366: Cities Service Oil Co. appl. for dual
oil-oil dual of State "AA" #2 Well,
uum Pool & Vacuum-Seven Rivers Pool, Lea

Case No.

1364

Application, Transcript,
Small Exhibits, Etc.

OIL CONSERVATION COMMISSION
P. O. BOX 871
SANTA FE, NEW MEXICO

February 14, 1958

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P
Y

Mr. Eugene Motter
Cities Service Oil Company
P.O. Box 97
Hobbs, New Mexico

Dear Mr. Motter:

We enclose a copy of Order R-1125 issued February 12, 1958, by the Oil Conservation Commission in Case 1364, which was heard on January 7th at Santa Fe.

Very truly yours,

A. L. Porter, Jr.
Secretary - Director

bp
Encl.

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 1364
Order No. R-1125

APPLICATION OF CITIES SERVICE OIL COMPANY FOR AN OIL-OIL DUAL COMPLETION IN THE VACUUM POOL AND VACUUM-SEVEN RIVERS POOL IN LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on January 7, 1958, at Santa Fe, New Mexico, before Daniel S. Nutter, Examiner duly appointed by the New Mexico Oil Conservation Commission, hereinafter referred to as the "Commission," in accordance with Rule 1214 of the Commission Rules and Regulations.

NOW, on this 12th day of February, 1958, the Commission, a quorum being present, having considered the application, the evidence adduced, and the recommendations of the Examiner, Daniel S. Nutter, 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, Cities Service Oil Company, is the owner and operator of the State "K" No. 2 Well, located 1980 feet from the North line and 660 feet from the East line of Section 27, Township 17 South, Range 35 East, NMPM, Lea County, New Mexico.

(3) That the applicant proposes to dually complete the said State "K" No. 2 Well in such a manner as to permit the production of oil from the Vacuum Pool through one-inch tubing, and to permit the production of oil from the Vacuum-Seven Rivers Pool through two-inch tubing, and that the applicant proposes to equip the well with a dual-zone pump operated by a single rod string.

(4) That the pool which the applicant refers to as the "Vacuum-Seven Rivers Pool" was redesignated by Commission Order No. R-1105, dated December 30, 1957, as the "Vacuum-Yates Pool," effective January 1, 1958.

(5) That communication between the Vacuum Pool and the Vacuum-Yates Pool would cause underground waste.

(6) That the use of the proposed dual-zone pump operated by a single rod string would greatly increase the risk of communication between the two pools.

(7) That there is danger that the proposed dual completion will cause underground waste and that the subject application should, therefore, be denied.

IT IS THEREFORE ORDERED:

That the application of Cities Service Oil Company in Case No. 1364 be and the same is hereby denied.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

EDWIN L. MECHEM, Chairman

MURRAY E. MORGAN, Member

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

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EXAMINER HEARING
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
January 7, 1958

IN THE MATTER OF: Case No. 1364

TRANSCRIPT OF PROCEEDINGS

DEARNLEY - MEIER & ASSOCIATES
INCORPORATED
GENERAL LAW REPORTERS
ALBUQUERQUE, NEW MEXICO
3-6691 5-9546

EXAMINER HEARING
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
January 7, 1958

IN THE MATTER OF:

Application of Cities Service Oil Company for an oil-oil dual completion in the Vacuum Pool and Vacuum-Seven Rivers Pool in Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order authorizing the dual completion of its State "K" No. 2 Well located 1980 feet from the North line and 660 feet from the East line of Section 27, Township 17 South, Range 35 East, Lea County, New Mexico, in such a manner as to permit the production of oil from the Vacuum Pool through one inch tubing and oil from the Vacuum-Seven Rivers Pool through two inch tubing. } Case 1364

BEFORE: Mr. Daniel S. Nutter, Examiner

TRANSCRIPT OF PROCEEDINGS

MR. NUTTER: The next case will be Case 1364.

MR. COOLEY: Application of Cities Service Oil Company for an oil-oil dual completion in the Vacuum Pool and Vacuum-Seven Rivers Pool in Lea County, New Mexico.

MR. HOLL: Alfred O. Holl, appearing for the applicant, Cities Service Oil Company. We have one witness.

(Witness sworn.)

E. F. MOTTER,

a witness, of lawful age, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

By MR. HOLL:

Q Would you state your name and address, please?

A E. F. Motter, Hobbs, New Mexico.

Q By whom are you employed and in what capacity?

A Cities Service Oil Company, District Petroleum Engineer.

Q Have you previously testified before this Commission as an expert in matters such as this cause?

A Yes.

MR. HOLL: If no objection, we will ask that the witness's qualifications be waived.

MR. NUTTER: The witness is qualified.

Q Are you familiar with the application in this cause, Mr. Motter?

A Yes, I filed the application myself.

Q Is the well which is the subject of this application under your direct supervision and direction?

A Yes, it is.

Q Would you explain to the Commission the purpose of this application?

A Well, this application is to allow dual completion of the Cities Service State "K" No. 2, located 1980 feet from the north line, 660 feet from the east line, in Section 27, Township 17 South, Range 35 East, Lea County, New Mexico. This well is currently producing from the San Andres formation and we wish to dual the well

so as to produce from both the San Andres and Yates formation.

(Cities Service Exhibit "A" marked for identification.)

Q I hand you what has been marked as Exhibit "A" by the reporter, and ask you to identify and explain it when the Examiner has a copy.

MR. NUTTER: Just one moment. The well in question is the State "K" No. 2?

A Yes, that is correct.

MR. NUTTER: The original application filed for this hearing was for the State "K" No. 1?

A That's right.

MR. NUTTER: But the well to be dually completed was changed by a letter of amendment?

A December 18th we asked that it be changed. I will make reference to that later in my testimony.

Exhibit "A" is a plat of the area in question showing the Cities Service State "K" lease, the offset producing wells, the offset operators. I might point out that all these wells that are numbered and do not have a dash under the number are San Andres wells. Those wells which are numbered and have a dash under them are Vacuum-Seven Rivers wells, and I had better explain that. That I believe right now is being listed in the proration schedule as Vacuum-Seven Rivers Pool, but it is my understanding that will be changed to Yates.

Q Have you performed any tests to determine if this State "K" No. 2 is oil productive in the Yates formation?

A No, sir, but if you will again notice Exhibit "A", there are some seven or eight wells now producing from the Yates formation in that immediate area.

Q Now why did you choose to dually complete the State "K" No. 2 rather than the State "K" No. 1, which is offset by a Yates producer?

A We believe there is a better chance for an oil completion with a low gas-oil ratio in the Yates formation in the State "K" No. 2 than in the State "K" No. 1. Again referring to Exhibit "A" the Standard of Texas State "4-27" well No. 6, which is a south offset to our "K" No. 1, has a high gas-oil ratio and the well, the No. 7 well, which is a west offset to that, or a diagonal, southwest diagonal offset to State "K" No. 1, has produced no oil to date, and I think the latest test is about 13 MCF of gas.

MR. NUTTER: Which well is that?

A Standard of Texas State "4-27" No. 7; that would be located in the Northeast Quarter of the Southwest Quarter. We have it shown as a location. That well has actually been tested.

MR. NUTTER: As a gas well?

A No oil has been produced, we will put it that way. I wouldn't hardly consider 13 MCF a gas well, but I think perhaps they will continue working on that well. We prefer to attempt this dual completion on the State "K" 2; our next exhibit will bear out a

little more why we desire that. If the State "K" 2 is successful, we will probably -- I shouldn't say if it is successful, if the Commission approves and it is successful, we will probably approach the Commission again to dual the State "K" No. 1.

(Cities Service Exhibit "B" marked for identification.)

Q I hand you what has been marked as Exhibit "B" by the reporter and will ask you to identify and explain that exhibit.

A Exhibit "B" is a contour map on top of the Seven Rivers, formation in this area. The pay section is in the base of the Yates, as we define it, so for convenience and picks of logs we contoured this on top of the Seven Rivers, and as I explained previously, I believe that the proration schedule, as I understand it, is to be changed to Vacuum-Yates quite soon.

MR. NUTTER: At this point, let's clear the record on the Seven Rivers and Yates. At the Commission hearing on December 18, testimony was presented that the formation in which these wells in the area in question, that these wells were completed in the Yates formation which originally had been thought to be the Seven Rivers, but additional geological information reveals that this is the Yates formation for this pool; and it has been redesignated as the Vacuum-Yates Pool.

A Thank you. I didn't know it had been redesignated as yet. We will refer to it from here on in as the Vacuum-Yates Pool. This contour map will substantiate our reasons for attempting a dual

completion in the Yates formation State"K" 2 rather than the No. 1. I think you can see quite clearly that it will probably be some twelve or thirteen feet lower than the No. 1 well. We think that we can make a lower gas-oil ratio oil well in the "K" 2 than on the "K" 1.

