

CASE NO. 5395: SUN OIL CO. FOR  
TWO DUAL COMPLETIONS AND TWO  
TUBING EXCEPTION, LEA COUNTY

CASE No.

5395

Application,

Transcripts,

Small Exhibits

ETC.

BEFORE THE  
NEW MEXICO OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico  
January 2, 1977

EXAMINER HEARING

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IN THE MATTER OF: )  
 )  
 )

Application of Sun Oil Company for two )  
dual completions and two tubing excen- )  
tions, Lea County, New Mexico. )  
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Case No.  
5395

BEFORE: Richard L. Stamets, Examiner.

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the New Mexico Oil  
Conservation Commission:

William Carr, Esq.  
Legal Counsel for the  
Commission  
State Land Office Bldg.  
Santa Fe, New Mexico

For the Applicant:

W. Thomas Kellahin, Esq.  
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Santa Fe, New Mexico

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MR. STAMETS: Call the next case, Case 5395.

MR. CARR: Case 5395. Application of Sun Oil Company for two dual completions and two tubing exceptions, Lea County, New Mexico.

MR. KELLAHIN: Tom Kellahin of Kellahin & Fox appearing on behalf of the Applicant, Sun Oil Company, and I have one witness to be sworn.

MR. STAMETS: The Witness will stand and be sworn, please.

(Witness sworn.)

HERBERT A. SEIDEL, JR.

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you please state your name, by whom you are employed, and in what capacity?

A I am Herbert A. Seidel, Jr., and I am a Professional Engineer for Sun Oil Company, located in Dallas, Texas.

Q Mr. Seidel, have you previously testified before the Commission and had your qualifications as an expert accepted and made a matter of record?

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A Yes, I have.

Q Are you familiar with the facts surrounding this particular Application by Sun Oil Company?

A I am.

MR. KELLAHIN: If the Examiner please, are the Witness' qualifications acceptable?

MR. STAMETS: They are.

BY MR. KELLAHIN:

Q Would you please refer to what has been marked as Applicant's Exhibit No. 1 and describe for the Examiner's benefit what Sun Oil Company is seeking in this Application?

A We'd like authority to dual complete a couple of wells in Section 1, Township 22 South, Range 37 East, on Sun's Walter Lynch lease. It is 120 acres located in the Southwest quarter of Section 1. Specifically, these wells are No. 1 and No. 2 in the Northeast and Southwest quarter of the Southwest quarter, Section 1. We require an exception to tubing within 200 feet of perforated intervals.

Q That's Rule 107?

A Rule 107, right.

Q All right, sir, and --

A (Interrupting) And possible exception, failing

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SEIDEL-DIRECT

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approval of this alternate we would like an exception to the 1.67 ID State wide rule.

Q And that appears in Rule No. 112?

A Thank you.

MR. STAMETS: I believe you identified these as 1 and 2 .

MR. SEIDEL: It should be 1 and 3.

MR. STAMETS: Okay.

BY MR. KELLAHIN:

Q Would you begin by giving us some background for your particular request today?

A Yes, I would. I should like to note at the outset Sun made the decision to utilize existing Paddock wells which were producing on the order of 3 to 12 barrels of oil per day to develop the Drinkard and Granite Wash production on its Walter Lynch Lease. This I believe makes Sun's position unique with respect to the competitive position technique, completion technique, in this area. Uncertainty of Granite Wash production on the lease prior to development indicated a possible outcome for these wells of a dual completion in the Drinkard and Paddock. This, of course, would have permitted compliance with the New Mexico Conservation Commission's state-wide rules regulating

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the tubing point and minimum tubing size for oil wells. The Paddock perforations would have been within a few feet of the 2-inch casing. This is, for the record, what happened on Sun's Walter Lynch No. 2 encountering a gas gap in Granite Wash which is located in the Northwest quarter of the Southwest quarter of Section 1. That well is a dual in the Paddock and Drinkard.

The Paddock-Drinkard dual completion would not have been deep within the 5-inch line as it is with the Drinkard Granite Wash duals we have and the Walter Lynch Well No. 3. So, it can be seen that we were facing, in our evaluation of development alternatives, a real possible outcome of a single Drinkard completion and cost of a new well with a "drill new well" alternative which was not comparatively attractive economically as the "deepen existing well" alternative.

Moving on to the existing completion techniques of the Sun Walter Lynch No. 1, which we feel is the best not only from an economic standpoint but from a practical standpoint, maximizing recovery from each zone, the Drinkard and Granite Wash. The Granite Wash and the Walter Lynch No. 1 has declined in production from 185 barrels a day to 137 barrels a day during the last four months,

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and on November, 1974, while the Walter Lynch N. 3 has declined from 67 to 35 barrels of oil per day during this same period. This indicates that artificial lift will be required for the Granite Wash in the near future. Since this more important zone will require pumping below a packer, which is most inefficient, requiring the pumping of gas, we'll endeavor to install as large a pump as possible for this zone. Historically the Drinkard or upper zones has a very long flowing life and is indicated to flow to primary depletion. Sun is anxious to obtain the Commission's approval of an acceptable completion for these two wells as soon as possible in order that we may begin production to prevent further drainage from the Drinkard in this pool.

Q Would you turn your attention now to the Walter Lynch N. 1 K Well and Exhibit No. 2 and explain briefly what information is contained on that Exhibit?

A This is our proposed completion represented as a diagrammatic sketch on the Sun Oil Company Walter Lynch No. 1, Unit K, Section 1, Township 22 South, Range 37 East. This is the existing completion for this well at this time with the exception of an Otis sliding side door we're proposing to locate about 7100 feet or some 40 feet

above the packer at 7139 feet for the lower zone of Granite Wash. You see, the Granite Wash is perforated from 7442 to 44. This is the lower zone. The upper zone is perforated from 6849 to 6946 in the Drinkard. These perforations are some 1800 feet below the tubing being for the upper tubing string. The upper packer is located about 900 feet in 7-inch casing. Tubing size for the lower zone is 2-7/8; tubing size for the upper zone is 2-inch OD buttress thread tubing.

Q What do you seek to accomplish with the installation of this Otis sliding side door?

A First, the larger tubing will permit a large pump to be installed and permit us to get maximum rates below packer for the zone and the Otis sliding side door will provide for us a method of unloading annular volume should the Drinkard load up and die. We can go in and with a wire line tubes we can open the side door, which automatically will shut off the lower zone and permit the upper or annular zone to flow into the lower tubing string. We can swab the well and swab it until it begins flowing again.

Q All right. Would you please refer to what has been marked as Exhibit No. 3 and identify it?

A This is an alternate completion for the well.

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getting the Commission's approval for this initial proposal. The only difference between this alternate and the original suggestion is that we have to go to a smaller-size tubing for the lower zone, it's reduced from 2-1/2 to 2-3/8, for the upper string we run a small macaroni string 1 inch 1.315 O.D. high drill tubing to a point approximately 40 feet above the Drinkard perforations.

Q Are there any disadvantages for this second alternative?

A We get into it later on some flow efficiency in the smaller tubing there, but there is also a lack of an opportunity to set a larger pump than if we had had 2-7/8-inch OD tubing.

Q Those are the two disadvantages in summary fashion to this particular alternative?

A Yes, sir.

Q All right, sir. Now, would you refer to Exhibit No. 4 and explain what information this contains?

A This is a graphical presentation of calculated bottomhole pressures along the traverse from the tubing to the bottomhole perforated interval. We have plotted on the vertical axis pressure, on the horizontal axis depth of 10,000 of feet. We focus our attention on the lower

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set of curves which is for the upper Drinkard, upper tubing producing from the Drinkard. You'll note from a depth of 0 to 5000 feet we have two different cases: One of 1932 cubic feet per barrel and another of 6000 cubic feet per barrel. I forgot to mention that these calculations are utilizing a program which Sun purchased from Shell Oil Company in the mid '60s and has been found to be accurate within 5 to 10 percent on predicting or calculating the actual bottomhole flowing pressure conditions. The incremental difference or comparison basis is indicated to be very accurate and certainly within measurement accuracy if we were to run a bomb and measure these pressures. We gave a spread on GOR here to see what the effect or sensitivity to gas-oil ratio would be for pressure drop within this production system. Continuing on from 5000 feet on down to the perforated interval at about 6850 feet we have a set of three curves. That upper-dashed curve is for the 1.049 macaroni string of tubing, the CS-hydr tubing, the next lower curve is for the annular flow system with the 2.875 OD tubing and the 4.40 ID casing. The next lower curve was added for 1.995 ID or 2-1/2 2-inch nominal EUE tubing. Although this is not really possible within this well, we just wanted to see

what it would look like with nominal-size tubing. From these 3 end points we can see that this 1.995 ID tubing will produce the least amount of pressure drop, or would be the most efficient tubing size for this particular flowing condition. The next most efficient would be the annular flow system which we now have in the well, and the least would be the 1-inch tubing.

Going on down and looking at the 6000 cubic foot per barrel, the same effect is noted. The pressure drop difference between the 1-inch and the 2-inch tubing is somewhat larger; it is about 140 pounds total difference between the 2-inch and the 1-inch as compared to the lower GOR of about 60 pounds. The effects to the lower tubing are Granite Wash at the potential rates for 2 GORs, 1313 cubic feet per barrel and 6000 cubic feet per barrel, are very minimal. See, for the 2-1/2-inch tubing compared to the 2-inch tubing you have only about 30 pounds difference in the two strings. It's interesting to note that the smaller-size tubing is more efficient than the larger size. You have less pressure drop with the smaller-size tubing. I believe that concludes it.

Q Would you please refer to Exhibit No. 5 and identify it?

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A This is a tabulation of all the data plotted on the previous exhibit with the exception of the 2-inch tubing for the upper tubing Drinkard completion.

Q What is the purpose of this Exhibit?

A This details the length of tubing being produced through for the proposed and alternate systems for the upper and lower tubing giving the OD and ID on the tubing, the flow areas square inches, and the pressure at the depth of each segment considered. I would like to point out that we have ignored the fact that we do have some annular flow between the 7-inch casing and the 2-1/2-inch casing, some 112 feet. We assume that the liner extended up to the upper packer.

Here comparing the upper tubing for the two alternative methods of completion, again we can see that the annular flow case is the more efficient of the two methods. I might mention at this point that we did not consider the effects in the annular flow case of collars. These consist of about 25 feet at length or some 1.4 percent of the total 1833-foot length of annular flow that we're looking at.

The annular flow area through the collars is 5.64 square inches as compared to 8.77 square inches for

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the tubing casing annulus.

Q Would you please refer now to Exhibit No. 6 and identify it?

A Yes, sir. This is our first four computer print-out sheets for the runs that are summarized on the previous Exhibit and plotted on the one before that one. We have for this first Exhibit No. 6 an upper tubing 1932 cubic feet per barrel. This first line that runs clear across the page, the first four sets of data, are the input data that were used to make the calculations.

This first segment is the upper section or 1.67 ID tubing; the depth begins at 0 and ends up at 5004 for this first or upper segment. The next segment, the first one that we worked with for the 1-inch tubing, the nature of the thing is that, we to begin with, the pressure that we had on the upper section at the 5004-foot depth; you have 606.8 psi. You will note that this same pressure is at the 0 depth at the computer put-out, which is equivalent to 5004 feet which we tacked in over in the right-hand column there.

Another alternative lower section was, of course, the annular -post system and so forth, the lower section.

One piece of this input data might not be too clear. On this second line you look to the top of the Exhibit over to the right-hand side, the second number from the left is viscosity and center points. This is input for standings correlation for PVT data and this is viscosity at 100 degrees fahrenheit and 14.7 psi. This is also true for the surface tension conditions.

Q Would you refer now to Exhibit No. 7 and summarize the information that is contained on that Exhibit?

A This is similar data to Exhibit 6 for the upper tubing and 6000 cubic feet per barrel. The same segments were used as on the previous Exhibit.

Q And Exhibit 8?

A Similar to the previous Exhibit but for the lower tubing, 1313 cubic feet per barrel GOR. Here we used two segments below the upper segment; we used the 2-inch and 2-1/2-inch alternatives.

Q Exhibit No. 9?

A Exhibit 9 is the computer print-out for the lower tubing used in the 6000 cubic feet per barrel; identical to the previous Exhibit except for that.

Q Now refer to what has been marked as Exhibit No. 10 and identify it?



A Yes, sir. This is a schematic diagram of the proposed completion for the other well included in the Application for Walter Lynch No. 3. There is a little difference in the depth information. Again I point out that tubing point is about 4911 with perforations tentatively indicated to be about 6240 feet, or about 1200 feet difference from the tubing point to the perforated intervals. The Otis sliding side door is again about 40 feet indicated or suggested that we would place it about 40 feet above the packer at 7049 feet. We would like to use 2-7/8-inch tubing for the long string or for the lower tubing and the 2-inch buttress thread tubing for the upper completion interval.

Q Would you refer to Exhibit No. 11 and identify it?

A This is an alternate similar to the alternate No. 1 presented for the Walter Lynch No. 1, which we would suggest failing approval of the proposed completion. The only difference here is that we have again the 1-inch tubing extending down within 40 feet of the proposed-perforated interval. Again, we use the Otis side door in the lower tubing.

Q Are there any disadvantages to this proposal as

set forth on Exhibit No. 8?

A Yes, sir, the same disadvantages would hold for this one. We would be limited in the size of pump that would we would be able to install, the pump, some high gas-oil ratio production below packer, plus a less efficient flow system for the upper tubing completion.

Q Is there anything else you would like to add with regard to your testimony?

A I believe not.

Q In your opinion, would the approval of this Application be in the best interest of conservation, the prevention of waste and the protection of correlative rights?

A Yes, it would.

Q Were Exhibits 1 through 11 either prepared by you directly or under your direction and supervision?

A They were.

MR. KELLAHIN: If the Examiner please, we move the introduction of Exhibits 1 through 11.

MR. STAMETS: Exhibits 1 through 11 will be admitted.

(Whereupon, Sun's Exhibits Nos.  
1 through 11 were admitted into evidence.)

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MR. KELLAHIN: That concludes our direct testimony.

CROSS EXAMINATION

BY MR. STAMETS:

Q Mr. Seidel, referring to Exhibit No. 4 and to the lower tubing first, did I understand you to say that the smaller tubing would be more efficient?

