CASE 3734: Application of GETTY OIL CO. FOR DOWNHOLE COMMINGLING, LEA COUNTY, NEW MEXICO

Case No.

3734

Application, Transcript,
Small Exhibits, Etc.

GOVERNOR
DAVID F. CARGO
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
GUYTON B. HAYS
MEMBER

P. O. BOX 2088
SANTA FE

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

March 13, 1968

Re: Case No. 3734
Order No. R-3387
Applicant:
Getty Oil Company

Mr. Richard S. Morris
Montgomery, Federici, Andrews, Hannahs,
and Morris
Attorneys at Law
Santa Fe, New Mexico

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

Carbon copy of drder also sent to:

Hobbs OCC x
Artesia OCC
Aztec OCC
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. 3734
Order No. R-3387

APPLICATION OF GETTY OIL COMPANY
FOR DOWNHOLE COMMINGLING, LEA COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on March 6, 1968, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 13th day of March, 1968, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

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

(2) That the applicant, Getty Oil Company, is the owner and operator of the State "B" Well No. 1, located in Unit H of Section 14, Township 18 South, Range 37 East, NMPM, Lea County, New Mexico.

(3) That said well is now completed as a low marginal pumping well in the Hobbs Grayburg-San Andres Pool with perforations from 4158 feet to 4168 feet.

(4) That prior to completion in the Hobbs Grayburg-San Andres Pool there was low marginal production from the Bowers-Seven Rivers Pool through perforations from 3345 feet to 3374 feet.

(5) That the applicant proposes to produce and to commingle in the well-bore the low marginal production from the aforesaid pools.

(6) That the Hobbs Grayburg-San Andres zone in the subject well, if produced separately to depletion, is at or near the end of its economic life.

(7) That the proposed commingling will substantially extend the productive life of the Hobbs Grayburg-San Andres Pool in the subject well.

(8) That the reservoir characteristics of each of the two zones are such that underground waste would not be caused by the proposed commingling in the well-bore.

(9) That the proposed commingling will result in the recovery of additional oil from both of the subject pools, thereby preventing waste, and will not violate correlative rights.

(10) That production tests should be conducted, prior to commingling, to determine the production from each zone.

IT IS THEREFORE ORDERED:

(1) That the applicant, Getty Oil Company, is hereby authorized to complete its State "B" Well No. 1, located in Unit H of Section 14, Township 18 South, Range 37 East, NMPM, Lea County, New Mexico, in such a manner as to produce oil from the Bowers-Seven Rivers Pool through perforations from 3345 feet to 3374 feet and from the Hobbs Grayburg-San Andres Pool through perforations from 4158 feet to 4168 feet, commingling the production from each of said zones in the well-bore;

PROVIDED HOWEVER, that the applicant shall conduct a 24-hour production test, prior to commingling, of the Hobbs Grayburg-San Andres Pool; a 24-hour production test, subsequent to commingling, of the combined production of the subject zones; and that future production shall be allocated to the Bowers-Seven Rivers and Hobbs Grayburg-San Andres zones of the subject well in the proportion that the production from each zone bears to the combined production from both zones until further order of the Commission;

PROVIDED FURTHER, that commingling in the well-bore shall continue only so long as the commingled producing capacity does not exceed the top unit allowable for either of the zones in the subject well.

(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.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

DAVID F. CARGO, Chairman

GUYTON B. HAYS, Member

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

esr/

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BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
March 6, 1968

IN THE MATTER OF:

Application of Getty Oil Company for downhole commingling, Lea County, New Mexico.

Case No. 3734

BEFORE: Elvis A. Utz, Examiner.

TRANSCRIPT OF HEARING

MR. UTZ: The hearing will come to order, please. The first case on the docket will be 3734.

MR. HATCH: Case 3734. Application of Getty Oil Company for downhole commingling, Lea County, New Mexico.

MR. MORRIS: I am Dick Morris of Montgomery, Federici, Andrews, Hannahs and Morris, Santa Fe, appearing on behalf of the Applicant, Getty Oil Company. I have one witness, Mr. Harold Vest, and ask that he be sworn.

MR. UTZ: Let the record show that other appearances were requested and there were none.

(Witness sworn)

(Whereupon, Applicant's Exhibits 1 through 14 were marked for identification).

HAROLD VEST

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

DIRECT EXAMINATION

BY MR. MORRIS:

Q Mr. Vest, please state your name, where you reside, by whom you are employed and in what capacity.

A My name is Harold Vest, I'm employed by Getty Oil Company, which just recently changed names from Tidewater Oil Company. I have been employed by them since 1956 and I

worked in Houston, East Texas, Midland and now Hobbs. I'm the area engineer at Hobbs.

Q Have you previously testified before the Commission or one of its examiners?

A No, sir, I have not.

Q Do you have a degree in engineering?

A Yes, sir.

Q From what institution?

A University of Houston.

Q What degree do you hold?

A Bachelor of Science in petroleum engineering.

Q Upon graduation from the University of Houston, did you immediately become employed by Getty Oil Company, then Tidewater Oil Company?

A Yes, sir.

Q Would you just go through in general where your area of experience has been and what the nature of your duties have been since graduating from school?