Q Do you have a Gamma Ray-Neutron log for the Examiner?

A Yes, we have a Gamma Ray-Neutron log.

(Cities Service Exhibit No. "C" marked for identification.)

A It has been marked Exhibit "C", and we have marked the tops of the various pays, San Andres, and on a five-inch scale we have marked the top of the Seven Rivers, and also where we will probably attempt a completion if this case is allowed. I do not say those will be the exact perforations, but they will probably be in that area. Also this has the top of the San Andres formation located down at minus 430, which shows what the other pay formation is.

Q Now have these two reservoirs for which you plan the dual completion been separated behind the casing?

A Well, five and a half inch casing was run to 4192 feet and cemented with 150 sacks, which was not enough to cover the Yates formation. We plan to perforate and squeeze the formation below the Yates pay to separate perforation between the two producing zones.

Q Do you feel that there might be migration of fluids between the San Andres and the Yates?

A No, the San Andres is adequately protected to prevent any upward movement of fluid, in my opinion.

Q What is the remainder of the casing program for the State "K" No. 2, other than the five and a half inch casing?

A Eight and five-eighths inch casing is set at 1650 feet with 350 sacks of cement.

Q Are all the fresh water zones adequately protected?

A Yes, they are.

Q Will you describe the procedure for dualling a well, and referring to Exhibit "D", which we will ask the reporter to mark, please?

(Cities Service Exhibit No. "D" marked for identification.)

A Well, I should explain this exhibit is the proposed method of dual completion; however, before we can do this, we must determine whether the Yates is productive, and I will explain how we plan to do that. We plan to set a drillable bridge plug at approximately 3200 feet, perforate and squeeze the Yates formation, drill out the cement, perforate and test the Yates formation. If the Yates is found productive, the bridge plug will be drilled and a Baker Model "DA" production packer will be set at approximately 4150 feet. This packer will separate the two zones of production at all times. Two inch tubing will be run from the Model "DA" packer up to the wellhead. A crossover assembly will be made up of two inch tubing at approximately 3,050 feet. I think we show it 3,060,

somewhere in that neighborhood. A one inch tubing string will be run from the crossover assembly up to the wellhead. Production from the lower zone will enter the two inch tubing string, will come up to the crossover assembly, and enter the one inch tubing onto the surface. The production from the upper zone will enter the crossover assembly and proceed up the two inch tubing to the surface.

Q Now you say that both these zones will be pumped. How will this be accomplished?

A We have prepared, I believe it is Exhibit "E" that I have up here on the wall. I have copies, but I will be glad to attempt an explanation of that.

MR. HOLL: We will ask the reporter to mark this as Exhibit "E".

(Cities Service Exhibit No. "E" marked for identification.)

A This I should explain first is a two-zone pump method on a single rod string starting at the very lowest; here, this will be our Model "DA" production packer. This will be our lower zone pump. You will notice a vent tube around the side of the lower zone pump; this vent tube is so designed, with this check valve arrangement here, that any gas will be vented up above the pump to prevent gas locking of the lower pump. As we proceed on up the assembly, this assembly right in here latches the back of the assembly between the two pumps in place. There is actually a polish rod with a packing element to prevent fluid from entering the upper zone production.

The fluid from the bottom zone will come up this pump or up to the one inch tubing to the surface. The production from the upper zone will enter through the crossover assembly right below the barrel of the upper pump on through the two inch tubing through the surface. If there are any other questions I will refer to it later, or you can ask it now.

Before I go on, I might say that bottom hole pressure, if ever needed, can be taken, of course, with this assembly we can pull both pumps, and the latching device that holds the pack-off element in place between the two pumps is so designed that wire line equipment can be used and plugs set in there to take bottom hole pressure. The back-off tool would allow pressures to be taken on the upper, and straight-through tool would allow the pressure to be taken on the bottom zone. I might further tell the Examiner that in case we ever had to pull the pump and leave it out of the hole for some time, we would no doubt run a wire line equipment to separate the two zones so that they would not commingle.

I believe I explained most of this process of taking bottom hole pressures in a previous application that we had on Cities Service State "P" No. 2 well. This is identical equipment, except we are using the two pumps on a single rod string.

Q In your opinion, is this installation in accordance with good engineering practices and principles?

A Yes, and I might add that we have several installations very typical of this now producing or pumping in the Goldsmith Field

in Ector County, Texas. They have been quite successful. We think that this is pretty good equipment for this type of work, when you are limited to using only one string of two inch tubing, since we have only five and a half inch casing in place.

Q I assume this technique has been recognized and accepted in general by the oil industry and other State regulatory bodies?

A Yes, it has. As I explained, we are using it over in Texas now.

Q Do you think that corrosion will be any factor in this?

A Well, we have very little evidence of corrosion in the San Andres right now. No corrosion has made itself, or has appeared on our down hole equipment, and we do not believe the Yates formation to be corrosive either.

Q Do you feel that this method of dual completion will present any more possibility of leakage or communication of reservoirs than other accepted methods?

A No, sir, I do not.

Q If this application is approved, will you be willing to take proper leakage tests?

A Yes.

Q Packer leakage tests?

A Packer leakage tests, yes.

Q Do you have bottom hole pressures on these two zones?

A Yes, sir, we just ran a bottom hole pressure on the State "K" No. 2. We found that to be 788 pounds per square inch, and one

of the operators has reported to us a pressure of 1711 pounds on the Yates formation. I checked with the same operator a couple of times on that. That seems to be right. He has a shut-in pressure of some seven hundred pounds on the surface. That particular well is flowing, but a couple of offsets are pumping, so it may be high. I don't know whether it is a local condition or what it is, but it seems to me like it is pretty high for that depth of production.

Q How much differential pressure will occur in the packer?

A You mean across the packer?

Q Across the packer.

A Approximately 1400 pounds.

Q Do you believe that this packer will adequately handle that differential pressure?

A Yes, I certainly do.

Q Do you have the gravities of the oil in the two formations?

A 37.6 degrees API on the San Andres, and the Yates is 36 degrees API. The gravity on the Yates was taken from the forms filed with the Commission office in Hobbs.

Q Will this production be separately tanked and gauged?

A Yes.

Q To surface?

A Yes, it will.

Q With two pumps on a single rod string, what do you propose if one zone has produced its allowable before the end of the month and the other zone is under its allowable at the same time?

A Fortunately, both of these zones fall in the depth limit of less than five thousand feet so they'll have the same allowable. What is normally done in this case is that the bottom pump naturally is smaller than the upper pump. However, the upper pump taking out your displacement for your rod going down to your bottom pump will not have its full producing capacity, even though it will probably be some quarter or half inch larger. In case the upper zone production exceeds the bottom zone, all we do is turn the production into the annulus and circulte it until the two zones are in balance.

Q Do you prefer to dually complete this State "K" No. 2, rather than drill a singly completed well in the same forty acre tract to the Seven Rivers formation?

A Yes, we certainly do.

Q What is your reason for this?

A We have watched performances of the wells that have been completed in the Yates and have found that some of them had to go on the pump pretty fast, and we have enough core and log data to make some type of recovery preduction. We believe that the cost of a single completion is not justified at this time.

Q Have you prepared estimates on the cost of single completion?

A Yes, sir, we have made an estimate and have conferred with other operators in the area on the cost of drilling a well to the Yates formation. Our estimate agrees very well with the actual costs by several other operators. We have prepared an exhibit on the cost of a single completion.

MR. HOLL: This will be Exhibit No. "F".

(Cities Service Exhibit No. "F" marked for identification.)

MR. HOLL: And also Exhibit "G" and Exhibit "H".

(Cities Service Exhibits No. "G" & "H" marked for identification.)

Q Would you explain these three exhibits, Mr. Motter?

A Well, Exhibit "F", of course, is the cost of drilling a singly completed well to the Seven Rivers. I said, I referred to the Yates, we probably will have to go to the Seven Rivers. That total is $47,336.00.

Exhibit "G" is our estimate of a dual completion to the same zone employing this equipment that we have shown, and we estimate that to be $26,694.00, or the cost of a dual will be $20,642.00 less than the single completion.

Q Have you calculated any reserve estimates of these formations?

A Yes, one operator in the field has cored, I believe, four wells, and we have used their reservoir analysis on these cores and compared the logs on those same wells to the Cities Service State "K" No. 2 log. The pay section as shown by the logs compared quite favorably, but the Cities Service State "K" 2 well has about two or three feet less net pay than the wells on which we have core analysis. By using the average recoverable oil as indicated by core analysis and net feet of pay from the Gamma Ray-Neutron Log on State "K" No. 2, I have estimated a gross recoverable oil to be 35,000 barrels. Past performance of wells recently completed indicates

this to be slightly high, and I have checked with some other operators. I believe they are giving that estimate or perhaps just a little bit lower. I have, on Exhibit "H", down at the bottom there, shown how I arrived at that 35,000 barrels.

