footage Measured 3771			
Max. Depth Reached 3772			
Bottom Driller 3772			
Maximum Temp. F. WATER			
Fluid Level			
Casing Size 5 1/2 in.			
Casing Weight 14 lb. Sur. to T.B.			
Casing Size in.			
Casing Weight lb.			
Bit Size 7 7/8 in.			
No. Counters Used 2			
Type Equipment GMAH-5			
Type Panel UNP-C-265			
Opr. Rig Time 2 HOURS			
Truck No. 1578-ANDREWS			
Observer MCCULLUM			
Witness			

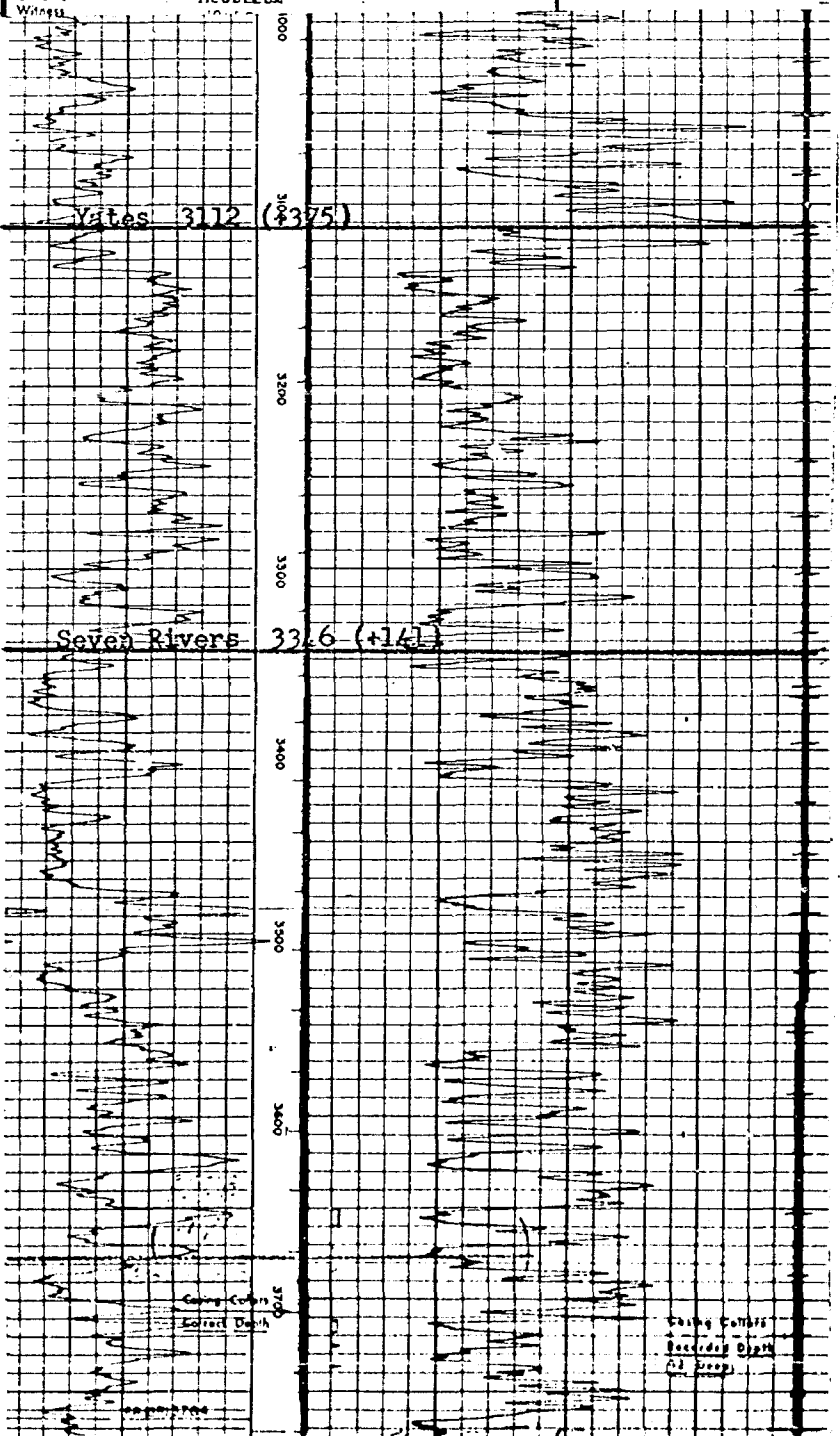
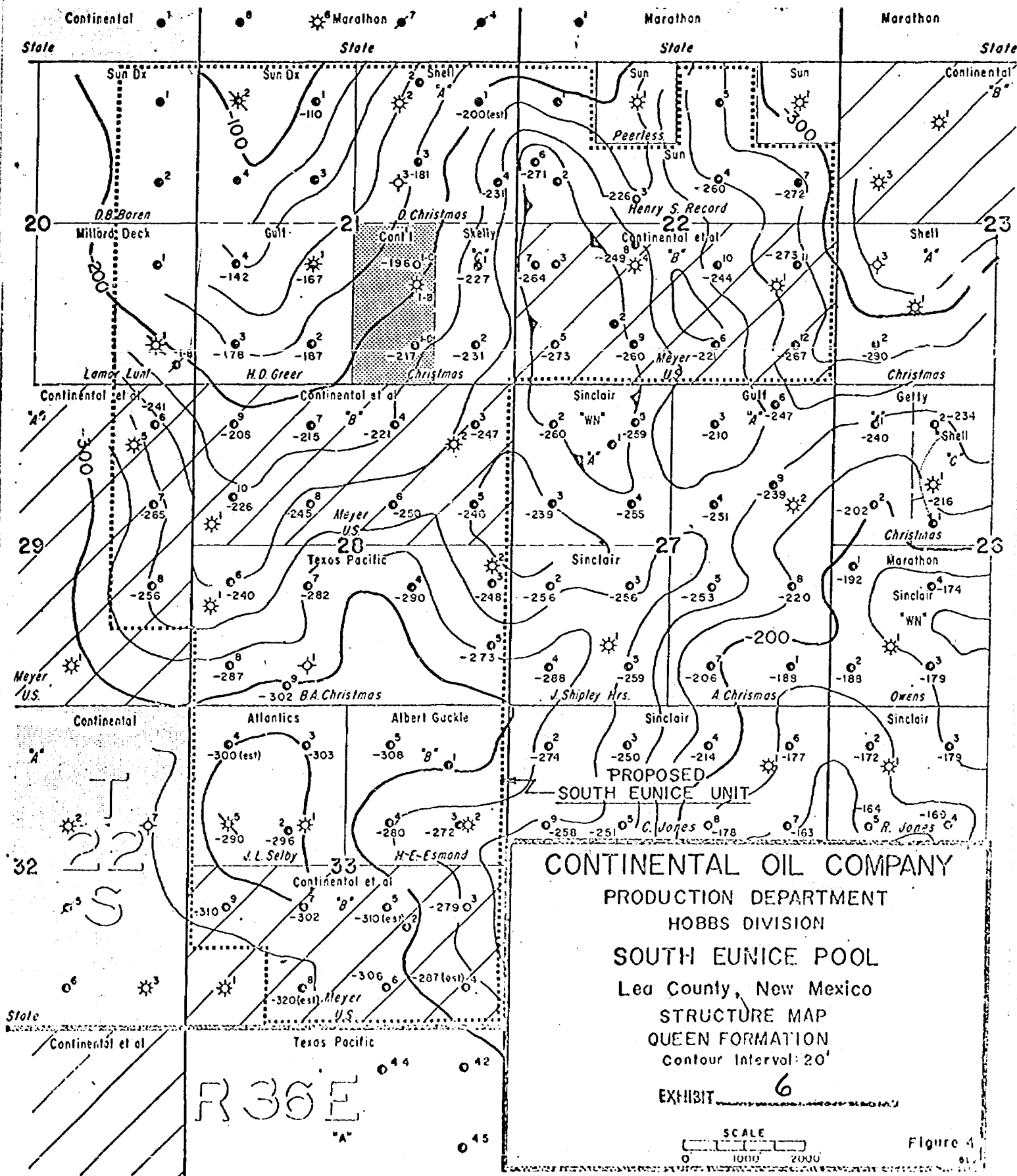
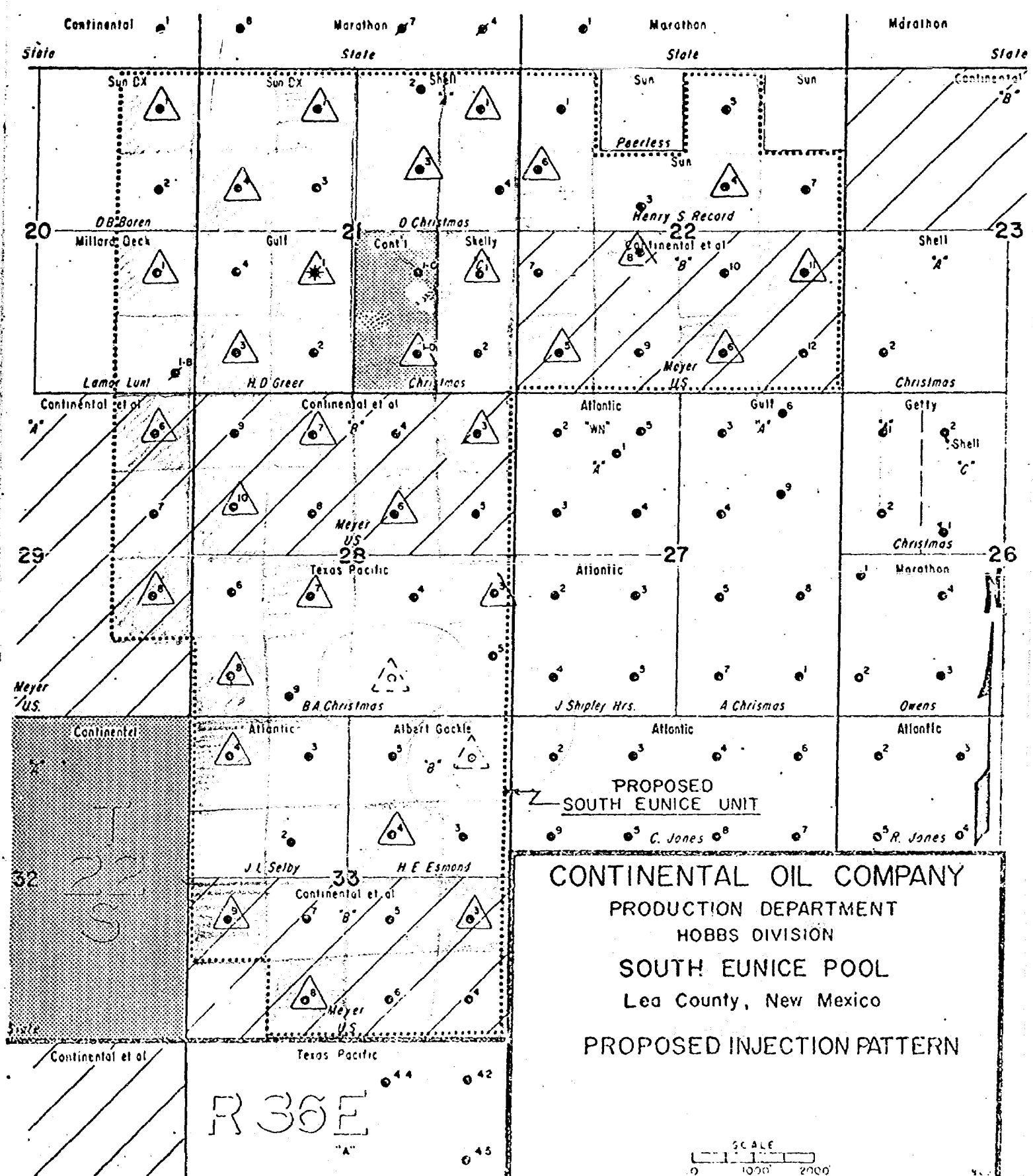