A Well, I initially went to work in Houston for a short period of time, I believe it was about three months, and I was transferred to Kilgore, Texas and worked there for four years from the initial engineering trainee on up, doing regular engineering work, and then I was transferred to Midland,

Texas in 1960. There I did some reservoir work and continued to do engineering work and stayed there six years. In January of '67 I was transferred to Hobbs as the area engineer in the production department. Primarily still engineering work and involved in completing wells and recompletion work, economics.

MR. MORRIS: Are the witness' qualifications acceptable?

MR. UTZ: Yes, they are.

Q (By Mr. Morris) Mr. Vest, are you familiar with the application of Getty Oil Company in Case 3734?

A Yes, sir.

Q Have you prepared a series of exhibits in support of this application?

A Yes, I have.

Q If you would refer to the first of those exhibits, marked as Exhibit 1, would you state what that exhibit is and what it shows?

A Exhibit 1 shows Getty's State "B" Lease in Lea County. It shows the well in question, Well No. 1, that is the proposal today, and shows the other wells surrounding the lease where they are completed. The circled, green circled wells represent Hobbs Grayburg wells, which I have compiled

some bottomhole pressure history on, and the red circled wells are wells that have been completed in the Bowers zone. The remaining wells shown are Hobbs Grayburg wells.

Q And they are wells that you do not have bottomhole pressure data on, is that right?

A That is true.

Q Would you refer to Exhibit 2 and explain that, please?

A This is a structure map drawn on the Bowers marker and it shows three wells that are in the vicinity that have produced from the Bowers zone.

Q How are these shown?

A These are encircled in red.

Q What does this show about the location of the subject well with respect to the main body of the Bowers Pool?

A The main body of the Bowers Pool is not shown on this plat. It is approximately another mile to the southeast.

Q Does this plat show all of the Bowers completions in the area depicted by this map?

A Yes, sir.

Q So it shows these three wells sort of sitting out on the northeast edge of the main body of the Bowers Pool?

A Yes, sir.

Q And the subject well is the furthest well to the northeast of the pool, is that right?

A Yes, northwest.

Q Excuse me, northwest.

MR. UTZ: You were about to lose me here.

MR. MORRIS: I was looking at his plat upside down.

Q (By Mr. Morris) Would you refer to Exhibit 3 and explain that, please?

A Exhibit No. 3 is also a structure map. This one is drawn on the Grayburg. All the wells shown immediately adjoining the lease are Grayburg producing wells, or have been drilled through the Grayburg. This also shows our Well No. 1 which is now completed as a Grayburg producer.

Q Now, on the subject lease, the Tidewater, now Getty lease, there are two other wells shown. Will you have more complete information to present with respect to those wells as the case develops?

A Yes, sir.

Q Now, again, this plat shows the subject well in the Hobbs field at the extreme northwest edge of the pool, is that correct?

A Yes, sir.

Q Now, concerning the subject well, would you refer

to Exhibits 4 and 5 together; first state what those exhibits are and then proceed to give a history of the subject well from its completion up to the present time.

A Yes, sir. Exhibit 4 is a detailed chronological well history of the State "B" No. 1, and Exhibit 5 is a downhole profile showing perforations, casings and cement in the manner in which it has been processed over the years, and this is the current condition of the well.

On Exhibit 4, Well No. 1 was drilled in 1935. It was drilled to a depth of 4368. At that time the open hole section from 4,019 to 4,368 was tested and it was considered to be non-productive. They swabbed practically all sulphur water at that time. Still in 1935 the well was plugged back inside the casing with cement up to 3867. At that time the Bowers zone from 3345 to 3365 was open to production.

The well was treated in 1947 with a small amount of acid and it was also fracture treated in 1955. The well flowed until mid '55 when a pumping unit was installed. In 1958, several offset wells were being completed in the Grayburg section, and at that time the Bowers production was deferred and we began producing the Grayburg portion.

The cumulative Bowers production to this time, to 1958, was 40,128 barrels. At that time the producing rate

was 7.8 barrels of oil per day, no water, and a gas-oil ratio of 212. The method used was a TIW packer set at 3589 feet to isolate the Bowers zone, and sweet crude oil was pumped into the annulus to fill the annulus to protect this zone.

Q What's a TIW packer?

A It's Texas Ironworks packer. It is a retrievable production type packer.

Q All right.

A The Grayburg zone was produced from open hole section and plugged back several times in 1958 until the present day interval is open from 4158 to 68. After a number of treatments in this zone this well currently produces 2.8 barrels of oil per day from the Grayburg, no water, the gas-oil ratio of 1765.

Q How is the well being operated at this time?

A At this time the well is being pumped with a gas engine and downhole pumping equipment twenty-four hours a day. Cumulative Grayburg production to January 1st, 1968 was 27,711 barrels of oil.

Q Now, is the production information from both of these pools from this well also shown on Exhibit No. 6?

A Yes, sir.

Q Would you point out the features of that exhibit, please?

A Exhibit No. 6 shows production from 1953 to January the 1st, 1968. The red indicates the monthly oil producing rate during this time. The major increase in production in the first half of 1965 was due to the sand frac treatment to the Bowers zone. In early 1958 was the time when the Bowers was shut-in and we recompleted the well in the Grayburg section.