Q And you have made a comparison of the two types of completion as to cost, net profit and payout?

A Yes. If you will refer to Exhibit "H", we have shown, starting at the top, of course, we have a gross recoverable oil will be the same for both the single and dual, and net oil will be the same. Earnings the same, operating expense for the single completion we have at fifty cents per net barrel, which is $15,305.00; for the dual we have indicated ten cents per barrel more which increases that some $3,000.00. We take out taxes and show our net earnings with a payout of one hundred forty-three percent on the single, as compared to two hundred forty-two percent on the dual. If we had left the cost of operating for the dual the same as the single, which we could very easily do, the two still show a better payout on the dual by some ten or fifteen percent.

Q Now, were these Exhibits "A" through "H" prepared by you or under your supervision?

A Yes, they were.

MR. HOLL: We ask the admission of Exhibits "A" through "H".

MR. NUTTER: Is there objection to introduction of Exhibits, Cities Service Exhibits "A" through "H"? If not, they will be

received.

MR. HOLL: That's all we have.

MR. NUTTER: Anyone have any questions of Mr. Motter? Mr. Utz.

CROSS EXAMINATION

By MR. UTZ:

Q Mr. Motter, ordinarily in dual completions we have only one possibility of commingling between zones, and that is through the packer, is that right?

A Yes.

Q On this setup we have two?

A Yes, I believe, as I explained before, if we pull that pump for any length of time we could have commingling there.

Q Do you know, or have the people that supply this equipment to you given you any idea of how effective the seal is on the pump shaft between the two formations, the polished rod and the packer assembly?

A Well, they, of course, tell us that it is nothing but the best. We have looked it over and we think it is satisfactory, and see no reason why it will not serve the purpose for what we intend to do.

Q It is my understanding that on a pumping well they have considerable packer trouble at the surface. It is not uncommon that they have to replace those packers quite frequently, am I correct?

A I believe you are referring to a stuffing box, is that right?

Q That's right.

A Yes, that is very true. I think, though, that on this particular installation the polish rod here will be oil wet on both sides of the packing assembly, whereas on the surface you have, it will be oil wet on only one side, and therefore I think you'll have a less chance for leakage or your packing should be lubricated as your polish rod travels through your packing from one side to the other. I think that that is a chevron-type packing which, as the pressure increases, it is supposed to pack off more extensively.

Q If that packer should fail, how would you detect the commingling between zones?

A Well, we have, of course, a difference in gravities would be the main protection.

Q The difference in gravities?

A Yes.

Q Do you plan to take gravities frequently?

A Well, every tank will have to have a gravity taken on it as it is sold. We will have that each time.

Q I believe you stated that if the upper zone produced its allowable sooner than the lower zone, you would recirculate the upper zone production through the annulus?

A Yes.

Q If the lower zone produced its allowable first, what would you do?

A If the lower zone produced its allowable first, what we

would have to do in that case would be to change the size of the pumps, so that the lower zone pump would be much smaller. In other words, that would be something that we would have to work out for the next month's production. In other words, we would attempt to make the lower zone production slightly less than the upper zone.

Q By that method you would stay within the 125 percent tolerance?

A Yes, we should be able to quite easily.

Q Can you tell me what the minimum restriction is in your crossover assembly?

A I believe that the seating assembly will allow 125 - 30 seconds is the idea of that. Is that what you have reference to?

Q I had reference to the restriction of the oil flowing through the crossover assembly.

A Well, let me refer to this drawing.

Q What size orifice?

A There will be some restrictions; this, of course, is a cutaway. This has ports to allow the fluid to go through there. I don't know exactly what size those ports are, but they, I'm quite positive, are greater than the area of the one inch tubing.

Q You think they are?

A Yes, I'm quite sure.

MR. UTZ: That's all the questions I have.

MR. NUTTER: Anyone have any further questions of Mr. Motter?

By MR. NUTTER:

Q Mr. Motter, you stated that gravity of the San Andres is 37.6, and the gravity of the Yates oil is 36?

A Yes, that's right.

Q What is the GOR in the San Andres formation?

A The GOR, I believe is around 1300 to one.

Q What do you anticipate as a GOR in your State No. 2 in the Yates?

A That is going to be real hard to say right now. As I told you, we have this well down here, a Standard of Texas, No. 6, that is a fairly high GOR. I think that the production is not great enough that it is a penalized allowable, but I would say roughly that the Yates GOR, if we get wells comparable to those that Magnolia has down south, it will probably be in the neighborhood of one thousand to one.

Q So there won't be any material difference between the GOR's in the Yates and the San Andres formation, will there?

A Well, you might say about four hundred cubic feet per barrel, something like that.

Q Is the Yates oil a corrosive oil or sweet oil or what?

A I believe it is considered sour crude, but as far as corrosion effect on equipment, I find no trouble.

Q This polish rod, that operates through that packer that separates the two zones, is a corrosion resistant polish rod?

A You can buy those either way you want. It can be stainless

monelitic metal you need.

Q Would you install a polish rod that would be resistant to corrosion?

A We would, it probably would be a high nickel or some type of rod like that.

Q Has Cities Service had experience operating this type of pump?

A Yes, down in the Goldsmith Field, I believe we have four operating that the lower zone is producing from 7100 and the upper zone from about 3,000. They're working just mighty fine.

Q Is that in an area where the oils are corrosive oils?

A Well, I should say no, it would be Permian Basin crude, probably considered a sour crude, but I would say they are not corrosive.

Q Has Cities Service experienced any problems at all as far as leakage through the packer or through the packing element that separates the two zones?

A To date, I probably should qualify myself, this is not in my area, it is in another district, but we have had none reported to us. Normally anything of that nature, new equipment, if we find failures or have trouble, we try to circulate the information immediately, and none has been reported to me at all.

Q You couldn't state that they haven't had any trouble?

A No, I have had some communication from the engineers whose area this is in, and as I say, they are more than satisfied or quite

satisfied with the hookup.

Q Are the allowables in the two zones over there in Texas equal to each other as they would be here?

A No, I think there is some difference because that is quite a difference in depth, from 3,000 to 7100. I'm not sure what the allowables are, but I can reasonably say that they should be some greater at the 7100 than the 3,000.

Q Have the engineers been able to size the pumps so that the two zones make their allowables at the same time?

A Yes, we can size the pumps. We can go on the bottom there up to, I believe, an inch and three quarters. Of course, the upper pump can be the same size as the tubing, it can be a full two inch pump.

Q So by sizing the pump, you can approximate the exact allowable in each zone at the same time?

A One thing I should point out here, this polish rod that comes on down through here, you realize that when the pump is in a down stroke, this area of the polish rod is always taken out of the displacement, whereas down here so, there is some difference in the two there. So even though this is a bigger pump, it may not produce as much as this lower pump.

Q What about the Vacuum Pool there in the San Andres formation, does that make any paraffine?

A Yes, that makes some paraffine; I checked the records of these wells that we have producing, those four wells, and I don't

believe we have cut any paraffines out there or had pulled the wells for a period, it seems to me like three years. I might add that we have included in the cost of this dual, let's see, plastic coating, 3350 feet of one inch tubing, which the reason we are doing that is for paraffine control.

Q You believe that plastic coating, this one inch tubing, will eliminate the paraffine problem there?

A Yes, we do.

Q Mr. Motter, your Exhibit No. "H", I follow you down to the point where the single completion will have a net earnings of $67,000.00 and the dual completion will have a net earnings of $64,000.00. The two development expenses are taken off of Exhibits "F" and "G"?

A That is correct.

Q I don't follow the net profit for the two types of completions.

A I see we have an error here. That should be $20,154.00 instead of $30,000.00. Maybe we should correct that for the record.

Q I don't think it is $20,154.00.

A Let me go back through here. I believe I can explain that. Oh, pardon me, that is correct. That 47,000 should come off of the -- that's right, it should be $20,154.00.

Q Is that a direct subtraction of 47,000 from 67?

A Should be. There must be an error. It should be $20,314.00, I guess. I don't have a slide rule with me. Do you have one there to see if that percentage is the same?

Q No, I haven't.

A Actually it would cut it down lower.

Q In other words, the correction of this error makes the dual completion more attractive than you thought?

A Yes, that is correct.

Q What's the present productivity of these wells of yours in the Vacuum Pool?

A Those wells are all producing top allowable, those San Andres wells.

Q All top?

A Yes, I have some recent tests, I think two of them are capable of producing eighty or ninety barrels; the other, some in the neighborhood of fifty.

Q What has been the producing history in the Yates Pool?