EXHIBIT 5-30





△ WATER INJECTION WELL TO BE DRILLED  
 △ PROPOSED WATER INJECTION WELL

# SUMMARY DATA SHEET

## SOUTH EUNICE UNIT

### GENERAL

1. Area, Acres	2720
2. Number of Producing Oil Wells	46
3. Number of Shut In Wells	17
4. Cumulating Oil Production to 9-1-70, bbls	3,135,218
5. Average Daily Oil Production Per Well, August 1970, bbls	1.5
6. Average Daily Water Production Per Well, August 1970, bbls	1.6
7. Average Gas-Oil Ratio, August 1970	23,024

### GEOLOGICAL DATA

1. Producing Formation	Queen-Seven Rivers
2. Average Depth, Feet	3725
3. Type Structure	Flank of Anticline
4. Primary Pore Volume, Acre-Feet	40,800
5. Secondary Pore Volume, Acre-Feet	35,625

### RESERVOIR PROPERTIES

1. Estimated Original Reservoir Pressure, Est., psi	1440
2. Estimated Reservoir Pressure At Waterflood, psi	300
3. Average Porosity	18.2
4. Reservoir Saturation	
a) Initial Water, %	35
b) Initial Reservoir Oil, %	65
c) Reservoir Oil at Waterflood, %	49.5
d) Residual Reservoir Oil After Sweep, %	33
5. Reservoir Oil Properties	
a) Initial Formation Volume Factor	1.16
b) Waterflood Formation Volume Factor	1.07
c) API Gravity	36°
6. Estimated Original Oil in Place	
a) Stock Tank Barrels	30,500,000
b) Stock Tank Barrels Per Acre-Feet	748

### RESERVE ESTIMATES

1. Primary Recovery, Percent of Stock Tank Oil in Place	10.4
2. Estimated Waterflood Recovery	
a) Barrels of Stock Tank Oil	3,310,000
b) Barrels of Stock Tank Oil Per Acre-Feet	93
c) Percent of Initial Stock Tank Oil in Place	10.8



TELEPHONE: HOBBS 393-7751  
AREA CODE - 505

## UNITED CHEMICAL CORPORATION

OF NEW MEXICO

601 NORTH LEECH

P. O. BOX 1499

HOBBS, NEW MEXICO 88240

Company.....Continental Oil Company

Field.....Jalmat - YATES SEVEN RIVERS

Lease.....Lynn A #4.....Sampling Date.....10-21-70

Type of Sample.....