A Yes, sir.

Q But, this is not considering that you would have to pump it and you would achieve better pumping conditions with the larger tubing?

A No, sir, they are not directly related. This merely considers the flowing condition for the well and if we had to pump the well the pumping situation would be much better with the 2-1/2-inch or 2.441 ID tubing.

Q Now, referring to the upper zone, the comparing potential for running two-inch and one-inch, as the gas-oil ratio climbs, the efficiency of the one-inch tubing drops substantially in comparison to the two-inch?

A I believe that's about 20 pounds difference there. The top point is about 840 pounds and this is with the 1932 GOR. The next point right directly below it in the triangle is the 6000 cubic foot per barrel for the 1.049 ID case.

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The difference between the 2-inch tubing for the 2 GOR cases seems to be about the largest difference of the three cases presented. You would have about 60 pounds spread there as opposed to the 20 for the 1-inch.

Q What I'm getting at, does this indicate that with your 1-inch tubing you are going to get good efficiency or poor efficiency as the gas-oil ratio climbs?

A We'd get poor efficiency because -- I'm in error. You are correct; you do get better efficiency as the GOR climbs. As you come down in pressure, this means your pressure drop is going to be less, you're correct; I stand corrected.

Q And then you would have somewhat poorer efficiency with annular flow for the 1932?

A Yes.

Q And then a poorer differential; as the gas-oil ratio increases you would lose more efficiency with the annular flow?

A This is correct. We are talking about a difference of about 70 pounds on the GOR change for sensitivity that we're looking at for the annular flow. The GOR appears to be more efficient; the higher GOR provides a more efficient flow system. The pressure drop is less.

Q And the 2-inch tubing is out of the question?

A Yes, sir.

Q How critical will your gas situation be with the smaller-size tubing in the lower string?

A It is very insensitive to it; you don't see the spread --

Q (Interrupting) No --

A (Interrupting) I don't understand your question.

Q Let me rephrase that question. You have indicated that the reason you want to run the larger-size tubing to the lower depth is to increase your efficiency of pumping because of gas problems in there.

A Yes, sir.

Q How critical is this to your tubing size? Have you made any estimate as to what you might lose in production, lose in efficiency between those two tubing sizes when you go on pump?

A No, sir, I haven't. Of course, it would be directly related to the GOR. I would say that GORs down around the 2000 to 1 range as compared to the 6000 you would have a tremendous loss in productivity. Pressures would be low and you'd be pumping gas volume that would have a very small -- a very large reservoir or volume

within the pump. We have not made any calculations.

Q Are there new pumps available especially designed for lifting high gas-oil ratio oil?

A Yes, sir, there are, and they provide for different types of bypasses. I have not kept up with these changes but I do understand that there are bypasses that can be installed. Now, whether we could get it through both packers and get us back up into the annular space above the upper packer, I don't know whether this is possible or not.

Q I believe you said that in all of your calculations you ignored the potential for cavitation of the gas around the collars, tubing collars and the annular space?

A Yes, sir, I did, and I implied it and I say it now: I don't think that it would seriously change the results if we had considered cavitation around the collars.

Q And if you had made the calculations relative to Well No. 3, which you have shown us here, relative to Well No. 1, they would show essentially the same sort of situation?

A Yes, sir, they would.

Q And we can have these calculations apply to both wells?

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A Yes, sir.

Q Do you feel if you would be forced to run the smaller-size tubing to the lower zone and run 1-inch tubing down to near the top of the Drinkard zone that the ultimate production from these two zones would be significantly adversely affected?

A I don't feel they would for the upper zone, but for the lower zone I think that we could run into some serious problems. I think the ultimate recovery there would be affected. I feel that when we have to begin pumping this completion below packer, the gas-oil ratios do get on up fairly high and we expect them to get up into the 3-to-4000 range, that ultimate recovery could be seriously affected with the smaller pump that we have to use. I would hazard a number of something on the order of 10,000 barrels.

Q This is an estimate though?

A Yes, sir.

Q Not considering the potential for a special gas lifting pump or bypass pumps that may or may not be rentable in this particular well?

A Yes, sir, that's right.

Q Have you made any estimate of what the increased

efficiency with the 1-inch tubing in the upper zone, what you might recover extra out of that zone?

A I really don't think that our running that tubing string there would change the ultimate recovery from that zone in either one of these two wells. Did I answer your question?

Q Yes. With better flow efficiency, though, it would seem like the well would produce more.

A I really don't think that the final producing condition of the bottomhole flowing pressure at the time that that completion was abandoned would be significantly different from that before in assuming that others aren't draining this completion and that this completion is draining this volume that it should, the 40 acres of proration unit that it is in. I really think that a few pounds difference, say 20 to 30 pounds, would not seriously change the ultimate recovery.

Q Do you have any expectation of the producing life of these two zones?

A Yes, sir. Approximately 10 years.

Q For both?

A For each one of them. Here again I'm assuming -- Oh, excuse me. For the lower zone about 10 years and



about 12 years for the upper zone, for both wells. I might mention that we do have a gas cavity in this Granite Wash. I mentioned this earlier, but I point it out again, and if it is large enough to expand and replace the voidage in the oil column then we could be faced with some real high GORs in this well and possibly this zone would flow to completion under this circumstance. We don't know how large the cavity is and whether it would really support a good expansion into the oil column but we have that zone shut-in; it's below plug.

MR. STAMETS: Are there any other questions of this Witness?

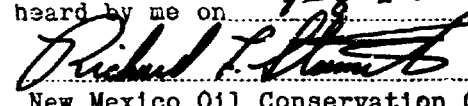
MR. KELLAHIN: No, sir.

MR. STAMETS: He may be excused. Anything further in this Case? We will take the Case under advisement.

STATE OF NEW MEXICO     )  
                                  )  
COUNTY OF SANTA FE     )     SS.

I, RICHARD L. NYE, Court Reporter, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me, and the same is a true and correct record of the said proceedings, to the best of my knowledge, skill and ability.

  
RICHARD L. NYE, Court Reporter

I do hereby certify that the foregoing ~~to~~  
a complete record of the proceedings in  
the Examiner hearing of Case No. 5395  
heard by me on 1-8-76 1976  
, Examiner  
New Mexico Oil Conservation Commission

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# OIL CONSERVATION COMMISSION

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

**I. R. TRUJILLO**  
CHAIRMAN

LAND COMMISSIONER  
PHIL R. LUCERO  
MEMBER

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

Re: CASE NO. 5395  
ORDER NO. R-4993

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

Applicant:  
**Sun Oil Company**

Dear Sir:

Enclosed herewith are two copies of the above-referenced Commission order recently entered in the subject case.

Very truly yours,

A. L. PORTER, Jr.  
Secretary-Director

ALP/ir

Copy of order also sent to:

Hobbs OCC	<u>          x          </u>
Artesia OCC	<u>                          </u>
Aztec OCC	<u>                          </u>

Other \_\_\_\_\_

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. 5395  
Order No. R-4993

APPLICATION OF SUN OIL COMPANY  
FOR TWO DUAL COMPLETIONS AND  
TWO TUBING EXCEPTIONS, LEA  
COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on January 8, 1975, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 1st day of April, 1975, 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, Sun Oil Company, is the owner and operator of its Walter Lynch Wells Nos. 1 and 3, located in Units K and M, respectively, of Section 1, Township 22 South, Range 37 East, NMPM, Lea County, New Mexico.

(3) That the applicant proposes to complete said wells as dual oil completions in the Drinkard and Wantz-Granite Wash Pools as follows:

WALTER LYNCH WELL NO. 1

Production from the Drinkard Pool through 1.315-inch OD tubing from approximately 6800 feet to 5000 feet, thence to the surface through 2-inch OD tubing, and production from the Wantz-Granite Wash Pool through 2 3/8-inch OD tubing from approximately 7138 feet to 5000 feet thence to the surface through 2 7/8-inch OD tubing with separation of the zones by packers set at approximately 5000 feet and 7139 feet.

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Case No. 5395  
Order No. R-4993

WALTER LYNCH WELL NO. 3

Production from the Drinkard Pool through 1.315-inch OD tubing from approximately 6200 feet to 4897 feet, thence to the surface through 2-inch OD tubing, and production from the Wantz-Granite Wash Pool through 2 3/8-inch OD tubing from approximately 7048 feet to 4897 feet, thence to the surface through 2 7/8-inch tubing with separation of the zones by packers set at approximately 4900 feet and 7049 feet.

(4) That the mechanics of the proposed dual completions are feasible and in accord with good conservation practices.

(5) That approval of the subject application will prevent waste and protect correlative rights.

IT IS THEREFORE ORDERED:

(1) That the applicant, Sun Oil Company, is hereby authorized to dually complete its Walter Lynch Wells Nos. 1 and 3, located in Units K and M, Respectively, of Section 1, Township 22 South, Range 37 East, NMPM, Lea County, New Mexico, to produce hydrocarbons as follows:

WALTER LYNCH WELL NO. 1

Production from the Drinkard Pool through 1.315-inch OD tubing from approximately 6800 feet to 5000 feet, thence to the surface through 2-inch OD tubing, and production from the Wantz-Granite Wash Pool through 2 3/8-inch OD tubing from approximately 7138 feet to 5000 feet thence to the surface through 2 7/8-inch OD tubing with separation of the zones by packers set at approximately 5000 feet and 7139 feet.

WALTER LYNCH WELL NO. 3

Production from the Drinkard Pool through 1.315-inch OD tubing from approximately 6200 feet to 4897 feet, thence to the surface through 2-inch OD tubing, and production from the Wantz-Granite Wash Pool through 2 3/8-inch OD tubing from approximately 7048 feet to 4897 feet, thence to the surface through 2 7/8-inch tubing with separation of the zones by packers set at approximately 4900 feet and 7049 feet.

PROVIDED HOWEVER, that the applicant shall complete, operate, and produce said wells in accordance with the provisions of Rule 11.2-A of the Commission Rules and Regulations insofar as said rule is not inconsistent with this order;

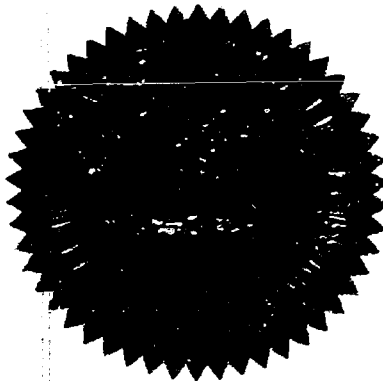
-3-

Case No. 5395  
Order No. R-4993

PROVIDED FURTHER, that the applicant shall take packer leakage tests upon completion and annually thereafter during the annual gas-oil ratio test period for the Wantz-Granite Wash Pool.

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

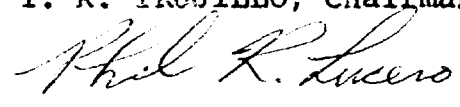
DONE at Santa Fe, New Mexico, on the day and year herein-  
above designated.

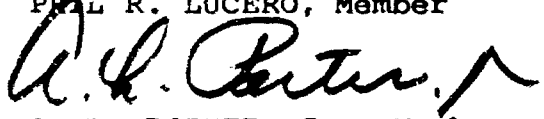


S E A L

STATE OF NEW MEXICO  
OIL CONSERVATION COMMISSION

  
I. R. TRUJILLO, Chairman

  
PHIL R. LUCERO, Member

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

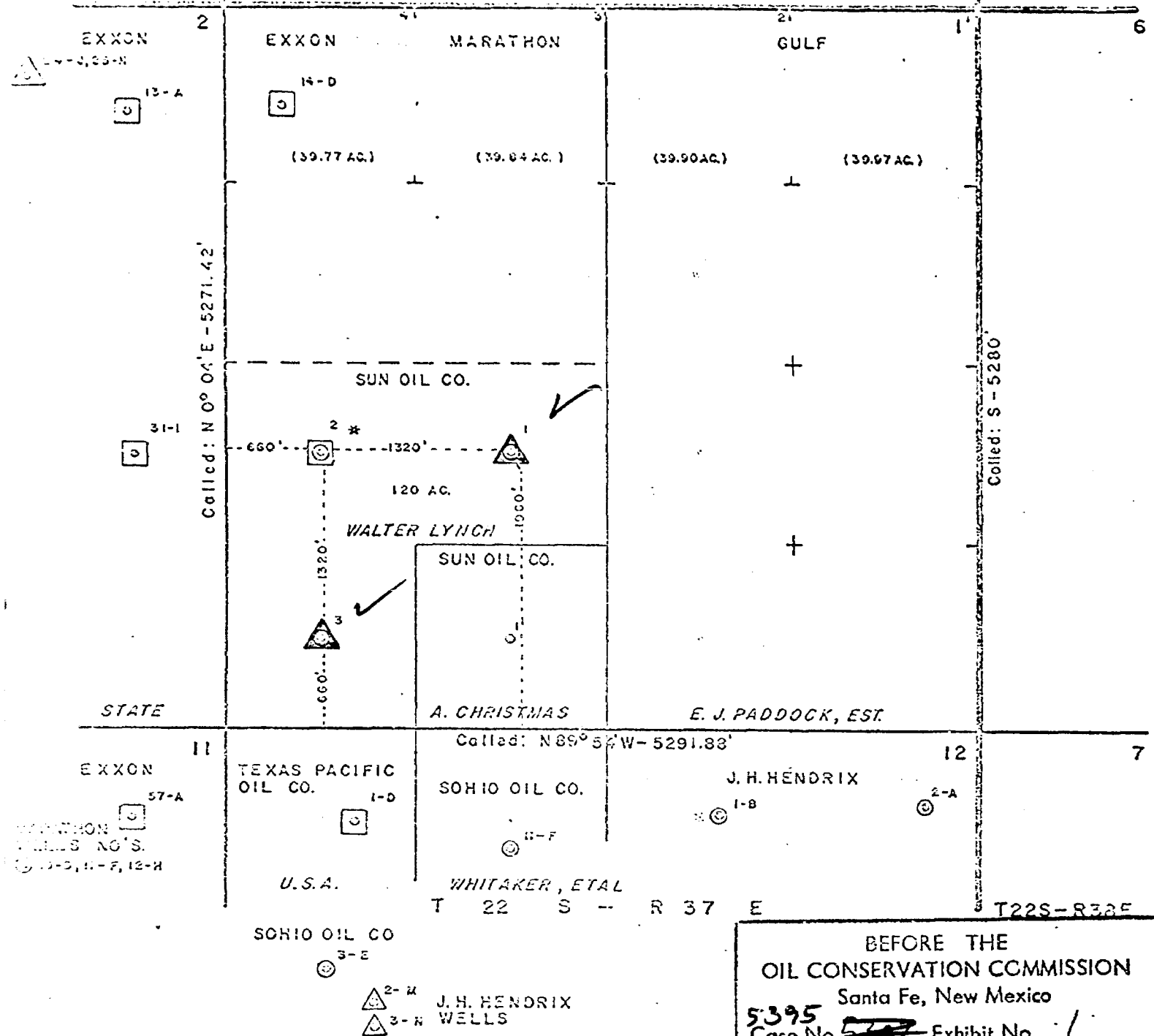
jr/

Originals

T 21 S - R 37 E

T 21 S - R 33 E

Called: S 89° 59' E - 5280'