A We don't have too much history. The wells have only been completed three or four months.

Q How many wells have been completed at the present time?

A I believe Magnolia has four wells down there, referring to this exhibit, that is in the Northwest Quarter of Section 34. I do not believe that No. 8 is producing at the present time. Standard of Texas has two wells producing in the West Half of the Southeast Quarter, that is No. 5 and 6, as I stated previously; they are doing some work on No. 7; No. 8 has been reported as a location, I do not know whether that well has been drilled as yet or not.

Q Magnolia's wells in Section 34, are they producing top

allowables?

A Yes, one of the wells is flowing, and I believe that No. 6 is a flowing well, and the other two wells are pumpers. They are all producing top allowable.

Q Producing top allowable?

A No, let me take that back. One is only making thirty-three barrels.

Q How about Standard's wells there in Section 27?

A No. 5 is, I don't know what that particular well is making. No. 6 is only making some thirteen or fourteen barrels a day.

Q You don't believe that the producing history of these wells plus the anticipated future of them justifies a single completion?

A No, I certainly don't. We know that some of the wells are on a pump now, I believe that our exhibits pretty much bear that out. I have talked to engineers of some of the other companies that operate down there, and they tell me that they have estimated about this same recovery, but they stated also they thought they were high. You notice I estimated the primary recovery at twenty percent. I talked to Core Laboratories about that, they made the analysis on the cores, and they seem to think that figure is probably pretty close.

Q Now back to your Exhibit No. "H", Mr. Motter. I note that you show operating expenses ten cents a barrel higher for the dual completion than for the single?

A Yes.

Q Why do you expect the operating expenses to be higher?

A We did that because we thought that perhaps with two pumps in there, we thought we might have more trouble, we might have to pull it; we might have to pull it more often than a single completion.

Q By having a higher operating expense, you would probably reach the economic limits sooner, wouldn't you, on the well?

A Yes. I might explain another thing. Of course, that is brought out also on the single completion. On a dual we can use the surface pumping equipment that is in place right now, whereas we would have to buy an additional pumping unit for the single completed well.

Q But with higher operating expense, you would reach the economic limits sooner?

A Yes.

Q In other words, you wouldn't have the same amount of oil recovered from a dual that you would from a single, would you?

A I will put it this way; we will reach the economic limits sooner, but our development expense would be so much less that we consider this is the best method to attempt this completion.

Q But by reaching the economic limits sooner, you would have to abandon the well sooner?

A Yes, that would be true.

Q Yet you have shown the same amount of gross recoverable oil and net recoverable oil from the two projects?

A Maybe I should go back to my previous statement. I think

we said that we do not know they will be ten cents higher. We went ahead and called it ten cents, but we did show the same net recoverable oil in both cases. The economic limit may enter in there and knock off a few thousand barrels.

Q Do you think that the difference in gravity of 1.6 degrees is sufficient to note a leak, should a leak occur?

A I believe that unless a leak is very minute that we could do that. Of course, we can always go in there and run bottom hole pressures to determine if there is any communication between the two zones,or check the packer.

Q One more question, Mr. Motter. You stated that you were going to plastic coat your one inch tubing?

A Yes.

Q Do you think that this intricate system of pumps and cross-over will present any problem as far as paraffine is concerned?

A It possibly could, but we can go ahead and pull the rod string and cut the paraffine on the two inch easily, and cut down to the bottom pump or where the lower pump is seated, in case it gives us trouble. As I stated previously, the San Andres on this particular lease, we have produced those wells for three years without pulling the pumps, so we do have paraffine trouble, I'll say that, but we have operated that long without having --

Q (Interrupting) Do you use any solvent or anything?

A No, we are not, and it would be impossible to use solvents on the bottom zone with the particular hookup. We do use scrapers

out there.

Q Now, Mr. Motter, in your honest opinion, do you believe that any oil will be lost by dually completing this well as a result of higher operating expenses or running into paraffine problems or such things as that?

A Let me do a bit of quick figuring. If it is $3,000.00 more to operate the dual, that would be, say, roughly $2.00 a barrel, that would be what, about 1500 barrels that we might not recover in the dual rather than over a single completion, which wouldn't be adequate, I don't think.

Q How much additional earnings would Cities Service have by this?

A We would have, according to this we would have about $17,000.00 or close to $18,000.00 additional earnings by the dual rather than the single completion.

MR. NUTTER: Does anyone have any further questions of Mr. Motter? Mr. Utz.

By MR. UTZ:

Q You said that you had some of these units in operation in the Goldsmith Field?

A Yes.

Q How many do you have?

A There are four. Right now we have six installations, but there are only four that have the two dual pumps on a single rod string. I think the other two wells, they still have one zone

flowing and the other zone is on one pump.

Q How long have you had these units installed?

A They have been in, I would say, about six months now.

Q You don't have much history on them yet?

A No. I might add here, while we are talking about this, our Hobbs office is a division office also, and that is under the direct supervision of the division, and we do get nearly all information that comes through there. If we had any trouble, I'm sure we would have been told about it.

Q Do you have any idea how deep that you can efficiently pump, using this type of unit?

A Well, the boys that sell the equipment tell me that when you design rod strings and so on and so forth, they usually neglect the effect of the upper pump, or just design for the fluid hydrostatic to the lower pump, or design the rod string on that basis, and also design their surface pumping equipment on that basis. They tell me that even though you would think a hydrostatic head on the upper pump would add something to it, that a dynamometer result does not bear that out.

Q Then I gather that your answer is that you can go any depth you want to?

A Of course, you are limited some on rod strings, but we could go fairly deep.

Q By "fairly deep", what do you mean, six thousand?

A No, I think I stated previously we have those electro counted

7100, I would say we could go down to 8500, 9000 feet with one of these set-ups.

Q One last question. How do you propose to test the packer on this well?

A We can test the packer by running in the wire line equipment and running the bottom hole pressures on the two zones, separate the two zones before we install this pumping equipment. The only thing --

Q (Interrupting) Before you install the pumping equipment?

A Yes. What we will have will be the pressures of the two zones, so that we know they are not equal and that should test our packing, the packer seal in the Model "DA" production packer.

Q You test it under static conditions?

A Yes.

Q Normal bottom hole pressure?

A Yes, sir.

Q That difference in pressure you said was what?

A We had the one pressure 1711 on the Yates, which I think is a little high for that depth of production, but we did have a bottom hole pressure on our well 788 pounds, and that is quite a little difference right there.

Q I don't believe I noted what your lower completion pressure was?

A 788 pounds.

Q 788. Do you think that sufficient pressure differential

to properly test the packer?

A Yes, I think it is, we calculate, if that 1711 pounds is borne out by that Yates formation.

MR. UTZ: That's all I have.

MR. NUTTER: Any further questions of Mr. Motter? If not, he may be excused.

(Witness excused.)

MR. NUTTER: Does anyone have anything further they wish to offer in Case 1364? We will take the case under advisement, and recess the hearing until 1:00 o'clock.

(Recess.)

* * * * * * *

C E R T I F I C A T E

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Proceedings before the New Mexico Oil Conservation Commission was reported by me in stenotype and reduced to typewritten transcript under my personal supervision, and that the same is a true and correct record to the best of my knowledge, skill and ability.

WITNESS my Hand and Seal this 20th day of January, 1958, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Ada Dearnley
NOTARY PUBLIC

My commission expires:

June 19, 1959.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 1364 heard by me on 1-7, 1958.

Examiner
New Mexico Oil Conservation Commission

CITIES SERVICE OIL COMPANY

BOX 97

HOBBS, NEW MEXICO

December 18, 1957

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Attn: Mr. A. L. Porter, Jr.

Re: Dual complete State "K" No. 2,
Vacuum Pool, Lea County, New
Mexico

Gentlemen:

On November 6, 1957, Cities Service requested a hearing to consider dual completion of the State "K" No. 1, located 1980' FNL, 1980' FEL, Section 27, T-17-S, R-35-E, Vacuum Pool, Lea County, New Mexico. It is respectfully requested that this application be amended to allow dual completion of the State "K" No. 2, located 1980' FNL, 660' FEL, Section 27, T-17-S, R-35-E, Vacuum Pool, Lea County, New Mexico.

Logs have been run on these two wells since the application of November 6, 1957, was submitted and it was found that the State "K" No, 2 is more favorably located on structure for completion as an oil well from the Yates formation than the State "K" No. 1. Dual completion of the State "K" No. 2 will be the same method as described in the application for dualling the State "K" No. 1.

A copy of this application for amendment has been sent to each of the offset operators named on the attached list.

Very truly yours,

E. F. Motter

E. F. Motter
District Engineer

EFM/gb
Attach.