### WATER ANALYSIS

IONIC FORM	me/l *	mg/l *
Calcium (Ca++)	32.93	660
Magnesium (Mg++)	52.88	66
Sodium (Na+) (Calculated)	163.47	3,758
Carbonate (HCO <sub>3</sub> -)	22.40	1366
Carbonate (CO <sub>3</sub> -)	NOT	FOUND
Hydroxide (OH-)	NOT	FOUND
Sulphate (SO <sub>4</sub> -)	8.33	400
Chloride (Cl-)	218.55	7750
7.5ph c 68 °F		
Dissolved Solids on Evap. at 103° - 105° C		
Hardness as CaCO <sub>3</sub>	85.81	4,291
Carbonate Hardness as CaCO <sub>3</sub> (temporary)	22.40	1,120
Non-Carbonate Hardness as CaCO <sub>3</sub> (permanent)	63.41	3,171
Alkalinity as CaCO <sub>3</sub>	22.40	1,120
Specific Gravity c 68° F	1.010	

\* mg/l: milligrams per liter

\* me/l: milliequivalents per liter

Calcium carbonate scaling index positive at 86°

Calcium sulfate scaling index negative

EXHIBIT 9

Michas Water Works

Case 4459

Heard. 11-18-70

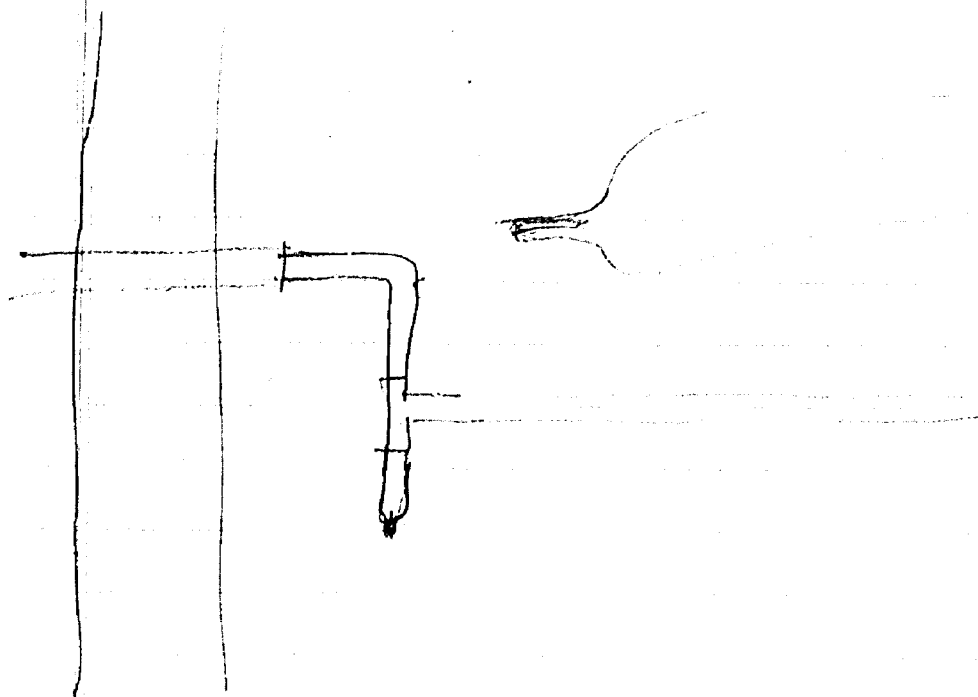
Rec. 11-20-70

Grant Cont. permission to convert  
30 wells to injection for their  
So. Famine Waterflood.

Use attached Ex. #4 for well  
list of injectors.

Rule 70

*John B. [Signature]*







# CONTINENTAL OIL COMPANY

P. O. Box 460

HOBBS, NEW MEXICO 88240

PRODUCTION DEPARTMENT  
HOBBS DIVISION

L. P. THOMPSON  
Division Manager

G. C. JAMIESON  
Assistant Division Manager

October 21, 1970

1001 NORTH TURNER  
TELEPHONE 393-4141

*Case 4959*

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

Attention Mr. A. L. Porter, Jr.,  
Secretary-Director

Gentlemen:

Subject: Application for Hearing, South Eunice Unit Agreement  
and Waterflood Project

Forwarded herewith in triplicate is our application for approval of South Eunice Unit Agreement and a Waterflood Project to be conducted in the South Eunice Pool. We are enclosing only one copy of the unit agreement in order to save the bulk in mailing. We should appreciate your placing this matter for hearing on the earliest examiner docket.