Since that time the well has declined down to the present day, approximately three barrels of oil per day. This Exhibit 6 also shows the gas-oil ratio during the same intervals which is represented by the small circled and dashed line and the percent of water by the light solid lines.

Q Do you have any bottomhole pressure information on this well?

A No, sir.

Q Have you obtained bottomhole pressure information on the nearby wells in this area and do you have that presented in the form of an exhibit?

A Yes, sir. This is shown on Exhibit 7, whereby I went back to the early records and the latest records available from 1940 through 1967 and plotted the pressures from the wells that were available in the area. The pressures

that I show here are the ones that are nearest to our lease. Also shown in the heavy line is the Hobbs field average pressure, the Hobbs Grayburg field, and as time has gone by, each of these wells that are in the immediate area have been below the average field pressure and they have declined to approximately 250 to 500 pounds at the latest pressure readings that were reported.

Q What information do you have with respect to the Bowers field?

A Bowers field, there were some bottomhole pressures run in '47, '48 and '49, however, these are pressures taken from wells in the main body of the field which, of course, as we said previously, is three to four miles to the southeast of our well. I show this on this graph just as a matter of information, that this is all that was ever reported. It declined very rapidly in that particular part, but we do not have any Bowers pressures anywhere near our area we're talking about.

Q Mr. Vest, in view of your knowledge of what the production and the producing rate has been on your well, and comparing the pressure information that you do have on adjoining wells and the location of those wells to your well, do you have an estimate of the range of bottomhole pressure

that you believe exists in each of the zones in this well?

A Well, the Grayburg pressures in our well, we believe is extremely low, because of the low producing rate, and the nearest well with any recent pressure history is the immediate south offset which is the Texas Pacific State VAC No. 1.

MR. UTZ: What is this now?

THE WITNESS: It's the Texas Pacific State --

MR. UTZ: VAC 1?

THE WITNESS: Yes, sir.

MR. UTZ: The south offset?

A Yes, sir. And on the bottomhole pressure graph it is the light solid line that drops the lowest in the pressure. This is the nearest history we have and it has dropped to less than 100 pounds. Now, this was back in 1964. Apparently no pressures have been run since then. So we suspect that our pressure is very low in our well.

Q By Mr. Morris: Now, your Texas production currently is being produced by pump, I believe you said?

A Yes, it is.

Q Has it been on pump for quite sometime?

A Yes, but it was put on the pump -- I believe approximately after being completed in the Grayburg back on

Q At the time the Bowers was shut-in, was it being produced on pump?

A Yes, sir. It had been put on the pump in 1955.

Q Excuse me.

A I was just going to say that we have no pressure history on the Bowers zone in our well. However, it was being pumped at the time, producing approximately eight barrels a day.

MR. UTZ: Do you have any pressures on any of the other Bowers wells in the area?

THE WITNESS: No, sir. Evidently none were reported. I checked all of the records, State records, and there were none reported.

Q (By Mr. Morris) A while ago we mentioned that there were two other wells located on the same lease as this well and we promised to give some additional information on that. What additional information do you have that would be pertinent to this hearing with respect to the other wells on that lease?

A We have one well that is producing on the lease and one well that was drilled as a dry hole, Well No. 2 --

MR. UTZ: Excuse me. Are you now referring to Exhibit No. 8?

A Yes, sir.

Q All right.

A Well No. 2 directly west of Well No. 1 was drilled in 1959 and the Grayburg section was open from 4208 to 4218 and 4226 to 32, and after being treated the well potentialed 37 barrels of oil per day, 17 barrels of water per day, a gas-oil ratio of 340. The well was again treated in 1964 and the cumulative production to January 1968 was 15,518 barrels of oil, 45,681 barrels of water, 8,078 MCF of gas.

Currently the well produces 4.6 barrels of oil per day and 24 barrels of water per day. The gas-oil ratio, 1,063. The other well, the State "B" No. 3, located to the west of No. 2, was drilled in 1960 and it was intended to be a Grayburg producer; however, a number of treatments prove that it would not produce and the well was plugged and abandoned the same year.

Q I see you even tried to frac it with walnut shells and that wouldn't work.

A Yes, sir.

Q Turning to Exhibit 9, does that reflect data on some of the other wells on adjoining leases to the subject well?

A Yes, sir. This refers to the other two Bowers producers that we show on Exhibit 2, which are the Amerada Hardin No. 4, located one and a half miles southeast of our No. 1 well. This well was completed in 1947 in the Bowers Pool, and pumping equipment was installed and the well produced a cumulative of 16,695 barrels of oil until being temporarily abandoned in December of last year, 1967.

The second well, the Shell State "F" No. 1, located approximately 3600 feet due south of our No. 1 well, also shown in red on Exhibit 2, was recompleted from the Hobbs to the Bowers Pool in 1948. Initially it was a Grayburg producer until 1941; to December 1941 the cumulative Hobbs production was 15,023 barrels. I am assuming here that this well did not produce during this period from 1941 to 48, but in 1948 it was recompleted in the Bowers pay and from 1948 to 1956 the Bowers produced 3723 barrels, and at that time the Bowers zone was shut-in and the Yates zone was attempted; however, unsuccessfully. The well was then in 1957 plugged and abandoned.