M A I L I N G L I S T

Drilling & Exploration Co., Inc.
Box 2075
Hobbs, New Mexico

Magnolia Petroleum Company
Lea County State Bank Bldg.
Hobbs, New Mexico

Penrose, Neville G., Inc.
Eunice, New Mexico

Phillips Petroleum Company
Box 2105
Hobbs, New Mexico

Shell Oil Company
Box 845
Roswell, New Mexico

Standard of Texas
Box 1660
Midland, Texas

Oil Conservation Commission
Box 871
Santa Fe, New Mexico

Oil Conservation Commission
Box 2045
Hobbs, New Mexico

CITIES SERVICE OIL COMPANY

BOX 97

HOBBS, NEW MEXICO

Ex hrg 1-7-58

November 6, 1957

Vacuum (San Andres) Pool
Vacuum Upper Pennsylvanian Pool

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Attn: Mr. A. L. Porter, Jr.

Re: Dual complete State "K" No. 1
Vacuum Pool, Lea County, New Mexico

Gentlemen:

It is respectively requested that the Oil Conservation Commission schedule an examiner hearing at an early date in Santa Fe, New Mexico, to consider our application to dually complete the State "K" No. 1, located 1980' FNL, 1980' FEL, Section 27, T-17-S, R-35-E, Vacuum Pool, Lea County, New Mexico. The attached Exhibit "No. 1" shows the location of Cities Service Oil Company State "K" lease together with all offset wells and their operators.

Cities Service proposes to dually complete the State "K" No. 1 in the following manner:

1. Equip the well as indicated on the attached schematic diagram.
2. Produce oil from the Seven Rivers formation through 2" tubing from perforated intervals 3050' to 3057'.
3. Produce oil from the San Andres formation from open hole 4190' to 4625'. Thru 1" tbg

A copy of this application with plat and schematic diagram included has been sent by registered mail to each of the offset operators named on the attached mailing list.

Very truly yours,

E. F. Motter

E. F. Motter
District Engineer

EFM/gb
Attachs.

M A I L I N G L I S T

Drilling & Exploration Co., Inc.
Box 2075
Hobbs, New Mexico

Magnolia Petroleum Company
Lea County State Bank Bldg.
Hobbs, New Mexico

Penrose, Neville G., Inc.
Eunice, New Mexico

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Hobbs, New Mexico

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Box 845
Roswell, New Mexico

Standard of Texas
Box 1660
Midland, Texas

Oil Conservation Commission
Box 871
Santa Fe, New Mexico

Oil Conservation Commission
Box 2045
Hobbs, New Mexico

(SCALE 8 IN. = 1 MI.) ONE-SECTION PLAT

SECTION TOWNSHIP RANGE COUNTY STATE

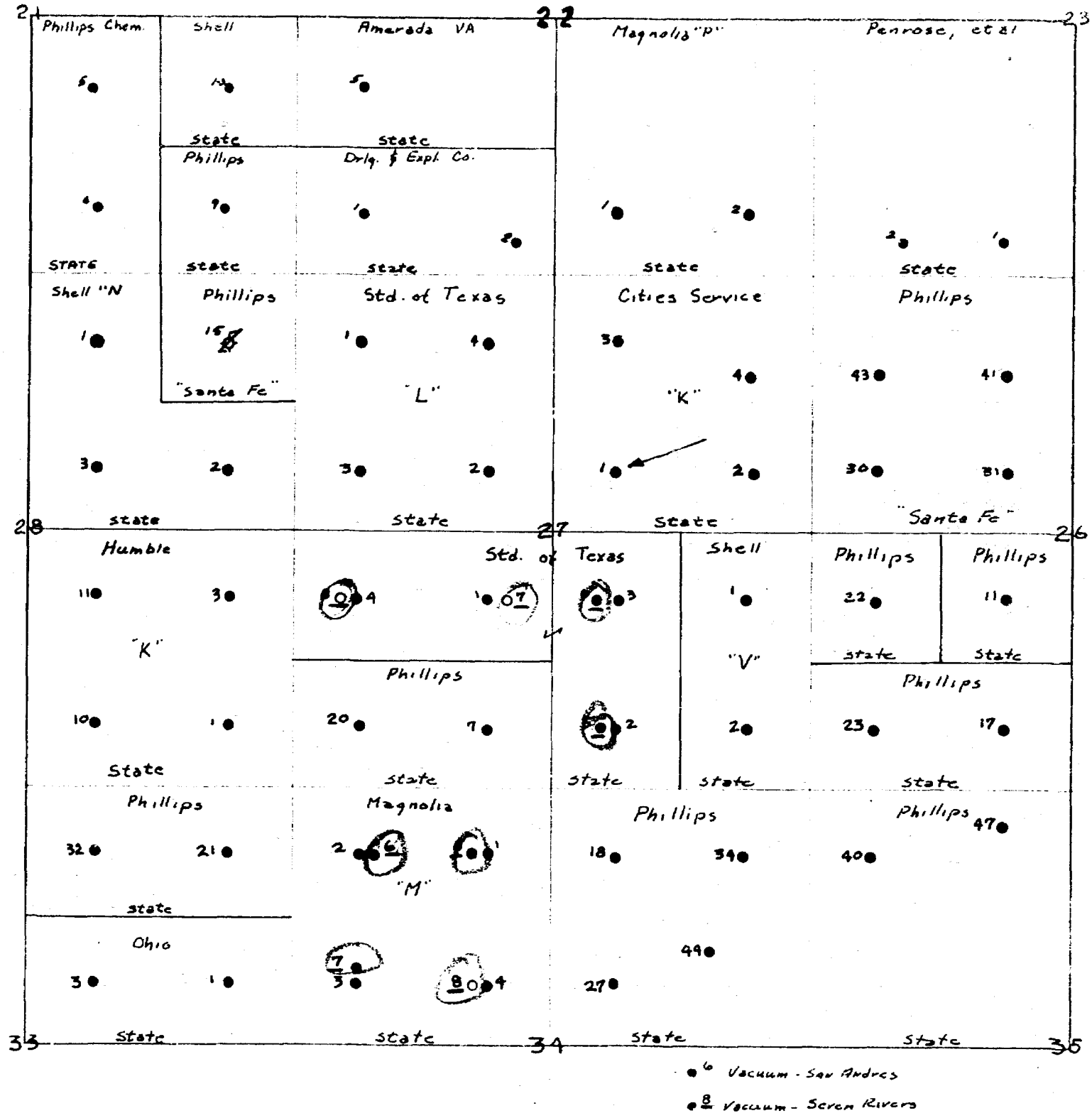


EXHIBIT "1"