Yours very truly,

LPT-RW  
CC: RLA, JJB, JWK,  
Working Interest Owners  
Enc

DOCKET MAILED

Date 11-5-70

BEFORE THE OIL CONSERVATION COMMISSION  
OF THE  
STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF  
CONTINENTAL OIL COMPANY FOR APPROVAL  
OF THE SOUTH EUNICE UNIT AGREEMENT  
EMBRACING 2720 ACRES, MORE OR LESS,  
LOCATED IN SECTIONS 20, 21, 22, 28,  
29 and 33, TOWNSHIP 22 SOUTH,  
RANGE 36 EAST, NMPH, LEA COUNTY,  
NEW MEXICO, AND FOR PERMISSION TO  
INSTALL AND OPERATE A WATERFLOOD  
IN THE SOUTH EUNICE POOL WITHIN  
THE BOUNDARIES OF SAID UNIT AREA

*Case 4459*

A P P L I C A T I O N

Comes now Applicant, Continental Oil Company, and  
respectfully requests approval of the South Eunice Unit Agree-  
ment embracing 2720.00 acres, more or less, described as:

E/2 E/2 Section 20,  
All of Section 21,  
S/2, S/2 N/2, NW/4 NW/4, and NW/4 Section 22  
All of Section 28,  
E/2 NE/4 and NE/4 SE/4 Section 29,  
N/2, SE/4, E/2 SW/4 and NW/4 Section 33,  
Township 22, South, Range 36 East,  
Lea County, New Mexico

and for permission to install and operate a waterflood in the  
South Eunice Pool within the boundaries of said unit, and in  
support thereof Applicant would show:

1. That the South Eunice Unit Agreement is  
attached hereto and marked Exhibit 1.
2. That designation of Unit Area and preliminary  
approval of the Unit Agreement by the U. S.  
Geological Survey was given February 25, 1970.
3. That the attached lease plat marked Exhibit 2  
shows the South Eunice Unit and surrounding area  
at least two miles radius from said Unit boundary.
4. That production in the Unit Area is at an  
advanced stage of depletion and that recovery  
by primary methods is at or near the economic  
limit.

5. That engineering investigations indicate that waterflooding the South Eunice Unit Area will be physically and economically feasible.
6. That agreement between the Working Interest Owners has proceeded to the extent that a logical and systematic secondary recovery operation is assured.
7. That the formation to be unitized and water-flooded is the Seven Rivers and Queen formations which are specifically indicated on the Sonic log of the Continental Oil Company West Arrowhead Deep Unit No. 1 well attached hereto and marked Exhibit 3.
8. That all proposed injection wells are or will be completed in such a manner that injected water will be confined to the unitized formation. The present status of all proposed injection wells is shown on the tabulation of injection well data attached hereto and marked Exhibit 4.
9. That applicant proposes to inject a total of approximately 13,000 barrels of produced water per day into the 30 proposed injection wells on a 80-acre five spot pattern. Said water will be obtained from Jalmat wells adjacent to the unit area or from an outside supplier.
10. That the said waterflood will be installed and operated in conformance with Rule 701E.
11. That the proposed unitization and secondary recovery will result in the recovery of hydrocarbons which would not be recovered by primary methods and is therefore in the interest of conservation and prevention of waste.