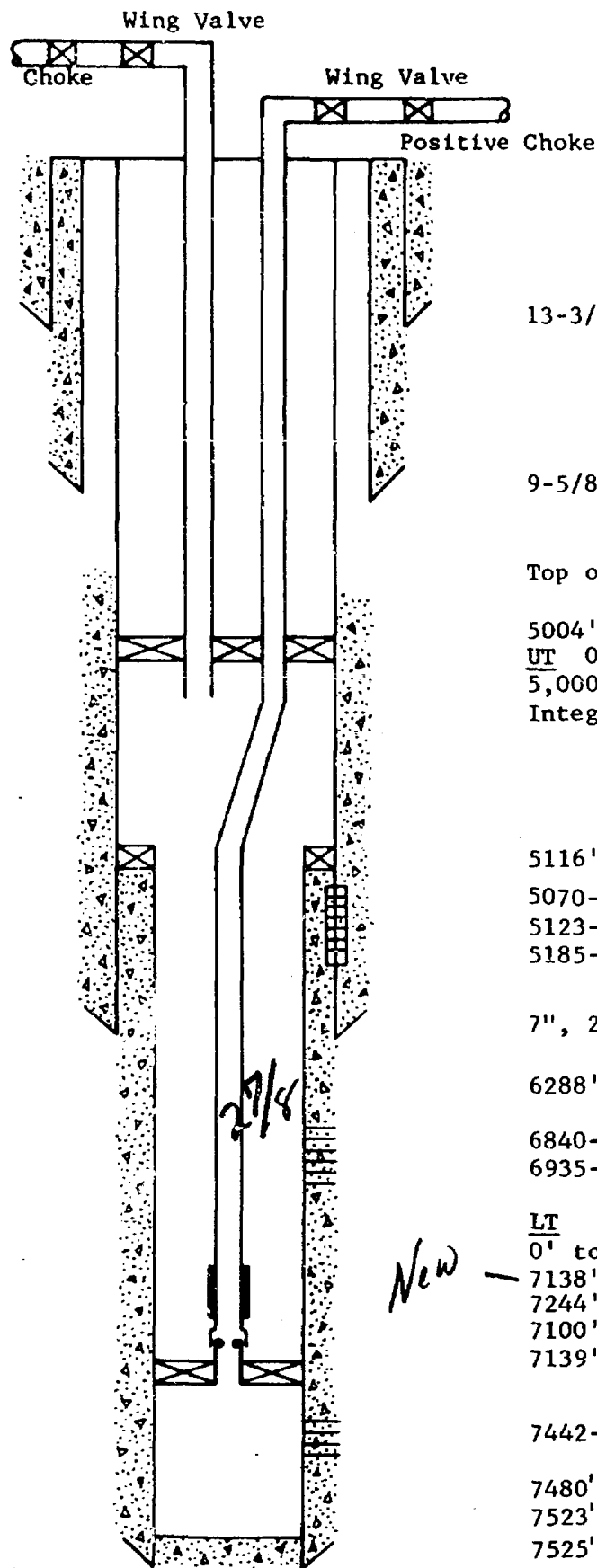
- LEGEND
- ⊙ DRINKARD PRODUCERS
  - △ GRANITE WASH PRODUCERS
  - ☑ PADDOCK PRODUCERS
  - \* PRESENTLY PADDOCK PRODUCER SCHEDULED TO BE RECOMPLETED AS PADDOCK-DRINKARD DUAL

BEFORE THE  
OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico  
Case No. 5395 Exhibit No. 1  
Submitted by SUN OIL  
Hearing Date 8-20-75  
SUN OIL COMPANY

WALTER LYNCH - 120 AC. LSE.  
OUT OF  
SW/4 SEC. 1, T22 S - R37 E  
LEA CO., NEW MEXICO  
SCALE: 1" = 1000'

PROPOSED COMPLETION  
DIAGRAMMATIC SKETCH

SUN OIL COMPANY  
WALTER LYNCH NO. 1 K  
SEC. 1, T-22-S, R-37-E



BEFORE EXAMINER STAMETS  
OIL CONSERVATION COMMISSION  
SUN EXHIBIT NO. 2  
CASE NO. 5395  
Submitted by \_\_\_\_\_  
Hearing Date 8 Jan 75

13-3/8", 40# @ 326' w/350 sx.

9-5/8", 36# @ 2848' w/2500 sx.

Top of Cement 3700'

5004' 7" x 2-1/2" x 1-1/2" Otis 23 RDH Hyd. Packer  
UT 0' to 5000' 2" OD 3.4#, J-55 Butress Thread Tbg.  
5,000' to 5014 (through packer) 1-1/2" (1.660" OD)  
Integral Joint, 5010' Otis "N" Nipple.

5116' TIW Type J Hanger & Type L Packer  
5070-5090' } Paddock Perforations  
5123-5146' } Squeezed w/200 sx.  
5185-5215' }

1800'  
Not by

7", 23# @ 5255' w/350 sx

6288' Top of Drinkard Zone

511

6840-6906' } Drinkard Perfs  
6935-6956' }

LT  
0' to 7138' 2-7/8" OD EUE 8 RD J-55 6.5#/ft. Tbg  
7138' Otis 2-3/8" Seal Divider w/"N" Receptacle  
7244' Top of Wantz Granite Wash zone  
7100' Otis Sliding Side-Door  
7139' 5" x 2-3/8" Otis Perma Latch Packer

New

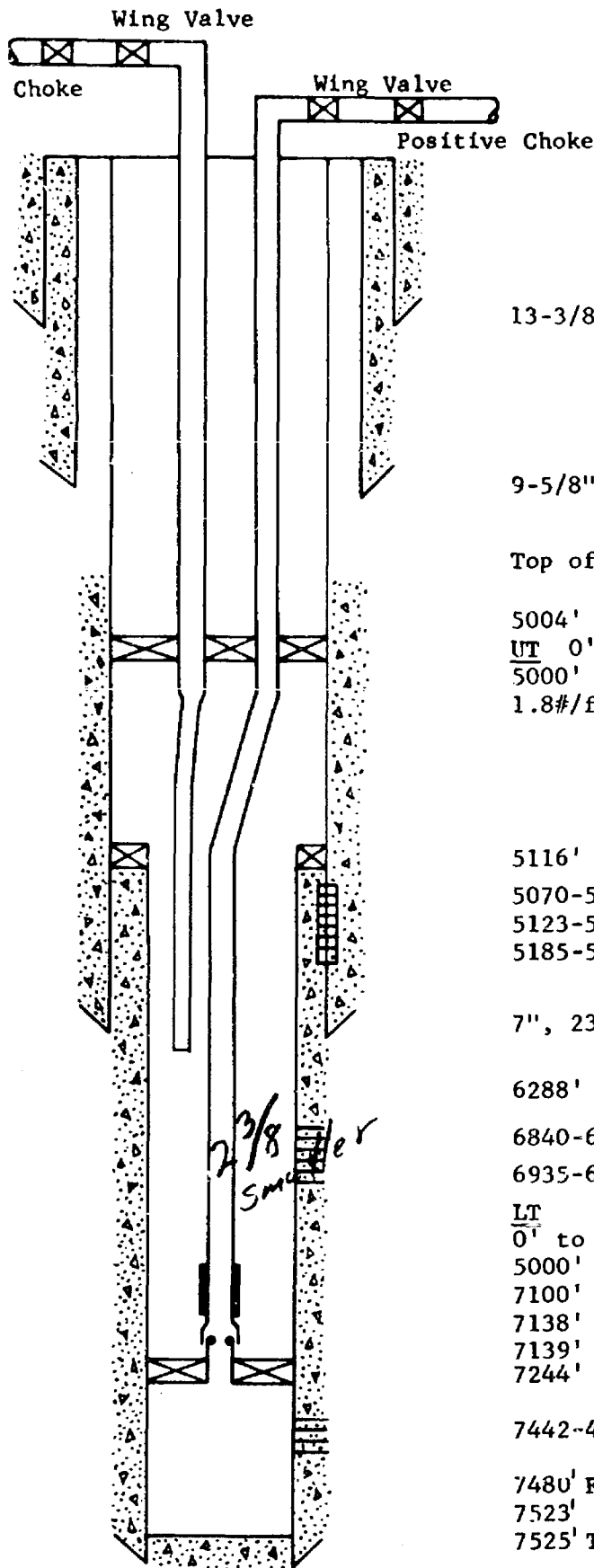
7442-44' Wantz Granite Wash Perfs

7480' FC and PBTD  
7523' 5", 15# w/200 sx. Circ around pkr. @ 5116'.  
7525' TD



PROPOSED COMPLETION  
DIAGRAMMATIC SKETCH  
(ALTERNATE NO. 1)

SUN OIL COMPANY  
WALTER LYNCH NO. 1 K  
SEC. 1, T-22-S, R-37-E



BEFORE EXAMINER STAMETS  
OIL CONSERVATION COMMISSION  
SUN EXHIBIT NO. 3  
CASE NO. 5395  
Submitted by \_\_\_\_\_  
Hearing Date 8 Jan 75

13-3/8", 40# @ 326' w/350 sx.

9-5/8", 36# @ 2848' w/2500 sx.

Top of Cement 3700'

5004' 7" x 2-1/2" x 1-1/2" Otis 23 RDH Hyd. Packer  
UT 0' to 5000' 2" OD 3.4#, J-55 Butress Thread Tbg.  
5000' to 6800' 1" (1.315 OD) CS Hydril Tbg.  
1.8#/ft.

5116' TIW Type J Hanger & Type L Packer  
5070-5090' } Paddock Perforations  
5123-5146' } Squeezed w/200 sx.  
5185-5215' }

7", 23# @ 5255' w/350 sx

6288' Top of Drinkard Zone

6840-6906' } Drinkard Perfs  
6935-6956' }

LT  
0' to 5000' 2-7/8" OD EUE J-55 6.5#/ft. Tbg.  
5000' to 7138' 2-3/8" OD NU, J-55 4.6#/ft. Tbg.  
7100' Otis Sliding Side-Door  
7138' Otis Seal Divider W/N Receptacle  
7139' 5" x 2-3/8" Otis Perma Latch Pkr.  
7244' Top of Wantz Granite Wash Zone

7442-44' Wantz Granite Wash Perfs

7480' FC and PBTD  
7523' 5", 15# w/200 sx. Circ around pkr. @ 5116'.  
7525' TD

5255  
5116  
139

SUN OIL COMPANY  
WALTER LYNCH #1  
WANTZ FIELD  
LEA COUNTY, NEW MEXICO  
DUAL COMPLETION ALTERNATIVES

<u>Depth</u>	<u>Length, Ft.</u>	<u>O.D.</u>	<u>I.D.</u>	<u>Flow Area Sq. In.</u>	<u>Pressure at Depth, Psi</u>	
					<u>Pot. GOR</u>	<u>6000 cf/bbl.</u>
<u>Proposed</u>						
<u>Upper Tubing</u>						
0-5000'	5000	2" Buttress	1.67"	2.19	606	533
5000-5014'	14	Pkr. Integral Jt.	1.66"	2.16	607	534
5010-6843'	1833	**2-7/8"	4.408"	8.77	813*	742*
<u>Lower Tubing</u>						
0-7138'	7138	2-7/8"	2.441"	4.68	1539	1158
<u>Alternate No. 1</u>						
<u>Upper Tubing</u>						
0-5000'	5000	2" Buttress	1.67"	2.19	606	533
5000-6843'	1843	1.315" CS Hyd.	1.049"	0.86	838	819
<u>Lower Tubing</u>						
0-5000'	5000	2-7/8"	2.441"	4.68	1061	910
5000-7138'	2138	2-3/8" NU	1.995"	3.13	1512*	1149*

\*More efficient - lesser pressure drop.

\*\*In 5" OD Casing

UT Potential 148 BOPD - 250# FTP - 1932 cf/bbl. Perfs. 6840-6956 (Drinkard)  
 LT Potential 211 BOPD - 500# FTP - 1313 cf/bbl. Perfs. 7442-44 (Granite Wash)

UPPER TUBING  
1932 CF/BBL

PRESSURE GRADIENT CALCULATION  
VERTICAL GAS/LIQUID FLOW

Viscosity  
100 cP

2-Case No. 43.5000 API .7000 S.G. Sep. Gas .9000 S.G. Th. Vap. 150.0000 F@B.P. 2700.0000 P<sub>sp</sub> 25.0000 P<sub>sep</sub> 1.4000 B<sub>g</sub>  
1932.0000 c.f./M 43.5000 .7000 .9000 25.0000 P<sub>sep</sub> 1.0000 S.G. 2.0000 M<sub>g</sub>-Cp. 30.0000 Surf. Tens.  
250.0000 FTP 80.0000 F Tubg. 148.0000 F BH 5004.0000 Depth 1.6700 I.D. Tubg. -0.0000 O.D. Tubg.  
148.0000 BPD -0.0000 285936.0000 c/d 1.6700 I.D. Tubg. -0.0000 O.D. Tubg.  
or Csg. 14.7 psi -0

PRESSURE (PSIA)	DEPTH (FT)
250.0000000	0.0000000
300.0000000	808.98272244
360.0000000	1723.68767594
432.0000000	2752.39272192
518.4000000	3504.73334101
606.76336306	5004.00000000

UPPER SECTION - 1.67" I.D.