Q Do you have any additional information with respect to the Bowers and the Hobbs Pools that can be presented?

A Exhibit 10 reflects some history on the Hobbs and

Bowers Pools. The Hobbs Pool was discovered in 1929, this is the Grayburg part, and the pay averages approximately 50 millidarcies permeability, 15 percent porosity and 15 percent water saturation. The oil gravity averages 34 degrees API, and the initial field pressure was 1525 pounds. The drive mechanism here is considered to be water drive.

The Bowers Pool-Lower Seven Rivers was discovered by the Tidewater, now Getty State "B" No. 1 subject well in 1935. The pay averages thirty-six and a half millidarcies permeability, 11 percent porosity and 35 percent water saturation. Oil gravity averages 42 degrees API. The initial field pressure was 1918 pounds. The mechanism is considered to be a solution gas drive reservoir.

I spoke to two of the pipeline companies in Hobbs to determine how the crude is being transported, and they said that the Hobbs and Bowers crudes are being transported together and they are considered sour type of crude.

Q In other words, there's no problem in commingling the oils from these two zones?

A No.

Q Now, Mr. Vest, even though we don't have a wealth of information available from the Bowers Pool because of the few wells that have been completed in this area, still from

what information you have developed here, from your knowledge of the past production from this well, is it your opinion that there are still reserves to be recovered from the Bowers zone in this well?

A Yes, sir.

Q Will you explain why you believe that there are reserves to be recovered here and then give us your estimate of the amount of reserves that there still are in this zone?

A At the time that the Bowers zone was shut-in in 1958, the producing rate was approximately eight barrels of oil per day. Assuming that we have suffered a small amount of pressure decline in the reservoir, we have estimated that this rate now would approximate seventy-five percent of what it was then.

Q Let me interrupt. Is it reasonable to assume that you have suffered some loss in reservoir pressure since 1958?

A Yes, sir. I would think this is a reasonable assumption over a ten-year period, that pressure could be lost from the reservoir in this area.

Q Go ahead.

MR. UTZ: What did you say the pressure was at that time, or did you give it?

A I have no record of the pressure at that time. I have estimated that today the initial producing rate would approximate 5.9 barrels of oil per day from the Bowers zone. We are currently producing 2.8 barrels of oil per day from the Grayburg zone. I have estimated that if the two zones are commingled, that the composite rate of the two zones would be 8.7 barrels of oil per day, and estimating the decline which appears to be about ten percent per year back when the well was producing in the Bowers zone, I use that same decline rate starting in 1968, and by using that, by commingling both zones, the estimated life would be fourteen years and the reserves would be 23,200 barrels. This would take you to an economic limit of two barrels of oil per day.

Q (By Mr. Morris) Now you are talking about both zones combined, is that correct?

A Yes, sir.

Q Now you are also referring to your Exhibit 11, are you not?

A Yes, sir.

Q Looking at the zones individually, now, with respect to the Bowers, you said that you expect an initial producing rate of 5.9 barrels per day, that's based on, as I understand you, the assumption that the producing rate is

going to be somewhat less than the 7.8 barrels per day that you were experiencing in 1958 at the time you shut the Bowers zone in temporarily, is that right?

A Yes, sir. We didn't think that it would be, that the zone having been shut-in would have declined from 1957 to 1968 to approximately three barrels of oil per day, which is what it would have done had it continued to follow the same decline rate. We realize that there probably would have been some decline in pressure, this is the reason that we assumed that we would get a little better than what it would have done by declining all those years.

Q With respect to the Hobbs zone, your producing rate now is 2.8 barrels per day?

A Yes, sir.

Q If you were to continue to produce this zone individually, what would be the cutoff level of production?

A The economics limit, based on the current operating expense, would be about two barrels of oil per day, and at the established decline rate this would be approximately three more years' life before we would be forced to abandon the well due to economic reasons.

Q Now, if the zones can be commingled, then the combined production could be carried on down to an economic

limit of two barrels per day, is that correct?

A Yes, sir, we have anticipated this.

Q And would this enable you to produce the Hobbs zone for a longer period of time than the three-year life that you are presently estimating for it by way of a single producing well, single zone producer?

A Yes, sir. Normally we would have to shut the well in at two barrels of oil per day; however, if we commingle the two zones we will be able to continue to produce the Hobbs portion during the same time that we would be producing the Bowers zone, thus extending the life of the Hobbs Grayburg zone, we could approximate less than one barrel of oil per day until the time that we would reach the two barrels per day from both zones. We do not anticipate any exhorbitant operating expenses during this time.

Q What alternatives are available to you, or have you considered, in order to recover these additional reserves from the Hobbs zone?

A The Bowers?

Q Well, from both of the zones.

A Yes, sir. Exhibit 12, well, to begin with, the one alternative would be to drill another well to the Bowers zone; however, the cost of this could not support, I mean

your reserves in the Bowers could not support drilling a new well.

Q I think it's obvious, but just as an estimate, what would it cost to drill a new well to either one of these zones?