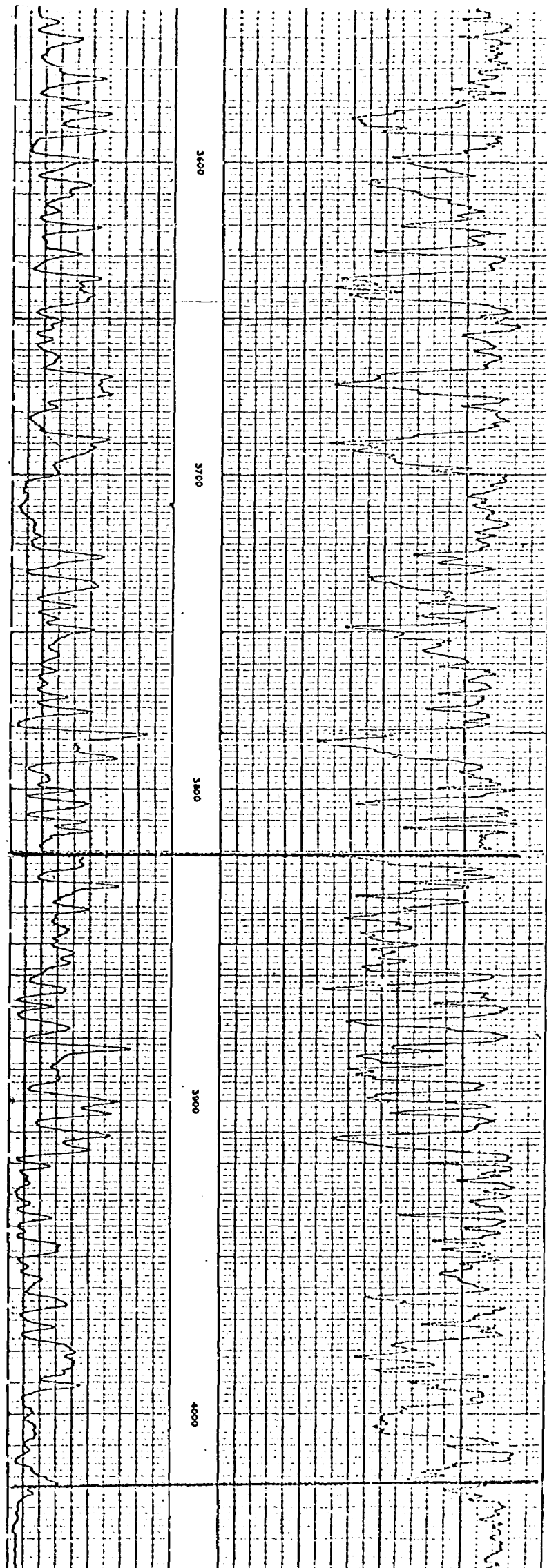
Wherefore, Applicant respectfully requests that this matter be set for hearing before the Commission's duly appointed Examiner and that upon hearing an order be entered approving the South Eunice Unit Agreement, and granting permission to install and operate a waterflood within the Unit Area as described herein above.

Respectfully submitted,  
CONTINENTAL OIL COMPANY

  
G. C. Jamieson

GCJ:rw

CONTINENTAL OIL COMPANY  
West Arrowhead Deep Unit No. 1  
Elev. DF: 3569'



Top of Queen 3821'

Base of Queen and  
Top of Grayburg 4023'

Location: 1980 ENQWL  
Section 17, T22S  
R36E, Lea County  
New Mexico  
EXHIBIT NO 3

SOUTH EUNICE UNIT - INJECTION WELL DATA

COMPANY, LEASE AND WELL NO.	TD PBD	SURFACE CASING			INTERMEDIATE CASING			PRODUCING CASING			PRODUCING INTERVAL
		SIZE	DEPTH	CEMENT	SIZE	DEPTH	CEMENT	SIZE	DEPTH	CEMENT	
Sun DX ✓ D. B. Boren No. 1 660' FNL & 660' FEL Section 20-22-36	3830 3600	12 1/2	211	250	9 5/8	1490	400	7	3687	300	3083-3557
✓ Milhard Deck Kamar Lunt No. 1 1980' FSL & 660' FEL Section 20-22-36	3840 3839	8 5/8	300	75	None			4 1/2	3839	250	3706-3802
Sun DX ✓ H. D. Greer No. 1 660' FNL & 1980' FNL Section 21-22-36	3794 3733	13	202	225	9 5/8	1542	450	7	3693	325	OH 3693-3733
✓ Sun DX H. D. Greer No. 4 1980' FNL & 660' FNL Section 21-22-36	3830	13	208	250	9 5/8	1498	450	7	3708	300	OH 3708-3830
✓ Shell Oil Company D. Christmas No. 1 660' FNL & 660' FEL Section 21-22-36	3884	12 1/2	203	150	9 5/8	1502	450	7	3688	150	OH 3688-3884 Shot 3779-3884
✓ Shell Oil Company D. Christmas No. 3 1650' FNL & 1650' FEL Section 21-22-36	3832	8 5/8	305	300	None			5 1/2	3832	750	3737-3817
✓ Gulf Oil Corporation H. D. Greer No. 1 1980' FSL & 1980' FNL Section 21-22-36	3842 3811	13	32	35	8 5/8	1377	600	6	3695	150	OH 3695-3811 PERF 3146-3560