DIAGRAMATIC SKETCH OF OIL-OIL COMPLETION

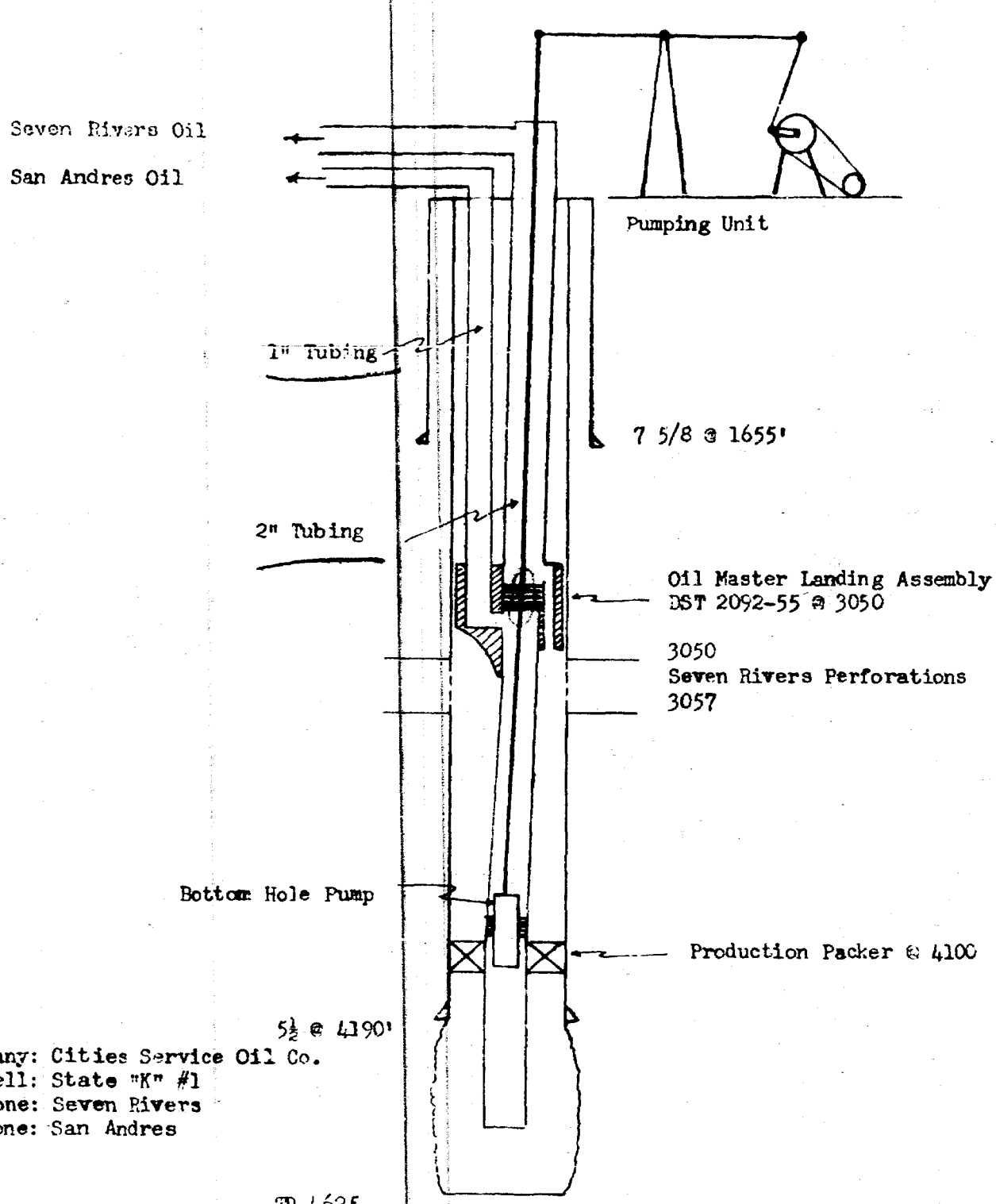


EXHIBIT 2

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

Date 2-6-58

CASE 1364 Hearing Date 1-7-58 9am DSN @ SF

My recommendations for an order in the above numbered cases are as follows:

Enter an order in the subject case denying the applicant the requested authority to dually complete its State "K" No. 2 well in such a manner as to permit the production of oil from the Vacuum Yates Pool and from the Vacuum Pool.

Applicant proposes to complete the well in such a manner as to be able to jump both zones with a dual zone jump operated by a single rod string. The packing glands surrounding the polished rod ~~are~~ would be subject to the possibility of leakage, being under constant differential of pressure as well as the normal wear expected from the movement of the polished rod through them. There is always the inherent danger of communication between

Staff Member

OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

Date_____

CASE_____ Hearing Date_____

My recommendations for an order in the above numbered cases are as follows:

the separate zones of any dual completion with the resultant loss of reservoir energy and fluids as one zones charges the other, due to the possibility of packer failure. I believe that this installation as proposed by the applicant magnifies the above mentioned danger, not two fold by doubling the number of packing elements which might leak, but several fold by adding the ~~the~~ dimension of movement to the packing elements.

The economics of drilling a twin well to the Yates Pool in this case may not be as attractive as the economics of dualling a well, they never are. However, the admitted economics of twinning are such that a well drilled to the Yates would pay out and make a profit. These considerations, plus the impracticality of producing one zone when the other than made its allowable, consideration of the economic limits of dualled vs twinned wells etc all point toward the inadvisability of the dual

Staff Member

Sam Nutter, Examiner

No. 38-57

DOCKET: EXAMINER HEARING JANUARY 7, 1958

Oil Conservation Commission 9 a.m. Mabry Hall, State Capitol, Santa Fe, NM

The following cases will be heard before Daniel S. Nutter, Examiner:

CASE 1356: Application of Cities Service Oil Company for permission to institute a pilot water flood project in Township 14 South, Range 31 East, Caprock-Queen Pool, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks permission to institute a pilot water flood project in the Caprock-Queen Pool, Chaves County, New Mexico, by injecting water into the Queen formation through the following intake wells:

Government "B" No. 5, NW/4 NE/4 Section 10;
Government "B" No. 6, SE/4 SE/4 Section 3;
Government "B" No. 10, NE/4 SE/4 Section 3;
Government "B" No. 14, SE/4 SW/4 Section 3,

all in Township 14 South, Range 31 East.

CASE 1357: Application of Standard Oil Company of Texas for an order authorizing the production into a common tank battery of all oil produced from five leases in the Atoka Pool, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order authorizing the production into a common tank battery of all oil produced from the Atoka Pool from the following described leases: SW/4 SE/4, NW/4 NW/4, NW/4 SE/4, SE/4 NW/4, and SW/4 NE/4 of Section 12, Township 18 South, Range 26 East, Eddy County, New Mexico.

CASE 1358: Application of Magnolia Petroleum Company for an order cancelling Order R-984, and granting authority to commingle the liquid hydrocarbons produced from the Pictured Cliffs and Mesaverde formations into central tank batteries located on certain leases in the Blanco Mesaverde Gas Pool, Tapacito-Pictured Cliffs Gas Pool and certain undesignated Pictured Cliffs and Mesaverde gas pools in Rio Arriba County, New Mexico. Applicant, in the above-styled cause seeks an order cancelling Order No. R-984, and granting authority to commingle the liquid hydrocarbon production from the Pictured Cliffs and Mesaverde formations into central tank batteries located on certain of the applicant's leases in Township 26 North, Range 2 West; Township 26 North, Range 3 West; Township 27 North, Range 2 West, and Township 27 North, Range 3 West, in Rio Arriba County, New Mexico.

CASE 1359: Application of El Paso Natural Gas Company for an order extending the time allowed for making annual deliverability and shut-in pressure tests, and requesting allowables for 237 gas wells in certain prorated, non-prorated, and undesignated gas pools in San Juan and Rio Arriba Counties, New Mexico. Applicant, in the above-styled cause, seeks an

CASE 1359 continued

order extending the time allowed for making annual deliverability and shut-in pressure tests, and requesting allowables for 237 gas wells in the Blanco Mesaverde, Fulcher Kutz-Pictured Cliffs, West Kutz-Pictured Cliffs, Aztec-Pictured Cliffs, South Blanco-Pictured Cliffs, Ballard-Pictured Cliffs, Otero, Canyon Largo, East Companero Dakota, Tapacito, West Kutz-Fruitland, North Los Pinos-Fruitland, and South Los Pinos-Fruitland Gas Pools and in undesignated Fruitland, Pictured Cliffs, and La Ventana gas pools in San Juan and Rio Arriba Counties, New Mexico.

CASE 1360: Application of Gulf Oil Corporation for an order suspending the cancellation of underage accrued to eight gas wells in the Eumont, Jalmat, Tubb, and Blinebry Gas Pools, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order suspending the cancellation on January 1, 1958, of the underage accrued to the following gas wells in the Eumont, Jalmat, Tubb, and Blinebry Gas Pools:

Eumont Pool

Bell-Ramsay St. "C" No. 1, NW/4 SE/4 Section 34, Township 20 South, Range 37 East

Jalmat Pool

Arnott-Ramsay "E" No. 2, SW/4 SE/4 Section 16, Township 25 South, Range 37 East

Arnott-Ramsay "E" No. 5, SW/4 NW/4 Section 16, Township 25 South, Range 37 East

J. R. Holt "A" No. 2, SE/4 SW/4 Section 16, Township 24 South, Range 37 East

Tubb Pool

Hugh No. 7, NE/4 NW/4 Section 14, Township 22 South, Range 37 East

Harry Leonard "E" No. 4, NE/4 NE/4 Section 16, Township 21 South, Range 37 East

Blinebry Pool

J. N. Carson "A" No. 4, SW/4 SE/4 Section 28, Township 21 South, Range 37 East

H. Leonard "E" No. 4, NE/4 NE/4 Section 16, Township 21 South, Range 37 East

all in Lea County, New Mexico.

CASE 1361: Application of The Texas Company for an order suspending the cancellation of underage accrued to two gas wells in the Eumont Gas Pool and Jalmat Gas Pool, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order suspending the cancellation on January 1, 1958, of the underage accrued to the following gas wells in the Eumont and Jalmat Gas Pools:

Texas Company Riddel Well No. 2, NE/4 NE/4 Section 12, Township 21 South, Range 36 East;

Texas Company State of New Mexico "B" (NCT-2) Well No. 3, NW/4 NW/4 Section 13, Township 23 South, Range 36 East;

all in Lea County, New Mexico.

CASE 1362: Application of Schermerhorn Oil Corporation for an order suspending the cancellation of underage accrued to one well in the Eumont Gas Pool, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order suspending the cancellation on January 1, 1958, of the underage accrued to the following named gas well in the Eumont Gas Pool:

Schermerhorn Oil Corporation Gulf-State No. 1 Well, SE/4 SW/4 Section 31, Township 18 South, Range 37 East,

Lea County, New Mexico.