202	43.5000	.7000	.9000	150.0000	2700.0000	25.0000	1.4000
1932.0000	43.5000	.7000	.9000	25.0000	1.0000	2.0000	30.0000
606.0000	80.0000	148.0000	1836.0000				
148.0000	-0.0000	285936.0000	1.0490	-0.0000			-0

PRESSURE (PSIA)	DEPTH (FT)
606.0000000	0.0000000 5004
727.2000000	953.26733612 5957
838.49543333	1836.00000000 6840

LOWER SECTION - 1.849" I.D.

2	43.5000	.7000	.9000	150.0000	2700.0000	25.0000	1.4000
1932.0000	43.5000	.7000	.9000	25.0000	1.0000	2.0000	30.0000
606.0000	80.0000	148.0000	1836.0000				
148.0000	-0.0000	285936.0000	4.4080 Csg. I.D.	2.6750 Tubg. O.D.			-0

PRESSURE (PSIA)	DEPTH (FT)
606.0000000	0.0000000 5004
727.2000000	1137.77676994 6142
812.91437925	1836.00000000 6840

LOWER SECTION - 1.408" Csg. I.D.  
2.675" Tubg. O.D.

2	43.5000	.7000	.9000	150.0000	2700.0000	25.0000	1.4000
1932.0000	43.5000	.7000	.9000	25.0000	1.0000	2.0000	30.0000
606.0000	80.0000	148.0000	1836.0000				
148.0000	-0.0000	285936.0000	1.9950	-0.0000			-0

PRESSURE (PSIA)	DEPTH (FT)
606.0000000	0.0000000 5004
727.2000000	1300.98728078 6305
778.26353533	1836.00000000 6840

LOWER SECTION - 1.995" I.D.

UPPER TUBING  
6000 CF/88L

PRESSURE GRADIENT CALCULATION  
VERTICAL GAS/LIQUID FLOW

4-Case No. 43.5000° API .7000 S.G. Sep. Gas .9000 S.G. Tr. Vap. 150.0000° F B.P. 2700.0000 P<sub>HP</sub> 25.0000 P<sub>sep</sub> 1.4000 B<sub>g</sub>  
6000.0000 c.L./bbl 43.5000 .7000 .9000 25.0000 P<sub>sep</sub> 1.0000 S.G. 2.0000 C<sub>p</sub> 30.0000 Surf. Temp.  
250.0000 FTP 80.0000° F Tubg. 148.0000° F BH 5004.0000' Depth 100° F & Dyn. Visc.  
148.0000 BPD -0.0000 888000.0000 c/d 1.6700" I.D. Tubg. -0.0000" O.D. Tubg. 14.7 p.sia = 0  
or Csg.

PRESSURE (PSIA)	DEPTH (FT)
250.0000000	0.0000000
300.0000000	807.47940295
360.0000000	1909.99478122
432.0000000	3254.56102800
518.4000000	4764.74475707
533.30432996	5004.00000000

UPPER SECTION - 1.67" I.D.

204	43.5000	.7000	.9000	150.0000	2700.0000	25.0000	1.4000
6000.0000	43.5000	.7000	.9000	25.0000	1.0000	2.0000	30.0000
533.0000	80.0000	148.0000	1836.0000				
148.0000	-0.0000	888000.0000	1.0490	-0.0000			= 0

PRESSURE (PSIA)	DEPTH (FT)
533.0000000	0.0000000
639.6000000	681.28444951
767.9200000	1306.05880646
818.78458500	1836.00000000

LOWER SECTION - 1.67" I.D.

4	43.5000	.7000	.9000	150.0000	2700.0000	25.0000	1.4000
6000.0000	43.5000	.7000	.9000	25.0000	1.0000	2.0000	30.0000
533.0000	80.0000	148.0000	1836.0000				
148.0000	-0.0000	888000.0000	4.4080	2.8750			= 0

PRESSURE (PSIA)	DEPTH (FT)
533.0000000	0.0000000
639.6000000	951.30921071
742.34367981	1836.00000000

LOWER SECTION - 4.408" CSG. I.D.  
2.875" Tubg. O.D.

4	43.5000	.7000	.9000	150.0000	2700.0000	25.0000	1.4000
6000.0000	43.5000	.7000	.9000	25.0000	1.0000	2.0000	30.0000
533.0000	80.0000	148.0000	1836.0000				
148.0000	-0.0000	888000.0000	1.9950	-0.0000			= 0

PRESSURE (PSIA)	DEPTH (FT)
533.0000000	0.0000000
639.6000000	1430.27745347
670.44153923	1836.00000000

LOWER SECTION - 1.995" I. D.

LOWER TUBING  
1313 CF/BBL

PRESSURE GRADIENT CALCULATION  
VERTICAL GAS/LIQUID FLOW

1- Case No. 41.7000° API .7000 S.G. Sep. Gas .9000 S.G. Vap. 150.0000° F @ B.P. 2700.0000 P<sub>sep</sub> 25.0000 P<sub>sep</sub> 1.4000 = B<sub>0</sub>  
1313.0000 c.f./bbl 41.7000 .7000 .9000 25.0000 P<sub>sep</sub> 1.0000 S.G. 2.0000 30.0000 = Surf. Tens.  
570.0000 FTP 80.0000° F Tubg. 148.0000° F BH 5004.0000' Depth 100° F & 14.7 psi  
211.0000 BPD -0.0000 277043.0000 cf/d 2.4410" I.D. Tubg. -0.0000 "O.D. Tubg. or Csg.

PRESSURE (PSIA) DEPTH (FT)

500.00000000 0.00000000  
600.00000000 1114.07885044  
720.00000000 2365.37524093  
844.00000000 3700.10664959  
1036.80000000 4873.94403708

1061.29350923 5004.00000000

UPPER SECTION - 2.441" I.D.

201 41.7000 .7000 .9000 150.0000 2700.0000 25.0000 1.4000  
1313.0000 41.7000 .7000 .9000 25.0000 1.0000 2.0000 30.0000  
1061.0000 80.0000 148.0000 2135.0000  
211.0000 -0.0000 277043.0000 1.9950 -0.0000 \*0

PRESSURE (PSIA) DEPTH (FT)

1061.00000000 0.00000000 5004  
1273.20000000 1038.39797478 6042

1912.13698370 2135.00000000 7139

LOWER SECTION - 1.995" I.D.

1 41.7000 .7000 .9000 150.0000 2700.0000 25.0000 1.4000  
1313.0000 41.7000 .7000 .9000 25.0000 1.0000 2.0000 30.0000  
1061.0000 80.0000 148.0000 2135.0000  
211.0000 -0.0000 277043.0000 2.4410 -0.0000 \*0

PRESSURE (PSIA) DEPTH (FT)

1061.00000000 0.00000000 5004  
1273.20000000 980.41649376 5984  
1527.84000000 2088.70207888 7093

1538.97407457 2135.00000000 7139

LOWER SECTION - 2.441" I.D.

LOWER TUBING  
6000 CF/BBL.

PRESSURE GRADIENT CALCULATION  
VERTICAL GAS/LIQUID FLOW

3<sup>rd</sup> Case No. 41.7000° API .7000 S.G. Sep. Gas .9000 S.G. Tr. Vap. 150.0000° F @ B.P. 2700.0000 P<sub>sp</sub> 25.0000 P<sub>ann</sub> 1.4000 B<sub>0</sub>  
6000.0000 c/d/bbl 41.7000 .7000 .9000 25.0000 P<sub>ann</sub> 1.0000 S.G. 2.0000 μ<sub>sp</sub>-Cp. 30.0000 μ<sub>sp</sub> Surf. Tens.  
500.0000 FTP 80.0000° F Tubg. 148.0000° F BH 5004.0000 Depth 100° F & Dynes/cm  
211.0000 BPD -0.0000 1266000.0000 c/d 2.4410" I.D. Tubg. -0.0000" O.D. Tubg. 14.7 psia -0

PRESSURE (PSIA) DEPTH (FT)

500.00000000 0.00000000  
600.00000000 1387.85133539  
720.00000000 2894.09167295  
864.00000000 4530.25533550

905.92413256 5004.00000000

UPPER SECTION - 2.441" I.D.

203 41.7000 .7000 .9000 150.0000 2700.0000 25.0000 1.4000  
6000.0000 41.7000 .7000 .9000 25.0000 1.0000 2.0000 30.0000  
910.0000 80.0000 148.0000 2135.0000  
211.0000 -0.0000 1266000.0000 1.9950 -0.0000 -0

PRESSURE (PSIA) DEPTH (FT)

910.00000000 0.00000000  
1092.00000000 1636.40773805 6580

1148.56554924 2135.00000000 7139

LOWER SECTION - 1.995" I.D.

5 41.7000 .7000 .9000 150.0000 2700.0000 25.0000 1.4000  
6000.0000 41.7000 .7000 .9000 25.0000 1.0000 2.0000 30.0000  
910.0000 80.0000 148.0000 2135.0000  
211.0000 -0.0000 1266000.0000 2.4410 -0.0000 -0

PRESSURE (PSIA) DEPTH (FT)

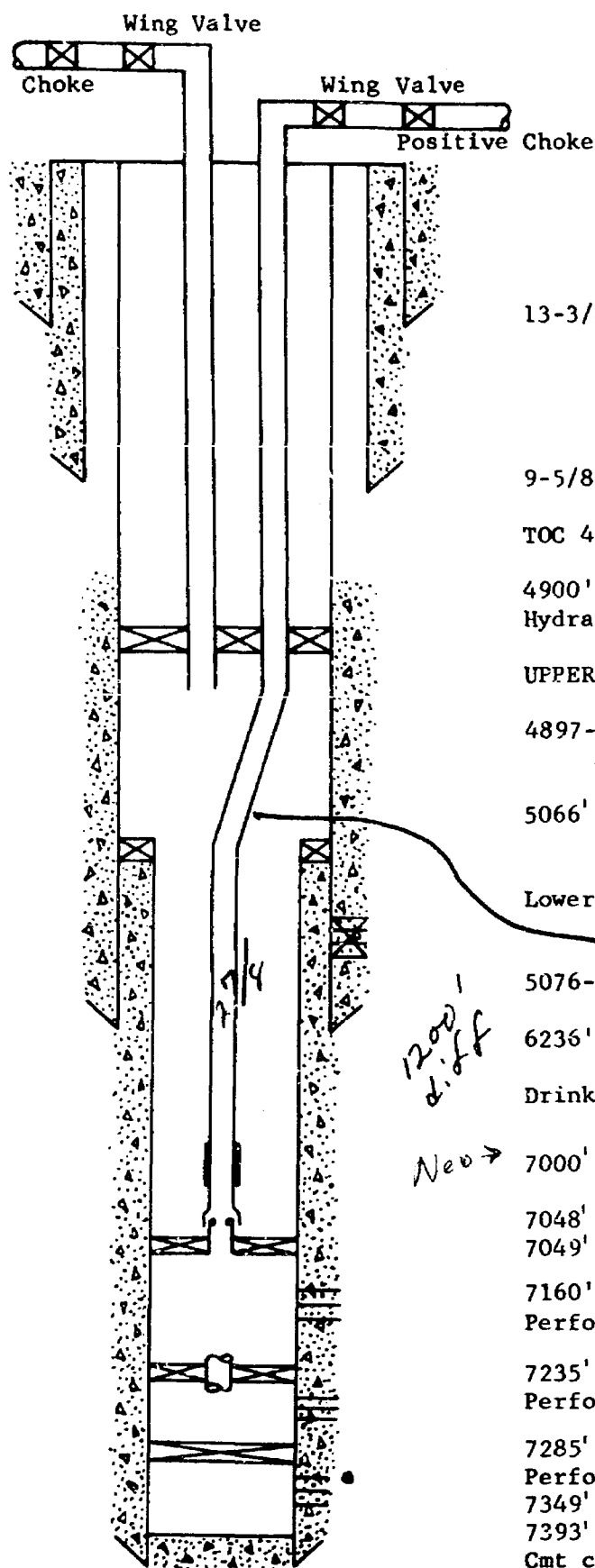
910.00000000 0.00000000  
1092.00000000 1575.66748538 6580

1158.09373479 2135.00000000 7139

LOWER SECTION - 2.441" I.D.

PROPOSED COMPLETION  
DIAGRAMMATIC SKETCH

SUN OIL COMPANY  
WALTER LYNCH 3 M  
SEC. 1, T-22-S, R-37-E  
Lea County, New Mexico



13-3/8", 40# @ 336' w/350 sx.

9-5/8", 36# @ 854' w/2200 sx.

TOC 4100' Calculated

4900' Tentative 7" x 2-1/2" x 1-1/2" Otis 23 RDH  
Hydraulic Packer

UPPER TUBING, PROPOSED; 0-4897 2" OD 3.4#/ft. J-55  
Buttress

4897-4911' 1-1/2" (1.660 OD), J-55 2.33#/ft. Intergal  
Joint

5066' Top of 5" Liner - TIW Type J Hanger & Type L  
Packer

Lower Tubing: 0-7048' 2-7/8" OD, 6.4#/ft. J-55 EUE  
8 RD

5076-5180' Paddock Perforations Squeezed w/200 sx.