COMPANY, LEASE AND WELL NUMBER	TD PBD	SURFACE CASING			INTERMEDIATE CASING			PRODUCING CASING			PRODUCING INTERVAL
		SIZE	DEPTH	CEMENT	SIZE	DEPTH	CEMENT	SIZE	DEPTH	CEMENT	
Gulf Oil Corporation H. D. Greer No. 3 660' FSL & 660' FWL Section 21-22-36		3815	8 5/8	276	225	None		5 1/2	3815	1020	3664-3795
Continental Oil Company Christmas D No. 1-D 660' FSL & 1650' FEL Section 21-22-37		3836 3835	9 5/8	305	200	None		5 1/2	3835	650	3614-3815
Skelley Oil Company Christmas "C" No. 1 1980' FSL & 660' FEL Section 21-22-36		3810	8 5/8	335	200	None		5 1/2	3810	200	3716-3807
Sun Oil Company H. S. Record No. 6 1650' FSL & 380' FWL Section 22-22-36		3875	8 5/8	350	250	None		5 1/2	3875	1000	3716-3808
Sun Oil Company H. S. Record No. 4 1980' FSL & 1980' FEL Section 22-22-36		3868	8 5/8	355	250	None		5 1/2	3868	1000	3714-3796
Continental Oil Company Meyer B-22 No. 8 2310' FSL & 1980' FWL Section 22-22-36		3825	8 5/8	358	350	None		5 1/2	3824	1100	3687-3811
Continental Oil Company Meyer B-22 No. 11 1980' FSL & 660' FEL Section 22-22-36		3825 3820	8 5/8	357	325	None		5 1/2	3824	900	3646-3784
Continental Oil Company Meyer B-22 No. 5 660' FSL & 660' FWL Section 22-22-36		3830 3823	8 5/8	1478	700	None		5 1/2	3825	1020	3704-3796

COMPANY, LEASE AND WELL NUMBER	TD PBD	SURFACE CASING			INTERMEDIATE CASING			PRODUCING CASING			PRODUCING INTERVAL
		SIZE	DEPTH	CEMENT	SIZE	DEPTH	CEMENT	SIZE	DEPTH	CEMENT	
Continental Oil Company ✓ Meyer 8-22 No. 6 660' FSL & 1980' FEL Section 22-22-36	3850 3840	8 5/8	1524	700	None	5 1/2	3847	775			3648-3822
Continental Oil Company ✓ Meyer A-29 No. 6 660' FNL & 660' FEL Section 29-22-36	3815 3813	8 5/8	361	350	None	5 1/2	3814				3644-3810
Continental Oil Company ✓ Meyer A-29 No. 8 1920' FSL & 660' FEL Section 29-22-36	3828	8 5/8	384	275	None	5 1/2	3830	1142			3635-3806
Continental Oil Company ✓ Meyer 8-28 No. 7 660' FNL & 1980' FNL Section 28-22-36	3800 3799	8 5/8	359	350	None	5 1/2	3759	900			3612-3793
Continental Oil Company ✓ Meyer 8-28 No. 3 660' FNL & 660' FEL Section 28-22-36	3815 3813	8 5/8	1474	600	None	5 1/2	3814	944			3620-3810
Continental Oil Company ✓ Meyer 8-28 No. 10 1980' FNL & 660' FNL Section 28-22-36	3820 3804	8 5/8	351	350	None	5 1/2	3820	1450			3606-3782
Continental Oil Company ✓ Meyer 8-28 No. 6 1980' FNL & 1980' FEL Section 28-22-36	3810 3809	8 5/8	365	365	None	5 1/2	3809	900			3674-3807

COMPANY, LEASE AND WELL NO.	TD PBD	SURFACE CASING			INTERMEDIATE CASING			PRODUCING CASING			PRODUCING INTERVAL
		SIZE	DEPTH	CEMENT	SIZE	DEPTH	CEMENT	SIZE	DEPTH	CEMENT	
✓ Texas Pacific Coal & Oil Co. B. A. Christmas No. 7 1980' FSL & 1980' FML Section 28-22-36	3817 3803	8 5/8	302	250	None			5 1/2	3815	450	3654-3750
✓ Texas Pacific Coal & Oil Co. B. A. Christmas No. 3 2110' FSL & 330' FSL Section 28-22-36	3802 3800	8 5/8	287	177	None			5 1/2	3800	300	3688-3756
✓ Texas Pacific Coal & Oil Co. B. A. Christmas No. 8 660' FSL & 660' FML Section 28-22-36	3858 3812	8 5/8	310	300	None			5 1/2	3845	400	3589-3700
✓ Atlantic Richfield J. L. Selby No. 4 660' FNL & 660' FML Section 33-22-36	3810 3806	7 5/8	374	250	None			4 1/2	3810	1200	3642-3762
✓ Albert Gackle H. E. Esmond No. 4 1980' FNL & 1980' FEL Section 33-22-36	4005 3918	8 5/8	344	250	None			5 1/2	4005	2300	3616-3852
✓ Continental Oil Company Meyer B-33 No. 9 1980' FSL & 660' FML Section 33-22-36	3825 3665	8 5/8	370	250	None			5 1/2	3814	900	3563-3656
✓ Continental Oil Company Meyer B-33 No. 3 1980' FSL & 660' FEL Section 33-22-36	3851 3761	8 5/8	367	350	None			5 1/2	3850	760	3636-3748
✓ Continental Oil Company Meyer B-33 No. 8 660' FSL & 1980' FML Section 33-22-36	3775	8 5/8	385	350	None			5 1/2	3775	1050	3650-3736