CASE 1363: Application of J. C. Watson Drilling Company for an order authorizing the use of vacuum pumps on certain wells in the Roberts Pool in Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order authorizing the use of vacuum pumps on its Trimble No. 1 Well located in the NE/4 NE/4 Section 11, Township 17 South, Range 32 East, and its Trimble No. 2 Well located in the SE/4 NE/4 of said Section 11, in the Roberts Pool, Lea County, New Mexico.

CASE 1364: Application of Cities Service Oil Company for an oil-oil dual completion in the Vacuum Pool and Vacuum-Seven Rivers Pool in Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order authorizing the dual completion of its State "K" No. 2 Well located 1980 feet from the North line and 660 feet from the East line of Section 27, Township 17 South, Range 35 East, Lea County, New Mexico, in such a manner as to permit the production of oil from the Vacuum Pool through one inch tubing and oil from the Vacuum-Seven Rivers Pool through two inch tubing.

CASE 1365: Application of Cabot Carbon Company for an oil-oil dual completion in the King-Devonian Pool and King-Wolfcamp Pool in Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order authorizing the dual completion of its H. L. Lowe "B" Well No. 1, located 467 feet from the South line and 850 feet from the East line of Section 26, Township 13 South, Range 37 East, Lea County, New Mexico, in such a manner as to permit the production of oil from both the King-Devonian Pool and King-Wolfcamp Pool through parallel strings of 1½ inch tubing.

CASE 1366: Application of Signal Oil and Gas Company for an oil-gas dual completion in the Skaggs Pool and an undesignated Drinkard gas pool in Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order authorizing the dual completion of its Fred Turner No. 1 Well located 660 feet from the South line and 530 feet from the East line of Section 6, Township 20 South, Range 38 East, Lea County, New Mexico, in such a manner as to permit the production of oil from the Skaggs Pool and gas from an undesignated Drinkard gas pool through parallel strings of tubing.

CASE 1367: Application of Felmont Oil Corporation for approval of its Etcheverry Unit Agreement in Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order approving its Etcheverry Unit Agreement embracing 1,920 acres, more or less, of State of New Mexico lands consisting of S/2 Section 32, S/2 Section 33, Township 14 South, Range 34 East, and all of Sections 4 and 5, Township 15 South, Range 34 East, Lea County, New Mexico.

CASE 1368: Application of Ambassador Oil Corporation for an order granting approval of applicant's proposed pilot water flood project in the Square Lake Pool in Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of its proposed pilot water flood project for the purpose of secondary recovery in which water will be injected into the Grayburg and San Andres formations through six injection wells located in the SW/4 NW/4, SW/4 SW/4, NE/4 SW/4, and SW/4 SE/4 of Section 29, and NE/4 SE/4 of Section 30, and the NE/4 NW/4 of Section 32, Township 16 South, Range 31 East, Square Lake Pool, Eddy County, New Mexico.

ir/

NEW MEXICO
OIL CONSERVATION COMMISSION
P. O. Box 871
Santa Fe, New Mexico

Date November 22, 1957

Cities Service Oil Company
P.O. Box 97
Hobbs, New Mexico

Gentlemen:

Your application for dual completion of your State K No. 1 _____ _____ _____ _____ _____ _____ dated November 6, 1957 has been received, and has been tentatively scheduled for hearing before an Examiner _____ on January 7, 1958.

A copy of the docket will be forwarded to you as soon as the matter is advertised.

Very truly yours,

A. L. Porter, Jr.

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

ga

ROSS MARTIN CO. TULSA 7, OKLAHOMA

SCALE 8 IN = 1 MI / ONE-SECTION PLAT

SECTION TOWNSHIP 17S RANGE 35E COUNTY Lea STATE New Mexico

21

Phillips Chem. 5 ● State

Shell 1-5 ● State

Amerada VA 5 ● State

22

Magnolia "P" 1 ● 2 ● State

23

Penrose, et al 2 ● 1 ● State

Phillips 6 ● State

Phillips 9 ● State

Drlg. & Expl. Co. 1 ● 2 ● State

Shell "N" 1 ● 3 ● State

Phillips 15 ● "Santa Fe" 2 ●

Std. of Texas 1 ● 4 ● 3 ● 2 ● "L" State

Cities Service 3 ● 4 ● 1 ● 2 ● "K" State

Phillips 43 ● 41 ● 30 ● 31 ● "Santa Fe"