A The minimum price cost would approximately be $45,000.00 as a single zone completion.

Q As another alternative, would it be possible for you to re-enter either of the other two wells on the same lease?

A It would be costly and a very high risk to re-enter Well No. 3, which was the dry hole.

Q That well has already been plugged?

A It has been plugged and abandoned, yes, sir. Well No. 2, we are getting further down dip from this productive area that we know of in Well No. 1, so it would be rather risky there to try to spend money attempting a completion in the Bowers zone.

Q Your No. 2 is still producing from the Hobbs zone, is it not?

A Yes, sir, it is.

Q So you would have the same problem there as you have in the subject well?

A Yes, sir.

Q Have you considered the dual completion of your No. 1 well?

A Yes, sir. On Exhibit 12 we have itemized the cost of dualing the existing well to take in the Bowers interval. Of course, this would require two strings of tubing, the necessary packer, parallel anchor, tubing head and additional pumping unit and equipment, and considering the salvage of the present tubing, packer and rods and head, it would cost approximately $20,000.00, and if we base a pay-out on the Bowers zone added revenue, it would require about eight years if we had no problems in operating the dual pumping system.

Q As your proposed alternative in this hearing, that is downhole commingling of these two zones, have you prepared an exhibit to outline the procedure that you would intend to follow and the cost that would be incurred in this procedure?

A Yes, sir. Exhibit 13 reflects the procedure and the cost. We would intend to pull the rods and repair the pump if necessary and obtain a twenty-four-hour official test from the Hobbs zone as it presently is completed. We would pull the rods and the pump, load the tubing and blow the packer with approximately 25 barrels of oil, release the

TIW packer, pull the rods and pump, recover the 86 barrels of load oil, which is composed of 61 barrels from above the packer and 25 barrels from below. At this time we would obtain another twenty-four-hour official test of the commingled Hobbs and Bowers zones after recovering this load oil. We would plan to allocate the production based on these official tests. The cost of doing this is estimated to be $2100.00. Based on the added Bowers zone revenue, this $2100.00 would be paid out within approximately eight months.

Q If the Commission authorizes you to follow the proposed procedure, would this prevent the premature abandonment of either or both of the zones in this well?

A Yes, sir.

Q Would you explain that a little bit, please?

A The one problem that we have often is casing repair jobs, and here we're looking at a downhole casing of over thirty years, and in the event that this should fail or collapse for any reason, the hole, the cost of repair would likely exceed the revenue from the two zones and this could cause a premature abandonment, so it would be, the best would be to get the oil as soon as possible from that respect.

Q By producing both zones together down to an economic limit of two barrels per day from the combined

sources, are you extending the life of each of the two zones by that procedure?

A Yes, sir. By commingling now rather than waiting three to four years, say, after we have abandoned the Hobbs zone, we can recover this oil in a shorter length of time and shorten the life of the production by both amount of time. Also, we would be able to recover additional oil from the Hobbs Grayburg zone that we would otherwise have to shut off at two barrels a day.

Q Now, do you have an estimate of the additional oil that you would recover from the Hobbs zone, assuming that you continued to produce this zone just as a single zone completion in the Hobbs but then you cut it off at the two-barrel limit and then you went up and produced the Bowers, take that as the first situation, and then the second situation being that you can produce both zones together in a commingled state so that you can take the combined zones down to an economic limit of two barrels per day, what additional amount of oil can be recovered?

A If we continue to produce the Hobbs zone beyond the two barrels per day cutoff that we would normally cut off, let's see, our recovery, at the two-barrel cutoff, is estimated at 2800 barrels. However, if we can continue to produce the

Hobbs zone after this time with the addition of the Bowers production, we can produce it down to an estimated seven-tenths of a barrel a day and recover an additional 4500 barrels of Hobbs oil that we would normally not recover.

Q Is there any danger of the Bowers oil getting into the Grayburg zone, or vice versa? Is there any danger of one zone charging or drowning out the other zone in this well?

A No. It's most likely that any water production would come from the Hobbs zone, which is the lower zone, and it is separated from the Bowers by several hundred feet, and the water that would be produced from the Hobbs would unlikely be able to get into the upper Bowers zones. The intent being to continue to pump the well down, in other words, to recover all fluid that enters the well bore, and your bottomhole pressures are extremely low, that it is unlikely that fluid level would rise above the Bowers zone.

Q Now, no water was being produced from the Bowers at the time it was shut-in in 1958?

A That is true.

Q And no water is being produced from the Hobbs zone at this time?

A That is true, there is just a small trace.

Q But if it should start producing some water, you would estimate that you would be able to handle that all right?

A Yes, sir.

Q I think it's obvious from the figures that you have given, Mr. Vest, but am I correct that the production from both of these zones combined will be much less than a single normal unit allowable?

A Yes, sir. The normal unit allowable is sixty barrels a day for each of the two fields and in our estimate, we would not exceed one allowable, which is our production of about eight barrels a day at the most that we would anticipate getting out.

Q Even if your Bowers zone came back at the same rate at which you shut it in, that is 7.8 barrels a day, your combined production from the two zones would not be over twelve barrels a day, would it?

A I would say that is correct.