DRAFT

GMH/esr

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. 4459

Order No. R-11068

APPLICATION OF CONTINENTAL OIL COMPANY  
FOR A WATERFLOOD PROJECT, LEA COUNTY,  
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

9:30

This cause came on for hearing at 9 a.m. on November 18, 1970,  
at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this day of November, 1970, 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, Continental Oil Company,  
seeks authority to institute a waterflood project in the  
South Eunice Unit Area, South Eunice Pool,  
by the injection of water into the Seven Rivers and Queen formations  
through 30 injection wells in Sections 20, 21, 22,  
28, 29, and 33,  
Township 22 Nxxxxx South, Range 36 Wxxxx East,  
NMPM, Lea County, New Mexico.

(3) That the applicant further seeks an administrative  
procedure whereby said project could be expanded to include  
additional injection wells in the area of the said project as  
may be necessary in order to complete an efficient injection  
pattern; that said administrative procedure should provide for  
administrative approval for conversion to water injection in  
exception to the well response requirements of Rule 701 E-5  
of the Commission Rules and Regulations.

(SEE UNDER)

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; provided however, that the showing of well response as required by Rule 701 E-5 should not be necessary before obtaining administrative approval for the conversion of additional wells to water injection.

IT IS THEREFORE ORDERED:

(1) That the applicant, Continental Oil Company,  
is hereby authorized to institute a waterflood project in the  
South Eunice Unit Area, South Eunice Pool,  
by the injection of water into the Seven Rivers  
and Queen formations  
30  
through the following-described wells in Township 22  
~~North~~ South, Range 36 ~~West~~ East, NMPM, Lea  
County, New Mexico:

Company	Lease	well no.	Unit	Section
Sun DX	D. B. Bowen	1	A	20
Midland Deck	Lamson Hunt	1	I	20
Sun DX	H. D. Greer	1	C	21
Sun DX	H. D. Greer	4	E	21
Shell Oil Company	D. Christmas	1	A	21
Shell Oil Company	D. Christmas	3	G	21
Gulf Oil Corporation	H. D. Greer	1 (6 to be drilled) (Comp. 100)	K	21
Gulf Oil Corporation	H. D. Greer	3	M	21
Continental Oil Company	Christmas D	1-D	O	21
Shelly Oil Company	Christmas "C"	1	I	21
Sun Oil Company	H. S. Record	6	E	22
Sun Oil Company	H. S. Record	4	G	22
Continental Oil Company	Meyer B-22	8	K	22
Continental Oil Company	Meyer B-22	11	I	22
Continental Oil Company	Meyer B-22	5	M	22
Continental Oil Company	Meyer B-22	6	O	22

designated.

Continental Oil Company	- Meyer B-28 - 7	- C	- 28
Continental Oil Company	- Meyer B-28 - 3	- A	- 28
Continental Oil Company	- Meyer B-28 - 10	- E	- 28
Continental Oil Company	- Meyer B-28 - 6	- G	- 28
Texas Pacific Oil Company	- B.A. Christmas - 7	- K	- 28
Texas Pacific Oil Company	- B.A. Christmas - 3	- I	- 28
Texas Pacific Oil Company	- B.A. Christmas - 8	- M	- 28
Atlantic Richfield	- J.L. Selby - 4	- D	- 33
Albert Hecker	- H.E. Edmond - 4	- G	- 33
Continental Oil Company	- Meyer B-33 - 9	- L	- 33
Continental Oil Company	- Meyer B-33 - 3	- I	- 33
Continental Oil Company	- Meyer B-33 - 8	- N	- 33

(2) That the subject waterflood project is hereby designated the Continental South Embo Unit Waterflood Project and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations;

PROVIDED HOWEVER, that the Secretary-Director of the Commission may approve expansion of the above-described waterflood project to include such additional injection wells in the area of said project as may be necessary to complete an efficient water injection pattern; that the showing of well response as required by Rule 701 E-5 shall not be necessary before obtaining administrative approval for the conversion of additional wells to water injection.

(SEE UNDER)

entry of such further orders as the Commission may deem necessary.

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

CASE 4460: Appli. of CONTINENTAL  
for a non-standard gas proration  
unit, Lea County, New Mexico.