28

Humble 11 ● 3 ● "K" 10 ● 1 ● State

27

Std. of Texas 4 ● 1 ● Phillips 30 ● 7 ● State

2 ● 3 ● 5 ● 2 ● State

Shell 1 ● "V" 2 ● State

26

Phillips 22 ● State

Phillips 11 ● State

Phillips 23 ● 17 ● State

Phillips 32 ● 21 ● State

Chio 3 ● 1 ● State

33

Magnolia 2 ● 6 ● 5 ● 1 ● "M" 7 ● 3 ● 8 ● 4 ● State

34

Phillips 18 ● 34 ● 44 ● 27 ● State

Phillips 47 ● 40 ● State

35

8 ● Vacuum - ~~Seven Rivers~~ Yates

6 ● Vacuum - San Andres

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT No. A
CASE 1364

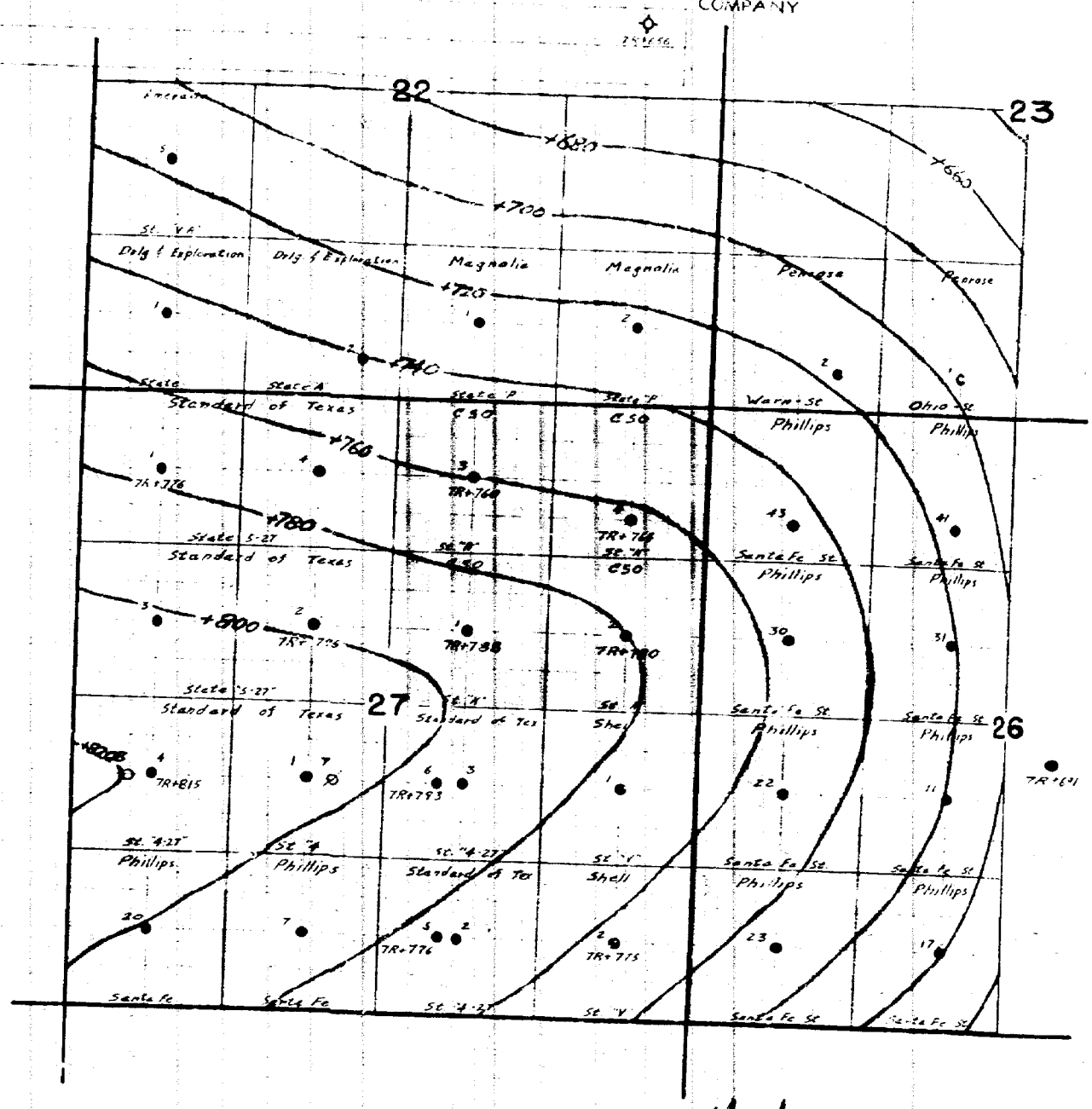
EXHIBIT A

894 FORM NAVTRAN CO. TULSA, OKLAHOMA TOWNSHIP PLAT SCALE 1 IN. = 1 MI.

TOWNSHIP 17 S RANGE 35 E COUNTY LEA STATE NEW MEXICO

REMARKS

COMPANY

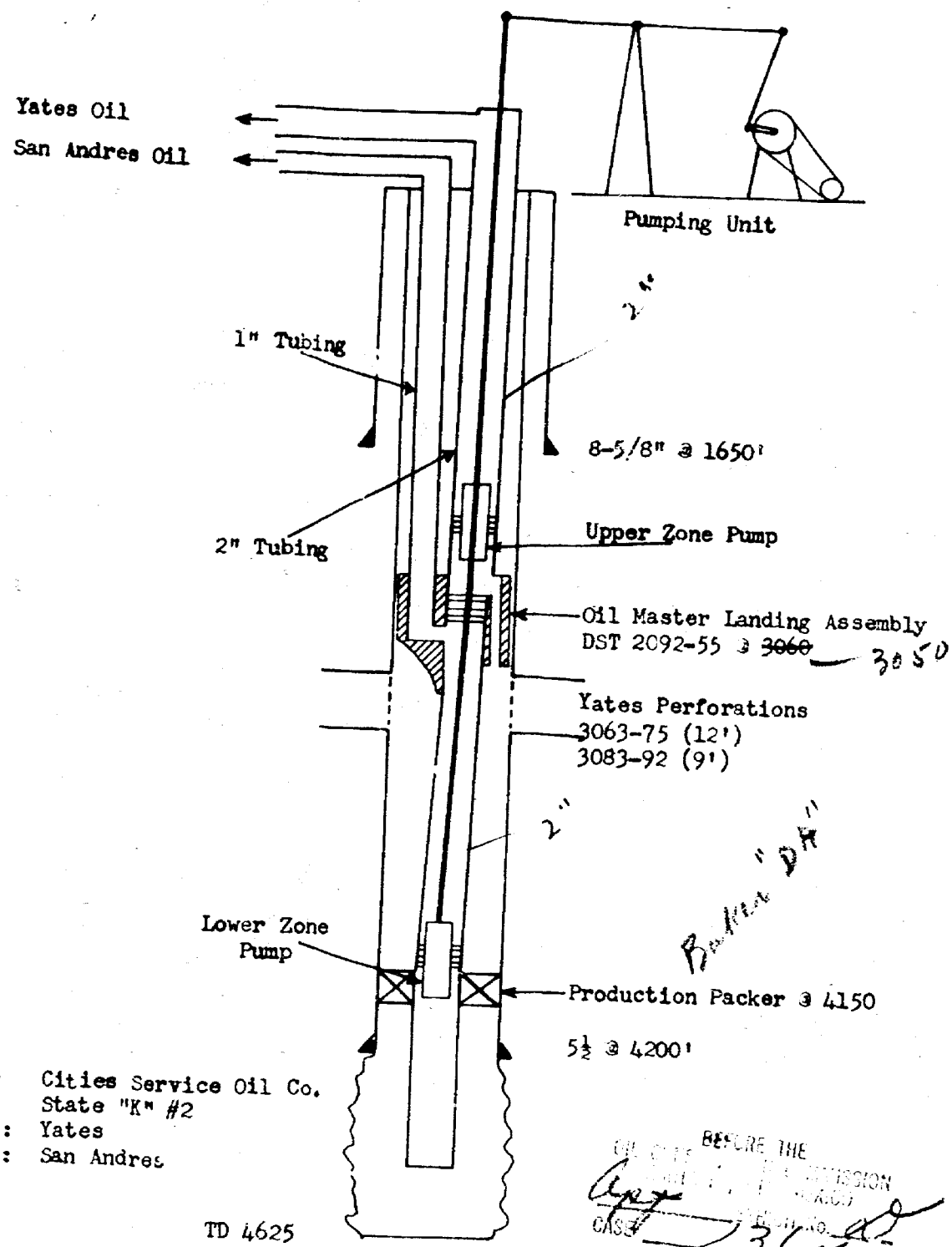


CONTOURED ON TOP OF (SEVEN RIVERS)
C.I. = 20'
DECEMBER 13, 1957

BEFORE THE OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
CASE 1224 EXHIBIT NO. 3

EXHIBIT B

DIAGRAMATIC SKETCH OF OIL-OIL
COMPLETION



Company: Cities Service Oil Co.
Well: State "K" #2
Oil Zone: Yates
Oil Zone: San Andres

BEFORE THE
CASE # 2366

EXHIBIT D

Estimated Cost of Drilling and Completing

New Well to Seven Rivers Zone in

Vacuum Seven Rivers Pool

Level Location	$ 500
Drill 3250' @ $3.50/ft.	11380
Day Work @ $600/day - 4 days	2400
Mud Supplies	3000
Cement and Cementing Expense	3500
Float Equipment and Centralizers	515
390' of 8 5/8" OD Casing @ $2.78/ft.	1083
3250' of 5½" OD Casing @ $1.63/ft.	5300
3200' of 2 3/8" OD Tubing @ $0.60/ft.	1920
Acidizing - 6000 gal.	1800
Perforating	668
Logging - GN & N	423
Well Head Equipment	750
Sucker Rods - 3200' of 5/8" @ $0.36/ft.	1152
Rod Pump	275
Pumping Unit and Installation	3400
Flow Line and Tank Battery	7500
Electric Motor Equipment and Installation	750
Trucking Expense	500
Miscellaneous Material	500
Total	$47,336

EXHIBIT F

Estimated Cost of Dual Completing Seven

Rivers Zone with Grayburg Zone In

State M No. 2, Vacuum Pool

Pulling Unit	$ 1153
Logging - GN & N	814
Hot Oil Service	90
Move in Workover Unit	800
Workover Unit @ $580/day - 5 days	2900
Mud Supplies	1250
Rental Tools	560
Bridge Plug & Setting Charge	417
Cement Retainer & Setting Charge	417
200 sacks Cement @ $1.75/sx	350
Cementing Service	250
2 - 4 3/4" Rock Bits	180
Perforating for Cementing	490
Perforating Seven Rivers	688
Acidizing - 6000 gal.	1800
Packer & Setting Charge	905
Dual Well Head Equipment	650
Dual Pumping Equipment	1800
3350' of 1" Regular Tubing @ $55.61/100'	1863
Plastic Coat 3350' of 1" Reg. Tbg. @ $0.2736/ft.	917
Flow Line & Tank Battery	7500
Trucking Expense	500
Miscellaneous Material	400
Total	$ 26,694

Comparison of Single Completion

Versus Dual Completion

State "K" No. 2

	Single	Dual
Gross Recoverable Oil - Bbls.	35,000	35,000
Net Recoverable Oil - Bbls.	30,750	30,750
Gross Earnings at $2.86/Net Bbl.	$87,945	$87,945
Operating Expense - $0.50/Net Bbl.	15,375	
" " - $0.60/Net Bbl.		18,450
Tax Expense at $0.16/Net Bbl.	4,920	4,920
Net Earnings	67,650	64,575
Development Expense	- 47,336	- 26,694
Net Profit	30,154	37,881
Payout	143%	242%

+ 20,314

Calculation of Gross Recoverable Oil

Average Stock Tank Oil in Place - Bbls.	440
Net Pay in State K #2 - Feet	10
Area Drained by State K #2 - Acres	40
Estimated Primary Recovery	20%

Recoverable Oil - Bbls. = 440 x 10 x 40 x .20 = 35,000

EXHIBIT H

CITIES SERVICE OIL COMPANY

BOX 97

HOBBS, NEW MEXICO

January 13, 1958

Oil Conservation Commission
State of New Mexico
P. O. Box 871
Santa Fe, New Mexico

Attn: Mr. Daniel S. Nutter

Gentlemen:

Attached are four corrected copies of Exhibit "H", Case No. 1364, which was heard January 7, 1958.

If additional information or exhibits are needed, please call on me.

Very truly yours,

E. F. Motter
District Engineer

EFM/gb
Attach.

Comparison of Single Completion

Versus Dual Completion

State "K" No. 2

	Single	Dual
Gross Recoverable Oil - Bbls.	35,000	35,000
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Net Earnings	67,650 ✓	64,575 ✓
Development Expense	47,336	26,694
Net Profit	20,314 ✓	37,881 ✓
Payout	143%	242%

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Recoverable Oil - Bbls. = 440 x 10 x 40 x .20 = 35,000

EXHIBIT H