Q If you are permitted to commingle the production from the well, how would you attribute the production to each of the two zones?

A To allocate the production?

Q Yes.

A Well, this would have to be done based on official twenty-four-hour test.

Q Would you make a test of each zone before beginning the commingling?

A We would make a test of the Hobbs zone as it presently is completed. Then we would make a test of both zones commingled and allocate on the subtraction or the added production part of that.

Q Being on the edge of the field, on the edge of each of the two pools, with the subject well, do you see any problem concerning protection of correlative rights involved in this application?

A No, sir.

Q As a final exhibit, do you have a log on the subject well to offer?

A Yes. This is Exhibit 14, which is a log of the subject well. It is a gamma ray neutron and it has the tops of the various zones marked on the log and the subsea depths also marked.

Q Mr. Vest, were the Exhibits 1 through 14 prepared by you or under your direction?

A Yes, sir.

MR. MORRIS: We offer Applicant's Exhibits 1

through 14.

MR. UTZ: Without objection, the Exhibits 1 through 14 will be entered into the record of this case.

(Whereupon, Applicant's Exhibits 1 through 14 were offered and admitted in evidence.)

MR. MORRIS: Mr. Examiner, that's all I have at this time on direct examination. At the conclusion of the case I do have some reference I wish to make to some of the other downhole commingling cases that the Commission has considered recently. It may shed some light on this situation.

MR. UTZ: You want to call our attention to what we have done?

MR. MORRIS: Yes.

CROSS EXAMINATION

BY MR. UTZ:

Q Is the Bowers zone a portion of the Seven Rivers or is it considered a separate zone between the Queen and Seven Rivers?

A The geological history indicates that it is of the lower Seven Rivers section.

Q Where is this well in relation to this little Ogallala Pool that they're trying to recover the water out of,

or the oil out of the water?

A I believe that that is back here in the main part of the field.

Q This well is to the northwest of that, then?

A Yes.

Q How far?

A I'm not certain as to the exact limits of this windmill.

Q It only covers 160 to 320 acres?

A It is about four miles out of Hobbs.

Q This well is four miles out of Hobbs?

A No. This Ogallala and this, I feel pretty sure, is approximately four miles on beyond that.

Q Do you have any GOR information from either of these zones of any nearby wells?

A I have some Hobbs annual information on the four offsetting wells. The Continental State "B" 13 No. 5, which is just due, well, it's an east offset to our No. 1, had approximately 4900 gas-oil ratio. It was producing approximately 12 barrels of oil per day. It has recovered approximately 53,000 barrels of the Grayburg. On the same lease, the Continental No. 7, southeast of our No. 1, has gas-oil ratio of approximately 7300 and it is producing eight barrels of

oil per day. It has produced approximately 24,000 barrels.

The south offset, the Texas Pacific "V" No. 1 has a gas-oil ratio of 12,400, and it is producing three barrels of oil per day and has produced approximately 61,000 barrels.

By the way, these three wells do not indicate any water production on the record, and the southwest offset, diagonal offset, the Texas Pacific "V" No. 2 has a gas-oil ratio of approximately 2300, produces nine barrels of oil per day and seven barrels of water per day. It has recovered over 75,000 barrels of oil. These figures are figures as of early 1967 and I didn't get the current up-to-date figures on those wells.

Q Do you have anything on the Bowers now?

A No, sir. Other than the data that is on Exhibit 9. The Amerada Hardin No. 4, which is the one that's one and a half miles to the southeast and it's now temporarily abandoned, produced 16,700 barrels of oil and I do not have a history of the latest gas-oil ratios on it.

Q Do you have any idea at all about how much gas the Bowers will produce?

MR. MORRIS: Mr. Vest, you might refer to -- you had a producing gas-oil ratio at the time that the Bowers was shut-in. Maybe that would be helpful.

A That's on Exhibit 6. The gas-oil ratio was approximately just a little over 200 at that time. The Grayburg and our well began producing at a gas-oil ratio of approximately a thousand to one. The gas-oil ratio had been in the Bowers up as high as 3,000 to one. However, this is probably due to the low producing rate in '53 and '54, low oil rate, and the gas volume was probably fairly consistent there.

Q Now, in regard to pressure, do you have any estimate at all as to what the pressures might be in the Bowers in this area?

A I cannot give a real good estimate. I would approximate two to four hundred pounds.

Q I believe, as I interpreted your estimate on the Hobbs pressures, it was something below 275 pounds?

A I would estimate that the location of our well with respect to these wells that we did have some pressure history on, that it would probably be even lower, being further away than the 200 to 500-pound pressures that are shown on the Exhibit 7. We expect that they are very low bottomhole pressures in both cases. However, we did not run any pressures on our wells.

Q Are you going to use a rod pump on this?

A Yes, sir. We'll use the existing equipment that we have.

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

MR. MORRIS: No, sir.

MR. UTZ: The witness may be excused.

(Witness excused.)

MR. UTZ: Statements?