6236' Top of Drinkard Zone

Drinkard Perforations. Tentative 6242-6859'

Neo → 7000' Otis Sliding Side-Door

7048' Otis Tubing Seal Divider W/N Profile

7049' Otis Perma Latch Packer & Tubing Seat

7160' Top of Wantz Granite Wash zone  
Perforations 7165-7219'

7235' Otis W/B Packer  
Perforations 7250-7270'

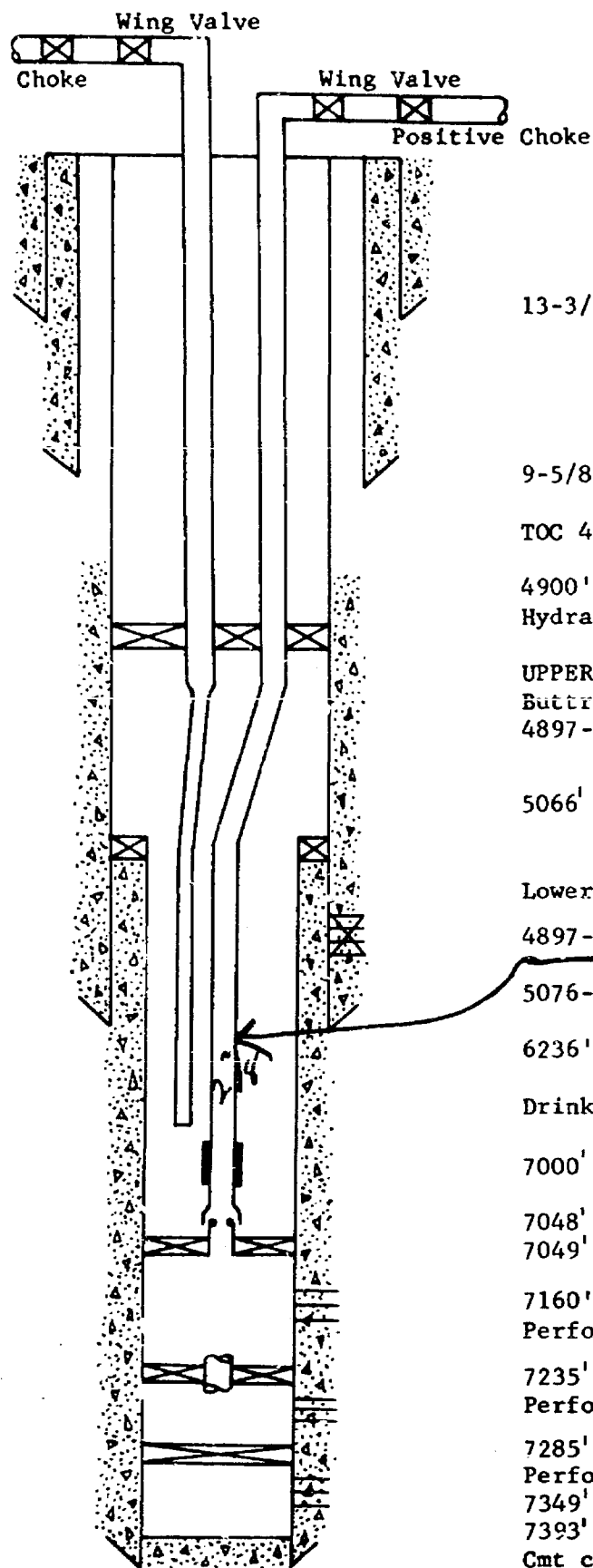
7285' Halliburton EZ Drill Bridge Plug 7  
Perforations 7290-7308'

7349' PBD

7393' Liner Seat 5", 15#, J-55, cmt'd w/200 sx  
Cmt circulated around packer at 5066'  
TD 7394'

PROPOSED COMPLETION  
DIAGRAMMATIC SKETCH  
(ALTERNATE NO. 1)

SUN OIL COMPANY  
WALTER LYNCH 3 M  
SEC. 1, T-22-S, R-37-E  
Lea County, New Mexico



13-3/8", 40# @ 336' w/350 sx.

9-5/8", 36# @ 854' w/2200 sx.

TOC 4100' Calculated

4900' Tentative 7" x 2-1/2" x 1-1/2" Otis 23 RDH Hydraulic Packer

UPPER TUBING, PROPOSED; 0-4897 2" OD 3.4#/ft. J-55 Buttress  
4897-6200' 1" (1.315 OD) CS Hydril Tbg 1.8#/ft.

5066' Top of 5" Liner - TIW Type J Hanger & Type L Packer

Lower Tubing: 0-4897' 2-7/8" OD 6.4#/ft., J EUE  
4897-7048' 2-3/8" OD 4.6#/ft., J NU

5076-5180' Paddock Perforations Squeezed w/200 sx.

6236' Top of Drinkard Zone

Drinkard Perforations. Tentative 6242-6859'

7000' Otis Sliding Side-Door

7048' Otis Tubing Seal Divider W/N Profile  
7049' Otis Perma Latch Packer & Tubing Seat

7160' Top of Wantz Granite Wash zone  
Perforations 7165-7219'

7235' Otis W/B Packer  
Perforations 7250-7270'

7285' Halliburton EZ Drill Bridge Plug 7  
Perforations 7290-7308'

7349' PBD

7393' Liner Seat 5", 15#, J-55, cmt'd w/200 sx  
Cmt circulated around packer at 5066'  
TD 7394'



(Case 5389 continued from Page 3)

Range 37 East, Tubb Gas Pool, Lea County, New Mexico, to be dedicated to a well to be dually completed at a standard location in Unit F of said Section 3.

CASE 5390: Application of El Paso Natural Gas Company for extension of Order No. R-4342, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks the extension of the provisions of Order No. R-4342, which order authorized the applicant to produce certain non-marginal wells in the San Juan 32-9 Unit Area, Blanco-Mesaverde Pool, San Juan County, New Mexico, at full capacity while conducting tests, making up such overproduction by underproducing other non-marginal wells within the participating area.

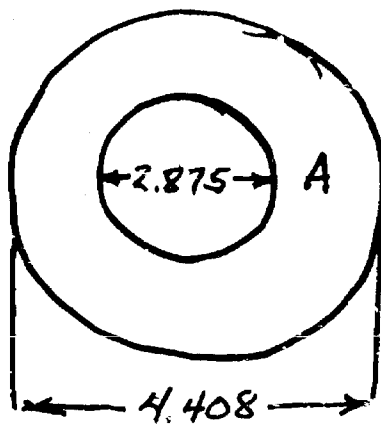
CASE 5391: Application of David Fasken for downhole commingling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of Boyd-Cisco and Boyd Morrow production in the wellbore of its Arco 9 Morrison Well No. 1, located in Unit B of Section 9, Township 19 South, Range 25 East, Eddy County, New Mexico.

CASE 5392: Application of David Fasken for an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of a gas well to be drilled in the NE/4 of Section 2, Township 18 South, Range 26 East, Atoka-Pennsylvanian Gas Pool, Eddy County, New Mexico, at a point 1980 feet from the North line and 660 feet from the East line of said Section 2, the N/2 of the Section to be dedicated to the well.

CASE 5393: Application of Getty Oil Company for downhole commingling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of Blinebry, Tubb-Drinkard, and Montoya production in the wellbore of its Coates "C" Well No. 14, located in Unit G of Section 24, Township 25 South, Range 37 East, Justis Field, Lea County, New Mexico.

CASE 5394: Application of Dugan Production Corporation for amendment of special pool rules, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks the amendment of Rule 2 of the Special Rules and Regulations for the Slick Rock-Dakota Oil Pool, San Juan County, New Mexico, to allow the drilling of wells to within 25 feet of quarter-quarter section lines when the offset acreage is owned by the party drilling the well.

CASE 5395: Application of Sun Oil Company for two dual completions and two tubing exceptions, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the dual completion of its Lynch Wells Nos. 1 and 3, located in Units K and M, respectively, of Section 1, Township 22 South, Range 37 East, Lea County, New Mexico, to produce oil from the Drinkard and Wantz-Granite Wash Pools through parallel strings of tubing. Applicant further seeks approval to utilize 1.315" O.D. tubing for the lower 1800 feet of its Drinkard production string in said Well No. 1, and for the lower 1303 feet of its Drinkard production string in said Well No. 3, *to be allowed to produce oil from the Drinkard Pool through 2 inch I.D. tubing suspended 1800 feet and 1303 feet respectively, from the bottom of the production*



$$A = 8.77$$

Circular area of 8.77 would  
be a pipe w/ an ID of 3.3412  
walls of which would have  
an inside circumference of  
9.87"

$$\begin{aligned} &\text{walls of the space A have an} \\ &\text{circumference of } \pi \cdot 2.875 \\ &+ \pi \cdot 4.408 = \begin{matrix} 9.03 \\ 13.85 \end{matrix} = 22.88 \end{aligned}$$

JASON W. KELLAHIN  
ROBERT E. FOX  
W. THOMAS KELLAHIN

KELLAHIN AND FOX  
ATTORNEYS AT LAW  
500 DON GASPAR AVENUE  
POST OFFICE BOX 1769  
SANTA FE, NEW MEXICO 87501

TELEPHONE 982-4315  
AREA CODE 505

January 24, 1975

Mr. Richard Staments  
New Mexico Oil Conservation Commission  
P. O. Box 2008  
Santa Fe, New Mexico 87501

Re: Sun Oil Company  
Application for Downhole  
Commingling, Lea County,  
New Mexico; OCC No. 5393  
Heard January 8, 1975

Dear Mr. Staments:

In connection with the hearing of the above referenced application, certain questions were asked of Sun Oil Company's witness, Mr. Herb Seidel, for which he did not have a complete answer at the time.

Please find enclosed for your consideration an additional statement by Mr. Seidel which regards to those questions.

Very truly yours,

  
W. Thomas Kellahin

WTK:ks

Enclosure

cc: Mr. H. R. Huey

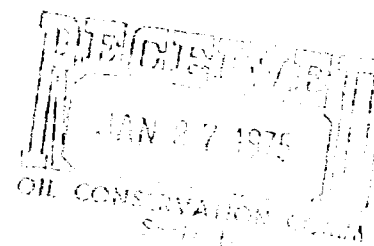
SUBJECT: DRINKARD AND GRANITE WASH POOLS HEARING  
LEA COUNTY, NEW MEXICO

DATE: January 21, 1975

OFFICE: Dallas Region

FROM: Herb A. Seidel, Jr.

TO: Mr. H. R. Huey



As a follow-up to my testimony on the subject pools, I believe additional comment is of interest which could be filed with the Conservation Commission as a closing statement if you so desire.

I had no calculations at the time and it was necessary to estimate two values on cross examination by the examiner -- (1) the oil recovery lost in the Drinkard completion by using the 1" tubing rather than casing-tubing annulus and (2) the oil recovery lost in the Granite Wash completion by using the 2" rather than 2½" tubing to pump below a packer. I testified that the estimated losses would be as shown below with a comparison to that calculated subsequent to the hearing:

	Estimated Loss - M Bbls.	Calculated		Loss - M Bbls.
		M Bbls. @ Pw	M Bbls. @ Pw	
(1) Drinkard	-0-	37 @ 823#	41 @ 753#	4
(2) Gran. W.	10	95 @ 473#	111 @ 313#	16
Total	10	132	152	20

Pw represents the formation flowing pressure. The Drinkard completion calculations are for a 6000 c.f./bbl. GOR. The Drinkard is historically a high-GOR producer, ranging above 25,000 c.f./bbl. If the GOR for this completion should reach this higher level, the recovery would be increased and the loss decreased from that tabled above. In any event, the ultimate recovery gain by the well should be enhanced some 15,000 - 20,000 bbls. using the preferred completion method proposed by Sun as opposed to Alternate No. 1.

I also testified from Exhibit No. 4 that the 1.995" I.D. tubing for the lower tubing was more efficient than the 2.441" I.D. since the smaller tubing had a lower calculated BHFP, comparing calculated results for the different tubular systems at either a GOR of 1313 c.f./bbl. or 6000 c.f./bbl. The examiner questioned me as to whether the 6000 c.f./bbl. GOR was more efficient than the 1313 c.f./bbl. GOR, using the same rationale of the lower calculated BHFP. I answered that it was more efficient, in error. The efficiency can only be compared (correctly) using the same GOR because the head for each tubular system would be very nearly the same and the pressure difference observed would be due entirely to frictional pressure drop, which is inversely proportional to flow efficiency.

*Herb A. Seidel, Jr.*  
Herb A. Seidel, Jr.

HAS/eev  
cc: See attached sheet

Pom K will file application  
for new hearing using  
method #2

Case 5295  
5295

WALTER LYNCH NO. 1

#1 To comply with the New Mexico Conservation Commission's concern in maximizing recovery from the upper tubing (Drinkard) zone as currently completed, Sun Oil Company proposes that a sliding side-door be installed in the lower tubing at approximately 7000'. This will permit access to the upper tubing zone at a point well below the upper zone and thus a method of effectively unloading any fluids that may accumulate in the annulus.

#2 Failing to obtain approval to produce this well as proposed above with upper tubing point at 5014' (846' above the Drinkard perforations) and sliding side-door in lower tubing, Sun requests that the New Mexico Conservation Commission permit an alternate completion proposal to extend the tubing point from 5000' to 6800' (40' above the Drinkard perforations) using 1" (1.315 OD) tubing. Required for the lower tubing string will be a reduction in tubing size (below the upper packer at 5004') from 2-7/8" OD EUE to 2-3/8" OD NU. A further reduction of the more important lower zone (Granite Wash) tubing size below 2-3/8" OD NU would create a severe problem at a time when this zone will require artificial lift. Pumping free gas below a packer is relatively inefficient and the larger pump will provide higher producing rates and tend to maximize primary recovery. The characteristic high GOR production anticipated from the Drinkard is expected to permit maximum primary recovery without the need for artificial lift.

WALTER LYNCH NO. 3

Failing to obtain approval of a type completion similar to the proposed completion in the Walter Lynch No. 1, Sun requests that the New Mexico Conservation Commission permit a type completion similar to the Walter Lynch No. 1's alternate described above.