MR. MORRIS: Mr. Examiner, because I hadn't had a downhole commingling case recently, I inquired into the recent orders that had been entered by the Commission in recent cases. I have seven or eight orders compiled here that I will submit for your information. These orders that I have handed to you are in chronological order beginning with Case No. 3112, Order No. 2824 and Order 2824-A. That was an application by Continental for downhole commingling of an undesignated Gallup oil and Dakota oil zones which was approved on the basis that both zones were marginal.

The next order that I found pertaining to downhole commingling was an application of Charles B. Read in Case No. 3327, Order R-3055, but this doesn't appear to have actually considered the problem of downhole commingling since the order granted the authority to dually complete the well,

separating the zones by packer. So I don't believe that case is applicable.

Case 3389, Order No. R-3060, was application of David Paskin for a downhole commingling of the Bagley Upper and Lower Pennsylvanian zones. This application was denied on the basis that the upper zone produced large quantities of water and it was a danger to the lower zones' reserves.

Next was Case 3395, Order R-3066, application of R. W. Warner, which was application for downhole commingling of undesignated Gallup and Dakota oil zones. This was approved on the basis that the production was marginal from both zones and the combined production was insufficient to justify dual completion of the well.

Next was Case 3432, Order No. R-3099, which was application by Gulf to downhole commingle the Blinebry and Drinkard zones. This application was approved on the basis that both zones were low marginal and the economics were not good enough to dually complete the well.

I might point out in talking about this one that this case, this Gulf case I have just referred to is probably closer on its facts than any of the others to the Getty Oil Company application in this case. The low marginal production that is referred to in the Gulf Oil order from a

review of the records, shows that the Blinebry was producing nine barrels of oil, the Drinkard was producing 37 barrels of oil on the last test, but estimated to produce 18 barrels of oil, so there you had a combined production from the two zones of some 27 barrels of oil a day, which was considered low marginal, which it certainly is, but compared to our case production would be low, low marginal or something even worse.

The next was Case 3447, Order No. R-3117, application of Texas Pacific for commingling the North Bagley-Upper and Middle Pennsylvanian zones. This application was denied on the ground that both zones were top allowable, neither was marginal, and the production was too erratic to justify downhole commingling.

Next was application of Amerada Petroleum in Case No. 3593, Order No. R-3276, in the Monument-Paddock and the Monument-Blinebry. This application was based upon mechanical operating problems rather than upon economics, and the zones do not appear to have been marginal in that case. There was water production in the upper zone and much higher bottomhole pressures in that case to consider than in the present case. It was denied because of the problems in that connection.

The last case that I found was a recent case of Gulf, Case No. 3686, Order No. R-3363, which was a denial

of an application for downhole commingling in the Abo and Penn zones, on the basis that water from the upper zone, the Abo zone, might threaten a drown-out of the lower zone. Certainly it appears from a review of those cases that the cases that have been denied have been either on the basis of non-marginal production and, therefore, no need to commingle, or actual danger from the upper zone producing water in large quantities that would threaten a drown-out of the lower zone.

We don't have either one of those factors present in this application. Conversely, the cases that have been approved have all been on the basis of marginal or low marginal production in situations where there's no minimal danger to either of the producing zones. We feel that the situation we have in our case certainly fits in with the facts of the cases that have been approved by the Commission in the past. So we would certainly believe we have shown justification for approval of our application.

MR. UTZ: Are there any other statements?

MR. HATCH: I have the letter from Amerada Petroleum Corporation dated March 1st, 1968 addressed to the New Mexico Oil Conservation Commission, reference to Case 3734. "Amerada Petroleum Corporation has no objection to the

application of Getty Oil Company for well bore commingling for its State "B" No. 1 in 14, 18 South, 37 East. Amerada is operator of a lease in the same section and has no objection so long as the combined producing capacity of the commingled well is no more than the one allowable that can be assigned." Signed R. L. Hopper.

MR. UTZ: The case will be taken under advisement. We will take a ten-minute break.

I N D E X

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 Hearing before the New Mexico Oil Conservation Commission was reported by me; and that the same is a true and correct record of the said proceedings, to the best of my knowledge, skill and ability.

Witness my Hand and Seal this 12th day of March, 1968.

Ada Dearnley
NOTARY PUBLIC

My Commission Expires:

June 19, 1971.

I [illegible] hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3734, heard by me on March 12, 1968.

[signature], Examiner
New Mexico Oil Conservation Commission

'68 FEB 15 PM 3 [illegible]

BEFORE THE NEW MEXICO OIL CONSERVATION COMMISSION

APPLICATION OF GETTY OIL COMPANY FOR DOWNHOLE COMMINGLING, HOBBS (GRAYBURG-SAN ANDRES) AND BOWERS (SEVEN RIVERS) POOLS, LEA COUNTY, NEW MEXICO.

Case 3734

APPLICATION

Comes now Getty Oil Company by its attorneys and requests the New Mexico Oil Conservation Commission to enter an Order permitting downhole commingling of the oil production from the Hobbs (Grayburg-San Andres) Pool with oil production from the Bowers (Seven Rivers) Pool in its state "B" Well No. 1 located 2,310 feet from the north line and 330 feet from the east line of Section 14, T.18 S., R.37 E., Lea County, New Mexico. In support of its application, Getty Oil Company states:

1. Attached to this application is a plat showing the location of the subject Well and of all other wells in the vicinity of the subject Well that are completed in either the Hobbs (Grayburg-San Andres) or Bowers (Seven Rivers) Pools.