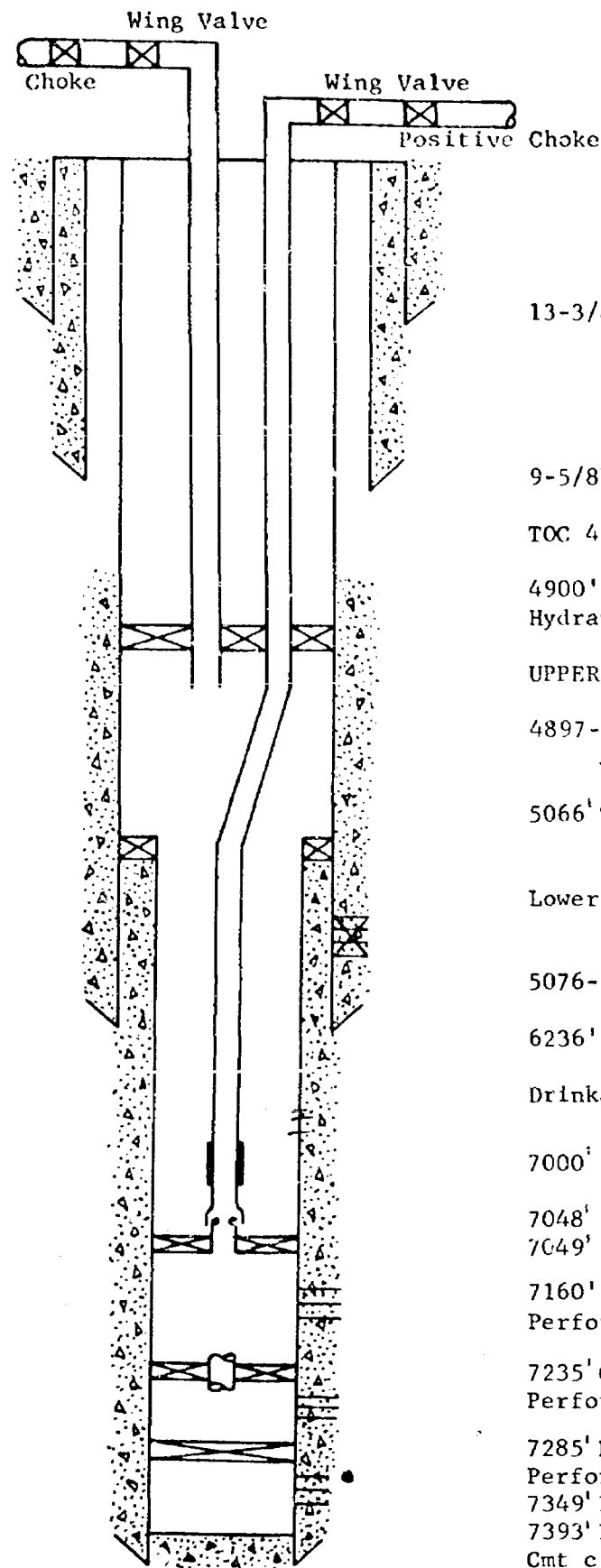
DOCKET MAILED

Date 12-26-74

Case 5395

PROPOSED COMPLETION  
DIAGRAMMATIC SKETCH

SUN OIL COMPANY  
WALTER LYNCH 3 M  
SEC. 1, T-22-S, R-37-E  
Lea County, New Mexico



13-3/8", 40# @ 336' w/350 sx.

9-5/8", 36# @ 854' w/2200 sx.

TOC 4100' Calculated

4900' Tentative 7" x 2-1/2" x 1-1/2" Otis 23 RDH  
Hydraulic Packer

UPPER TUBING, PROPOSED; 0-4897 2" OD 3.4#/ft. J-55  
Buttress

4897-4911' 1-1/2" (1.660 OD), J-55 2.33#/ft. Intergal  
Joint

5066' Top of 5" Liner - TIW Type J Hanger & Type L  
Packer

Lower Tubing: 0-7048' 2-7/8" OD, 6.4#/ft. J-55 EUE  
8 RD

5076-5180' Paddock Perforations Squeezed w/200 sx.

6236' Top of Drinkard Zone

Drinkard Perforations. Tentative 6242-6859'

7000' Otis Sliding Side-Door

7048' Otis Tubing Seal Divider W/N Profile  
7049' Otis Perma Latch Packer & Tubing Seat

7160' Top of Wantz Granite Wash zone  
Perforations 7165-7219'

7235' Otis W/B Packer  
Perforations 7250-7270'

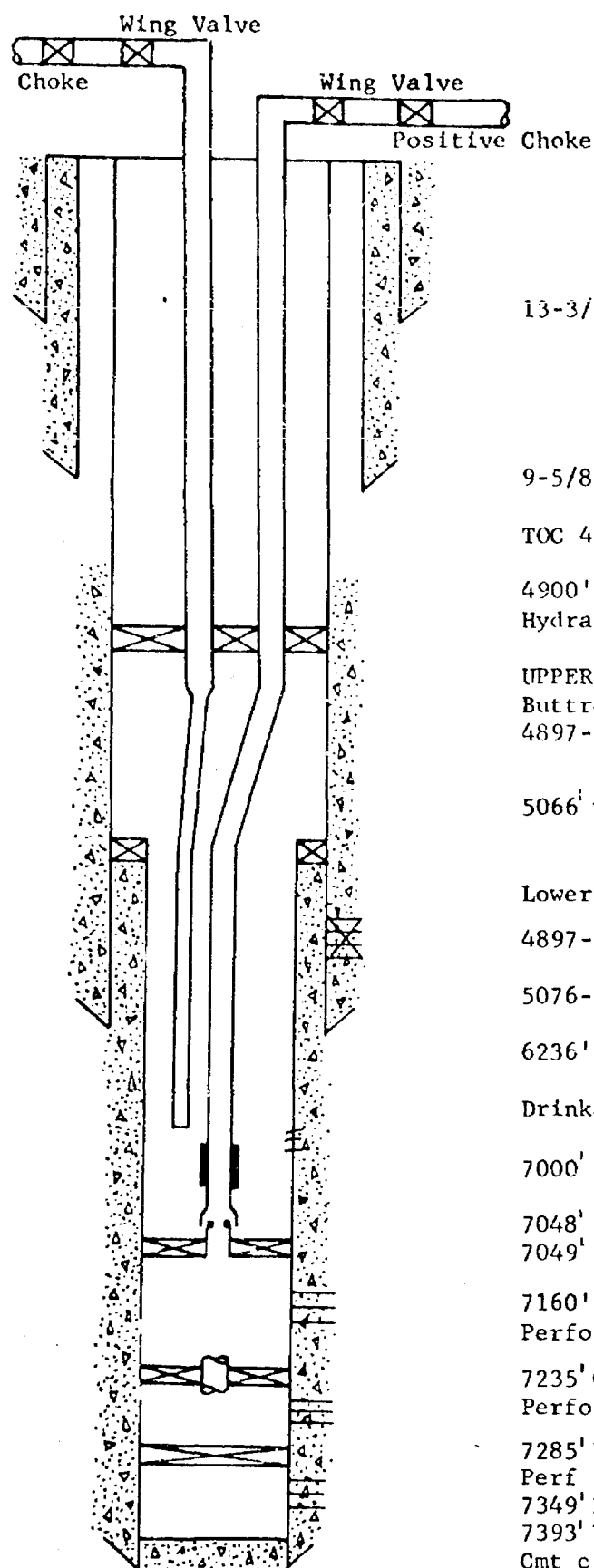
7285' Halliburton EZ Drill Bridge Plug 7  
Perforations 7290-7308'

7349' PBTB

7393' Liner Seat 5", 15#, J-55, cmt'd w/200 sx  
Cmt circulated around packer at 5066'  
TD 7394'

PROPOSED COMPLETION  
 DIAGRAMMATIC SKETCH  
 (ALTERNATE NO. 1)

SUN OIL COMPANY  
 WALTER LYNCH 3 M  
 SEC. 1, T-22-S, R-37-E  
 Lea County, New Mexico



13-3/8", 40# @ 336' w/350 sx.

9-5/8", 36# @ 854' w/2200 sx.

TOC 4100' Calculated

4900' Tentative 7" x 2-1/2" x 1-1/2" Otis 23 RDH  
 Hydraulic Packer

UPPER TUBING, PROPOSED; 0-4897 2" OD 3.4#/ft. J-55  
 Buttress

4897-6200' 1" (1.315 OD) CS Hydril Tbg 1.8#/ft.

5066' Top of 5" Liner - TIW Type J Hanger & Type L  
 Packer

Lower Tubing: 0-4897' 2-7/8" OD 6.4#/ft., J FUE

4897-7048' 2-3/8" OD 4.6#/ft., J NU

5076-5180' Paddock Perforations Squeezed w/200 sx.

6236' Top of Drinkard Zone

Drinkard Perforations. Tentative 6242-6859'

7000' Otis Sliding Side-Door

7048' Otis Tubing Seal Divider W/N Profile

7049' Otis Perma Latch Packer & Tubing Seat

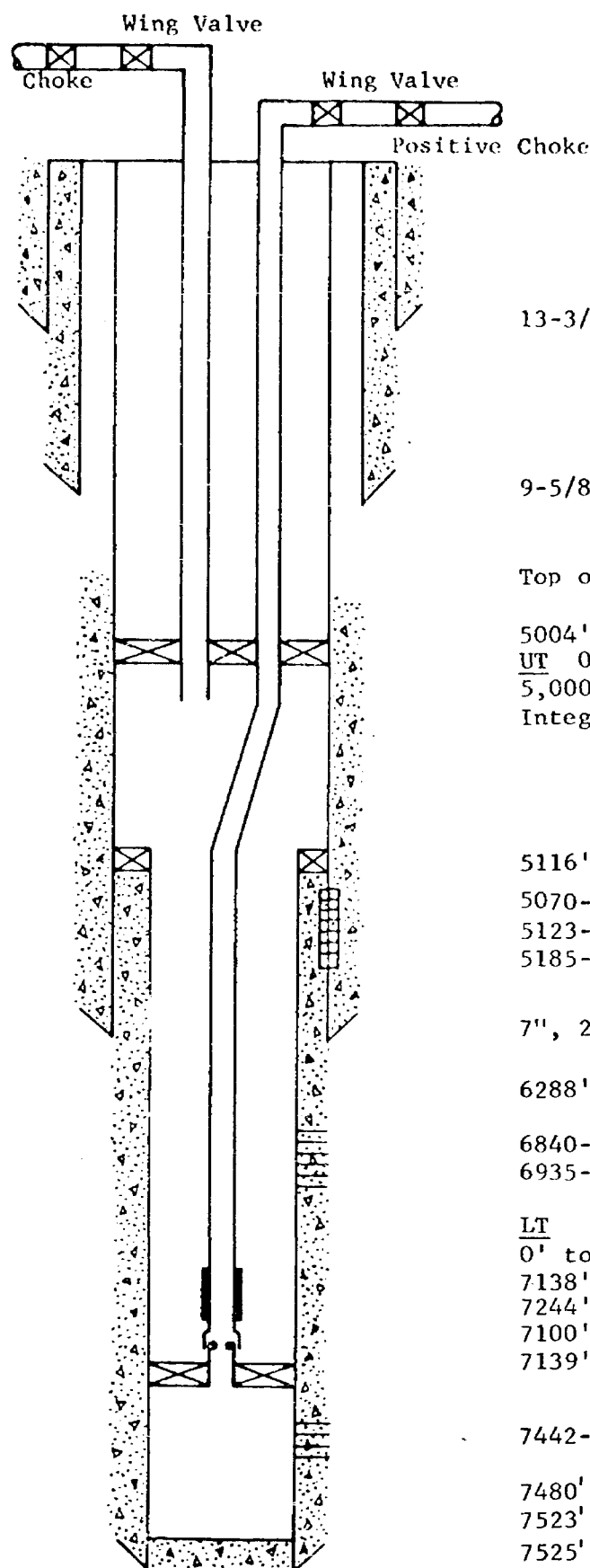
7160' Top of Wantz Granite Wash zone  
 Perforations 7165-7219'

7235' Otis W/B Packer  
 Perforations 7250-7270'

7285' Halliburton EZ Drill Bridge Plug 7  
 Perforations 7290-7308'

7349' PBTB

7393' Liner Seat 5", 15#, J-55, cmt'd w/200 sx  
 Cmt circulated around packer at 5066'  
 TD 7394'

PROPOSED COMPLETION  
DIAGRAMMATIC SKETCHSUN OIL COMPANY  
WALTER LYNCH NO. 1 K  
SEC. 1, T-22-S, R-37-E

13-3/8", 40# @ 326' w/350 sx.

9-5/8", 36# @ 2848' w/2500 sx.

Top of Cement 3700'

5004' 7" x 2-1/2" x 1-1/2" Otis 23 RDH Hyd. Packer  
 UT 0' to 5000' 2" OD 3.4#, J-55 Butress Thread Tbg.  
 5,000' to 5014 (through packer) 1-1/2" (1.660" OD)  
 Integral Joint, 5010' Otis "N" Nipple.

5116' TIW Type J Hanger &amp; Type L Packer

5070-5090' } Paddock Perforations  
 5123-5146' } Squeezed w/200 sx.  
 5185-5215' }

7", 23# @ 5255' w/350 sx

6288' Top of Drinkard Zone

6840-6906' }  
 6935-6956' } Drinkard Perfs

LT

0' to 7138' 2-7/8" OD EUE 8 RD J-55 6.5#/ft. Tbg  
 7138' Otis 2-3/8" Seal Divider w/"N" Receptacle  
 7244' Top of Wantz Granite Wash zone  
 7100' Otis Sliding Side-Door  
 7139' 5" x 2-3/8" Otis Perma Latch Packer

7442-44' Wantz Granite Wash Perfs

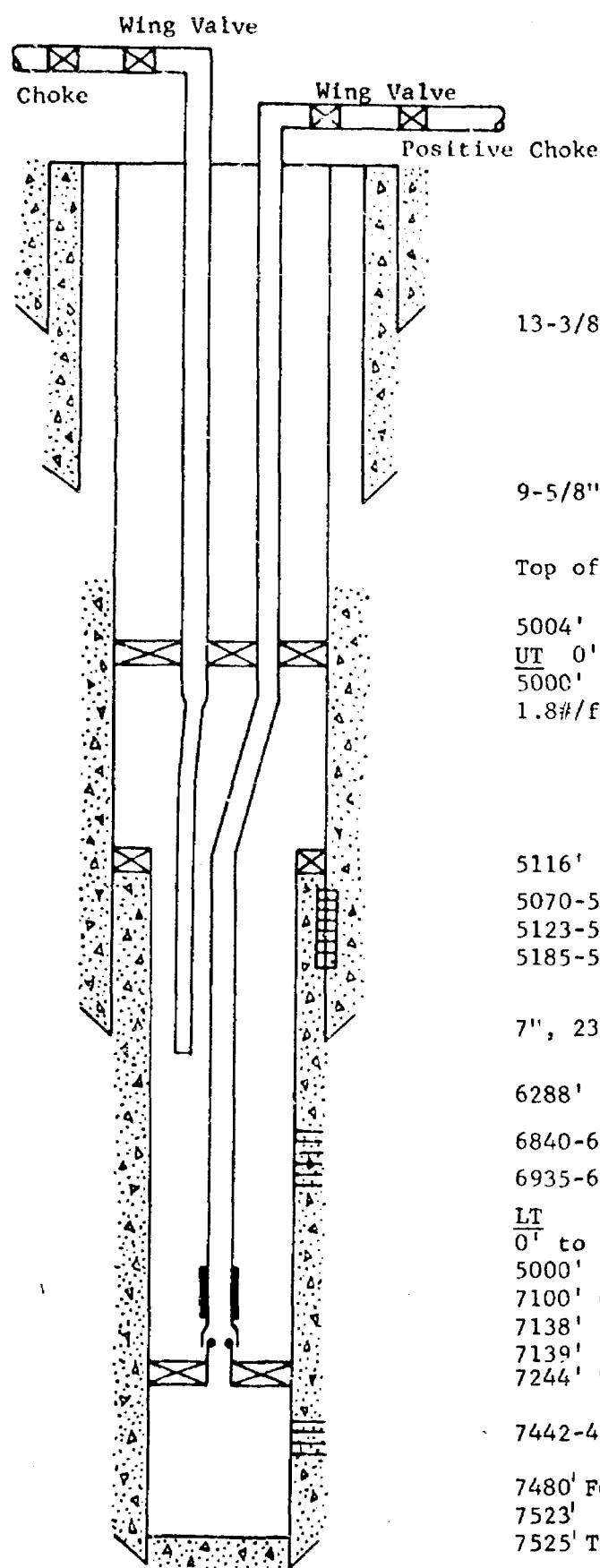
7480' FC and PBTD

7523' 5", 15# w/200 sx. Circ around pkr. @ 5116'.  
 7525' TD



PROPOSED COMPLETION  
 DIAGRAMMATIC SKETCH  
 (ALTERNATE NO. 1)

SUN OIL COMPANY  
 WALTER LYNCH NO. 1 K  
 SEC. 1, T-22-S, R-37-E



13-3/8", 40# @ 326' w/350 sx.

9-5/8", 36# @ 2848' w/2500 sx.

Top of Cement 3700'

5004' 7" x 2-1/2" x 1-1/2" Otis 23 RDH Hyd. Packer  
 UT 0' to 5000' 2" OD 3.4#, J-55 Butress Thread Tbg.  
 5000' to 6800' 1" (1.315 OD) CS Hydril Tbg.  
 1.8#/ft.

5116' TIW Type J Hanger & Type L Packer  
 5070-5090' } Paddock Perforations  
 5123-5146' } Squeezed w/200 sx.  
 5185-5215' }

7", 23# @ 5255' w/350 sx

6288' Top of Drinkard Zone

6840-6906' }  
 6935-6956' } Drinkard Perfs

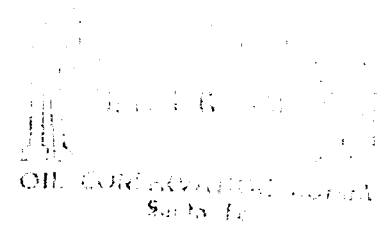
LT  
 0' to 5000' 2-7/8" OD EUE J-55 6.5#/ft. Tbg.  
 5000' to 7138' 2-3/8" OD NU, J-55 4.6#/ft. Tbg.  
 7100' Otis Sliding Side-Door  
 7138' Otis Seal Divider W/N Receptacle  
 7139' 5" x 2-3/8" Otis Perma Latch Pkr.  
 7244' Top of Wantz Granite Wash Zone

7442-44' Wantz Granite Wash Perfs

7480' FC and PBTB  
 7523' 5", 15# w/200 sx. Circ around pkr. @ 5116'.  
 7525' TD

BEFORE THE  
OIL CONSERVATION COMMISSION OF NEW MEXICO

IN THE MATTER OF THE APPLICATION  
OF SUN OIL COMPANY FOR APPROVAL  
OF A DUAL COMPLETION, LEA COUNTY,  
NEW MEXICO



A P P L I C A T I O N

COMES NOW Sun Oil Company and applies to the Oil Conservation Commission of New Mexico for approval of the dual completion of its Walter Lynch Wells Nos. 1 and 3, Lea County, New Mexico, and in support thereof would show the Commission:

1. The Lynch Well, No. 1, is located in Unit K, Section 1, Township 22 South, Range 37 East, N.M.P.M., and the Lynch Well No. 3 is located in Unit M, Section 1, Township 22 South, Range 37 East, N.M.P.M.

2. Both wells are completed in the Drinkard formation and the Wantz Granite Wash Pool.

3. Applicant proposes to complete the wells as follows:

(1) Alternative #1:

To comply with the New Mexico Conservation Commission's concern in maximizing recovery from the upper tubing (Drinkard) zone as currently completed, Sun Oil Company proposes that a sliding side-door be installed in the lower tubing at

**DOCKET MARKS**

**Don**

approximately 7000' as set forth on attachments 1 and 2 incorporated herein by reference. This will permit access to the upper tubing zone at a point well below the upper zone and thus a method of effectively unloading any fluids that may accumulate in the annulus.

(2) Alternative #2:

In the event the first proposal set forth above is unsatisfactory, applicant proposes to extend the tubing point from 5000' to 6800' (40' above the Drinkard perforations) using 1" (1.315 OD) tubing as set forth on attachments 3 and 4 incorporated herein by reference.

Required for the lower tubing string will be a reduction in tubing size (below the upper packer at 5004') from 2-7/8" OD EUE to 2-3/8" OD NU.

A further reduction of the more important lower zone (Granite Wash) tubing size below 2-3/8" OD NU would create a severe problem at a time when this zone will require artificial lift. Pumping free gas below a packer is relatively inefficient and the larger pump will provide higher producing rates and tend to maximize primary recovery. The characteristic high GOR production anticipated from the Drinkard is expected to permit maximum primary recovery without the need for artificial lift.

4. The completion of the Lynch Wells Nos. 1 and 3 in the manner proposed is in the interest of conservation, and will result in the production of oil and gas that would not otherwise be recovered and waste will not occur.

WHEREFORE, applicant prays that this application be set for hearing before the Oil Conservation Commission at the earliest convenient date, and that after notice and hearing as required by law, the Commission enter its order approving the completion of the two wells as proposed.

Respectfully submitted,

SUN OIL COMPANY

BY

  
KELLAHIN & FOX

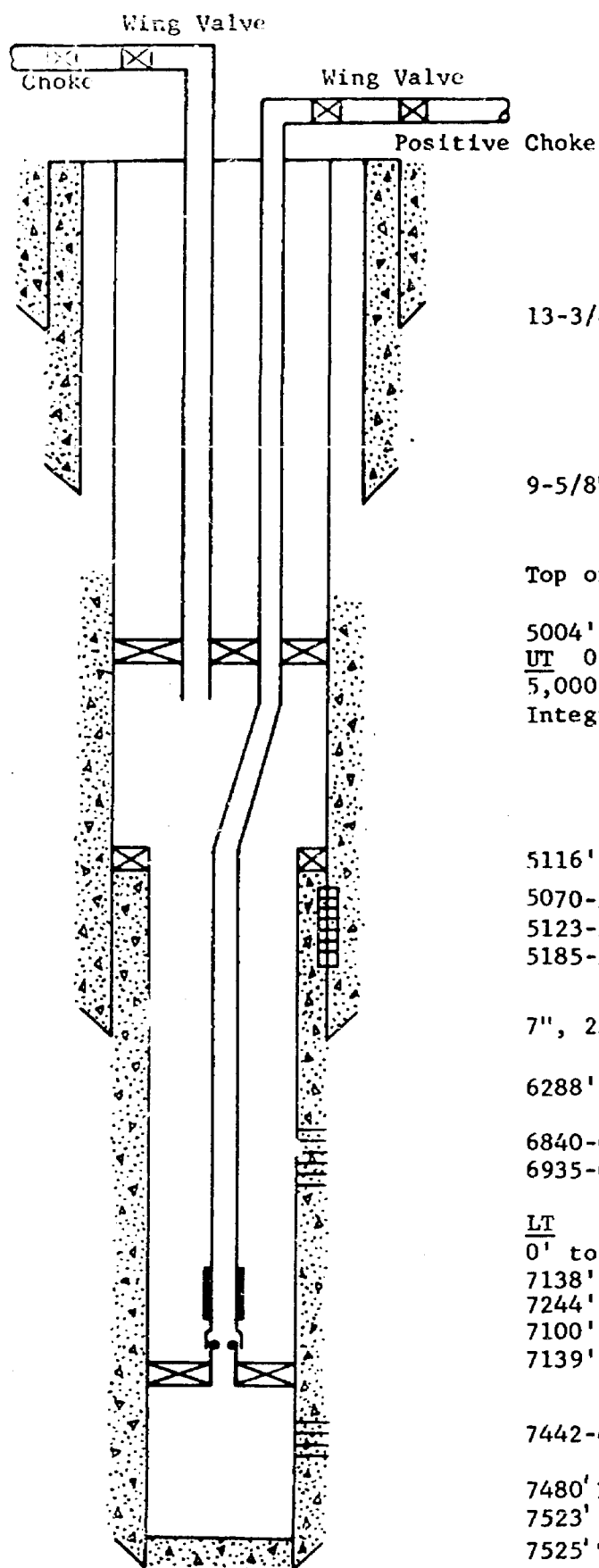
P. O. Box 1769

Santa Fe, New Mexico 87501

ATTORNEYS FOR APPLICANT

COMPLETION  
SCHEMATIC SKETCH

SEE OIL CO.  
WALTER LYNCH  
SEC. 1, T-22-N, R-1-E



13-3/8", 40# @ 326' w/350 sx.

9-5/8", 36# @ 2848' w/2500 sx.

Top of Cement 3700'

5004' 7" x 2-1/2" x 1-1/2" Otis 23 RDH Hyd. Packer  
UT 0' to 5000' 2" OD 3.4#, J-55 Butress Thread 1bg.  
5,000' to 5014 (through packer) 1-1/2" (1.660" OD)  
Integral Joint, 5010' Otis "N" Nipple.

5116' TIW Type J Hanger & Type L Packer

5070-5090' } Paddock Perforations  
5123-5146' } Squeezed w/200 sx.  
5185-5215' }

7", 23# @ 5255' w/350 sx

6288' Top of Drinkard Zone

6840-6906' } Drinkard Perfs  
6935-6956' }

LT

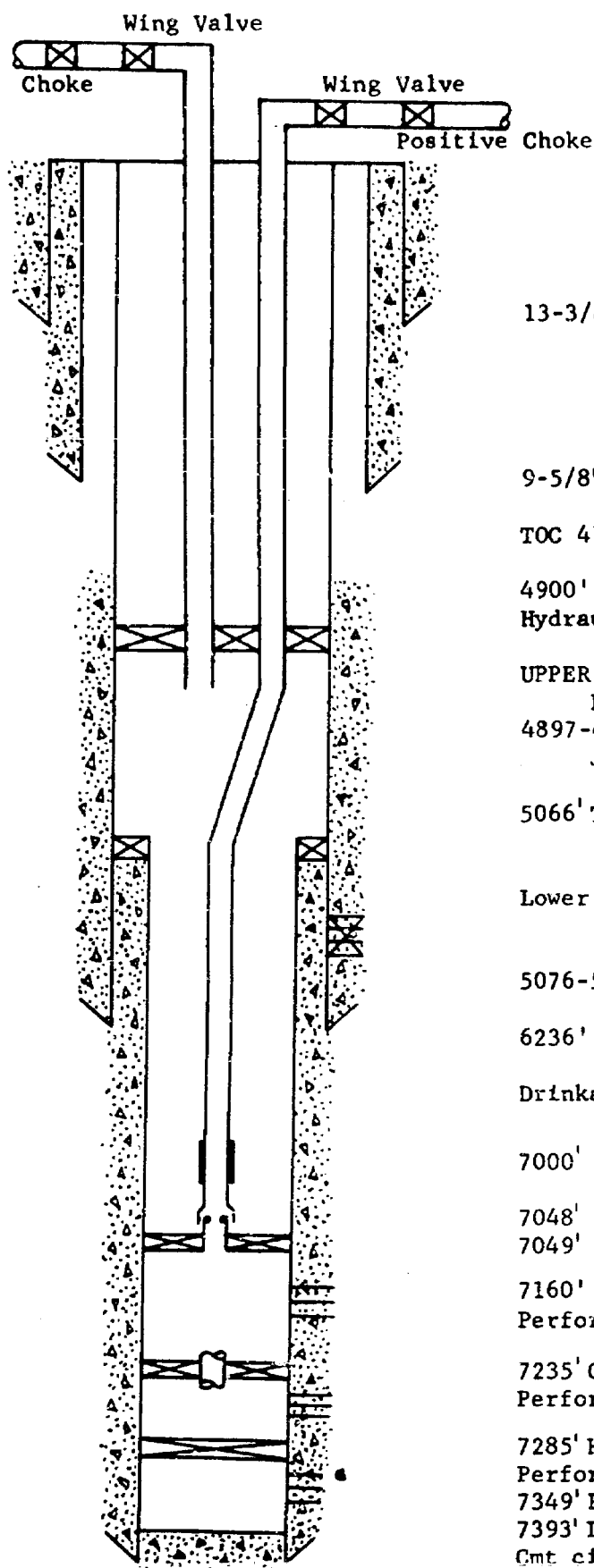
0' to 7138' 2-7/8" OD EUE 8 RD J-55 6.5#/ft. Tbg  
7138' Otis 2-3/8" Seal Divider w/"N" Receptacle  
7244' Top of Wantz Granite Wash zone  
7100' Otis Sliding Side-Door  
7139' 5" x 2-3/8" Otis Perma Latch Packer

7442-44' Wantz Granite Wash Perfs

7480' FC and PBD

7523' 5", 15# w/200 sx. Circ around pkr. @ 5116'.  
7525' TD

#1



13-3/8", 40# @ 336' w/350 sx.

9-5/8", 36# @ 854' w/2200 sx.

TOC 4100' Calculated

4900' Tentative 7" x 2-1/2" x 1-1/2" Otis 23 RDH  
Hydraulic Packer

UPPER TUBING, PROPOSED; 0-4897 2" OD 3.4#/ft. J-55  
Buttress

4897-4911' 1-1/2" (1.660 OD), J-55 2.33#/ft. Intergal  
Joint

5066' Top of 5" Liner - TIW Type J Hanger & Type L  
Packer

Lower Tubing: 0-7048' 2-7/8" OD, 6.4#/ft. J-55 EUE  
8 RD

5076-5180' Paddock Perforations Squeezed w/200 sx.

6236' Top of Drinkard Zone

Drinkard Perforations. Tentative 6242-6859'

7000' Otis Sliding Side-Door

7048' Otis Tubing Seal Divider W/N Profile

7049' Otis Perma Latch Packer & Tubing Seat

7160' Top of Wantz Granite Wash zone  
Perforations 7165-7219'

7235' Otis W/B Packer  
Perforations 7250-7270'

7285' Halliburton EZ Drill Bridge Plug 7  
Perforations 7290-7308'

7349' PBTB

7393' Liner Seat 5", 15#, J-55, cmt'd w/200 sx  
Cmt circulated around packer at 5066'

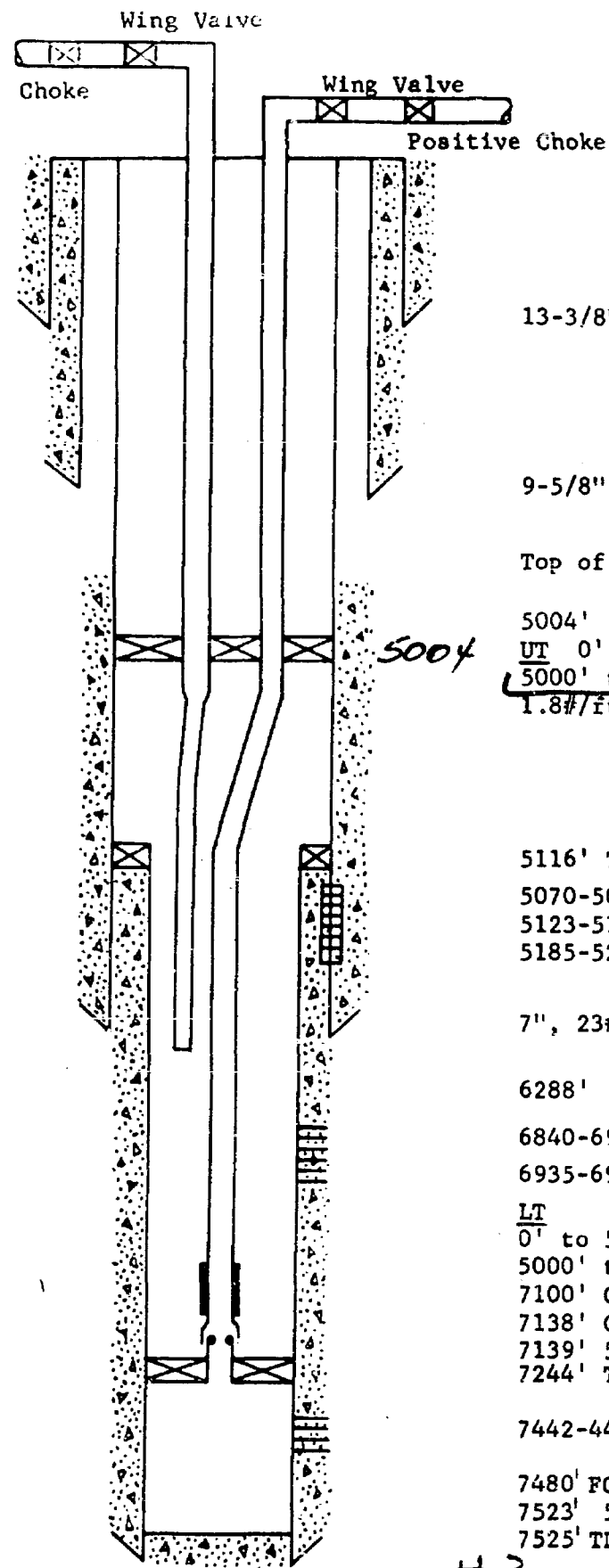
TD 7394'

#2

Case 5395

PROPOSED COMPLETION  
DIAGRAMMATIC SKETCH  
(ALTERNATE NO. 1)

COMPANY  
LYNCH NO. 1 K  
SEC. 1, T-22-S, R-37-E



13-3/8", 40# @ 326' w/350 sx.

9-5/8", 36# @ 2848' w/2500 sx.

Top of Cement 3700'

5004' 7" x 2-1/2" x 1-1/2" Otis 23 RDH Hyd. Packer  
UT 0' to 5000' 2" OD 3.4#, J-55 Butress Thread Tbg.  
5000' to 6800' 1" (1.315 OD) CS Hydril Tbg.  
1.8#/ft.

1800' 1"

5116' TIW Type J Hanger & Type L Packer  
5070-5090' } Paddock Perforations  
5123-5146' } Squeezed w/200 sx.  
5185-5215' }

7", 23# @ 5255' w/350 sx

6288' Top of Drinkard Zone

6840-6906' }  
6935-6956' } Drinkard Perfs

LT  
0' to 5000' 2-7/8" OD EUE J-55 6.5#/ft. Tbg.  
5000' to 7138' 2-3/8" OD NU, J-55 4.6#/ft. Tbg.  
7100' Otis Sliding Side-Door  
7138' Otis Seal Divider W/N Receptacle  
7139' 5" x 2-3/8" Otis Perma Latch Pkr.  
7244' Top of Wantz Granite Wash Zone

7442-44' Wantz Granite Wash Perfs

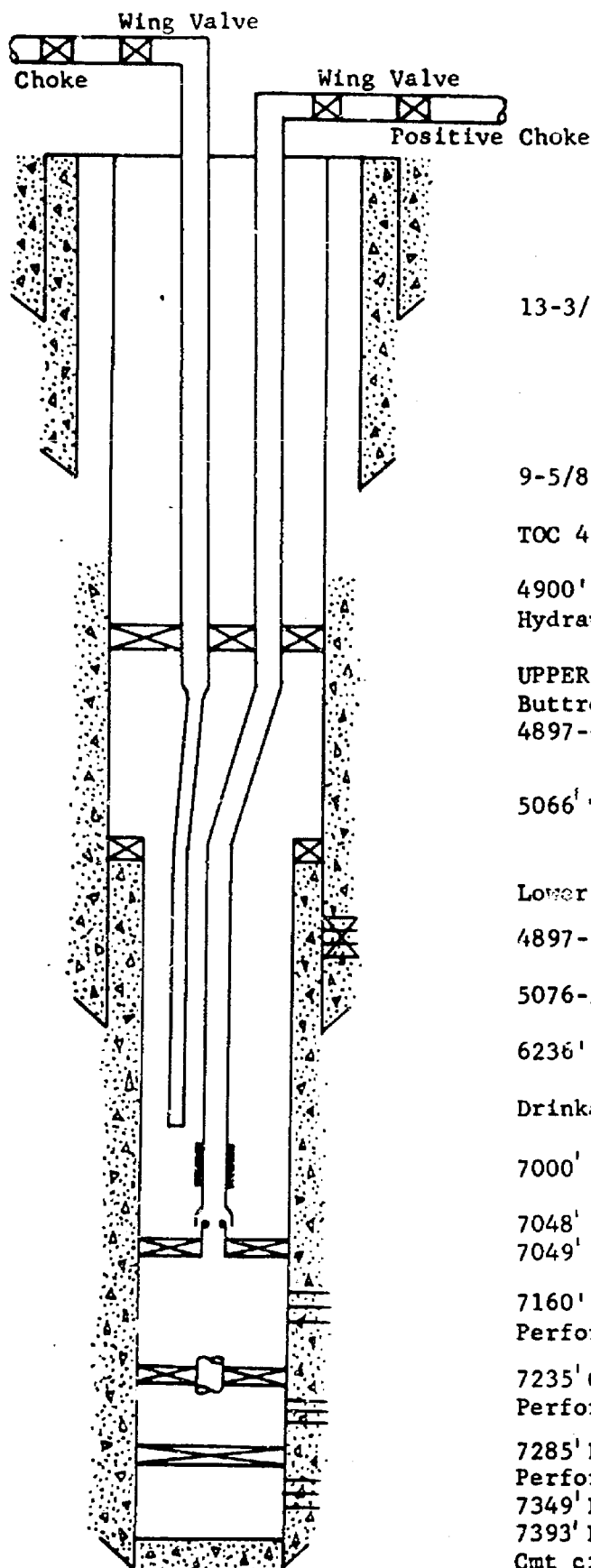
7480' FC and PBTB  
7523' 5", 15# w/200 sx. Circ around pkr. @ 5116'.  
7525' TD

#3

Case 5395

WELL COMPLETION  
DIAGRAMMATIC SKETCH  
(ALTERNATE NO. 1)

NEW OIL COMPANY  
WALTER LYNCH & SONS  
SEC. 1, T-22-S, R-37-E  
Lea County, New Mexico



6200  
4897  
-----  
1303' 1"

13-3/8", 40# @ 336' w/350 sx.

9-5/8", 36# @ 854' w/2200 sx.

TOC 4100' Calculated

4900' Tentative 7" x 2-1/2" x 1-1/2" Otis 23 RDH  
Hydraulic Packer

UPPER TUBING, PROPOSED; 0-4897 2" OD 3.4#/ft. J-55  
Buttress  
4897-6200' 1" (1.315 OD) CS Hydril Tbg 1.8#/ft.

5066' Top of 5" Liner - TIW Type J Hanger & Type L  
Packer

Lower Tubing: 0-4897' 2-7/8" OD 6.4#/ft., J EUE  
4897-7048' 2-3/8" OD 4.6#/ft., J NU

5076-5180' Paddock Perforations Squeezed w/200 sx.

6236' Top of Drinkard Zone

Drinkard Perforations. Tentative 6242-6859'

7000' Otis Sliding Side-Door

7048' Otis Tubing Seal Divider W/N Profile  
7049' Otis Perma Latch Packer & Tubing Seat

7160' Top of Wantz Granite Wash zone  
Perforations 7165-7219'

7235' Otis W/B Packer  
Perforations 7250-7270'

7285' Halliburton EZ Drill Bridge Plug 7  
Perforations 7290-7308'

7349' PBTD

7393' Liner Seat 5", 15#, J-55, cmt'd w/200 sx  
Cmt circulated around packer at 5066'  
TD 7394'

#4



DRAFT

dr/

BEFORE THE OIL CONSERVATION COMMISSION  
OF THE STATE OF NEW MEXICO

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

CASE NO. 5394

Order No. R-4993

APPLICATION OF SUN OIL COMPANY  
FOR TWO DUAL COMPLETIONS AND TWO  
TUBING EXCEPTIONS, LEA COUNTY,  
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on January 8, 1975  
at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this        day of January, 1975, 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, Sun Oil Company, is the owner and  
operator of its Walter Lynch Wells Nos. 1 and 3, located in  
Units K and M, respectively, of Section 1, Township 22 South,  
Range 37 East, <sup>NMPM,</sup> Lea County, New Mexico.

-2-  
Case No. 5395  
Order No. R-

(3) That the applicant proposes to complete said wells as dual oil completions in the Drinkard and Wantz-Granite Wash Pools as follows:

WALTER LYNCH WELL NO. 1

Production from the Drinkard Pool through 1.315-inch OD tubing from approximately 6800 feet to 5000 feet, thence to the surface through 2-inch OD tubing, and production from the Wantz-Granite Wash Pool through 2 3/8-inch OD tubing from approximately 7138 feet to 5000 feet thence to the surface through 2 7/8-inch OD tubing with separation of the zones by packers set at approximately 5000 feet and 7139 feet.

WALTER LYNCH WELL NO. 3.

Production from the Drinkard Pool through 1.315-inch OD tubing from approximately 6200 feet to 4897 feet, thence to the surface through 2-inch OD tubing, and production from the Wantz-Granite Wash *Pool* through 2 3/8-inch OD tubing from approximately 7048 feet to 4897 feet, thence to the surface through 2 7/8-inch tubing with separation of the zones by packers set at approximately 4900 feet and 7049 feet.

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(4) That the mechanics of the proposed dual completions are feasible and in accord with good conservation practices.

(5) That approval of the subject application will prevent waste and protect correlative rights.

IT IS THEREFORE ORDERED:

(1) That the applicant, Sun Oil Company, is hereby authorized to dually complete its Walter Lynch Wells Nos. 1 and 3, located in Units K and M, respectively, of Section 1, Township 22 South, Range 37 East, NMPM, Lea County, New Mexico, to produce hydrocarbons as follows:

WALTER LYNCH WELL NO. 1

Production from the Drinkard Pool through 1.315-inch OD tubing from approximately 6800 feet to 5000 feet, thence to the surface through 2-inch OD tubing, and production from the Wantz-Granite Wash Pool through 2 3/8-inch OD tubing from approximately 7138 feet to 5000 feet thence to the surface through 2 7/8-inch OD tubing with separation of the zones by packers set at approximately 5000 feet and 7139 feet.

WALTER LYNCH WELL NO. 3.

Production from the Drinkard Pool through 1.315-inch OD tubing from approximately 6200 feet to 4897 feet, thence to the surface through 2-inch OD tubing, and production from the Wantz-Granite Wash through 2 3/8-inch OD tubing from approximately 7048 feet to 4897 feet, thence to the surface through 2 7/8-inch tubing with separation of the zones by packers set at approximately 4900 feet and 7049 feet.

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PROVIDED HOWEVER, that the applicant shall complete, operate, and produce said wells in accordance with the provisions of Rule 112-A of the Commission Rules and Regulations insofar as said rule is not inconsistent with this order;

PROVIDED FURTHER, that the applicant shall take packer leakage tests upon completion and annually thereafter during the annual gas-oil ratio test period for the Wantz-Granite Wash Pool.

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

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