2. Attached to this application is a diagrammatic sketch of the subject Well showing perforations and the manner in which the Well is presently equipped. Applicant proposes to accomplish downnole commingling by removing the TIW packer that is presently set at 3,589 feet.

3. Production from both the Hobbs (Grayburg-San Andres) and Bowers (Seven Rivers) Pools in the subject Well is marginal, and downhole commingling is necessary in order to prevent premature abandonment of production from one or both of these pools.

4. Approval of this application will not impair the

DOCKET MAILED

Date [illegible]

corelative rights of any other operator in either of the pools from which production is sought to be commingled.

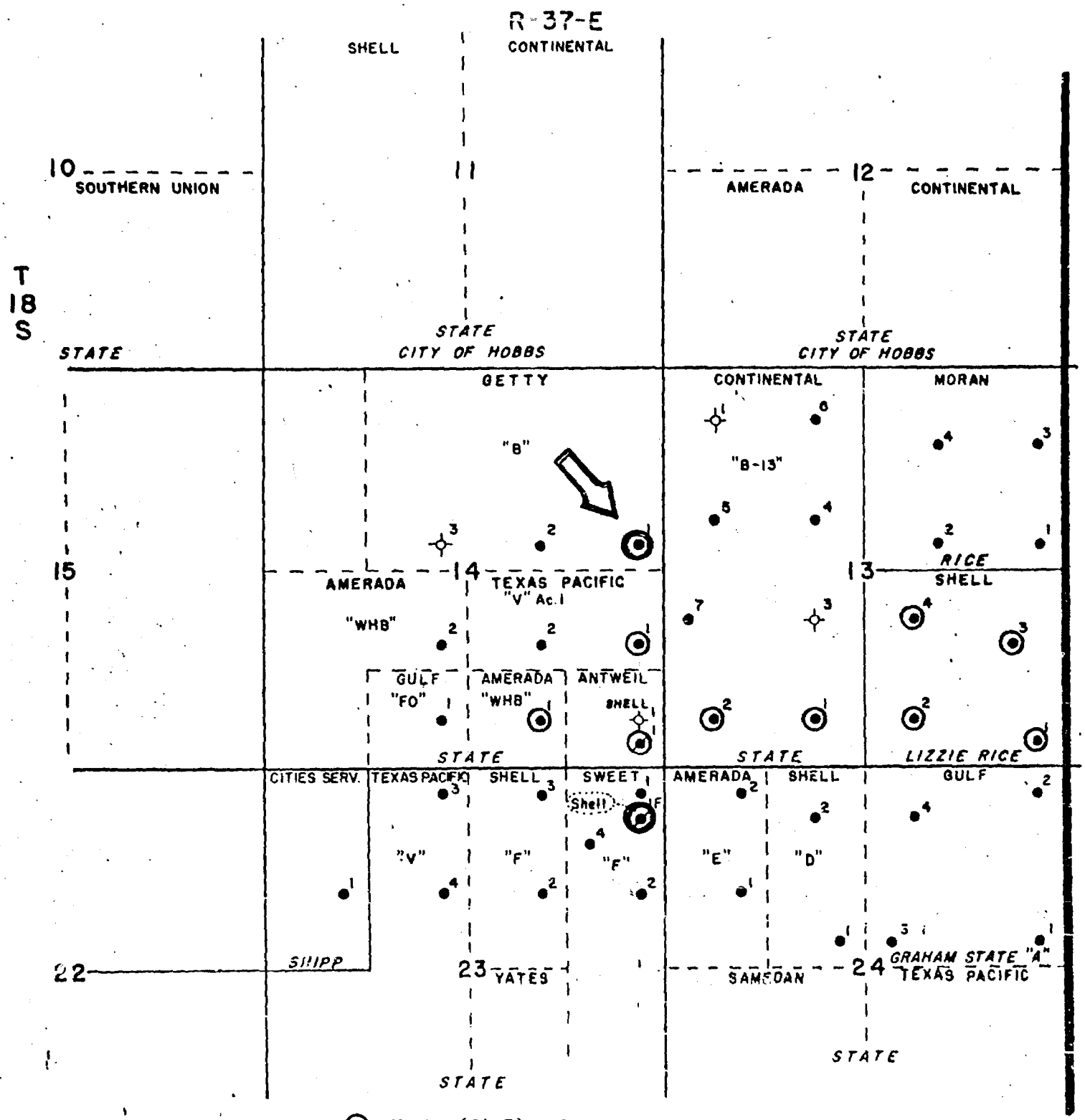
WHEREFORE, Getty Oil Company requests that this application be set for hearing before the Commission or one of its examiners and that the Commission enter its Order approving downhole commingling as herein requested.

MONTGOMERY, FEDERICI, ANDREWS
HANNAHS & MORRIS

By: _____

P. O. Box 2307
Santa Fe, New Mexico 87501
Attorneys for Getty Oil Company

GETTY OIL COMPANY
STATE "B" LEASE
HOBBS & BOWERS POOLS
LEA COUNTY, NEW MEXICO

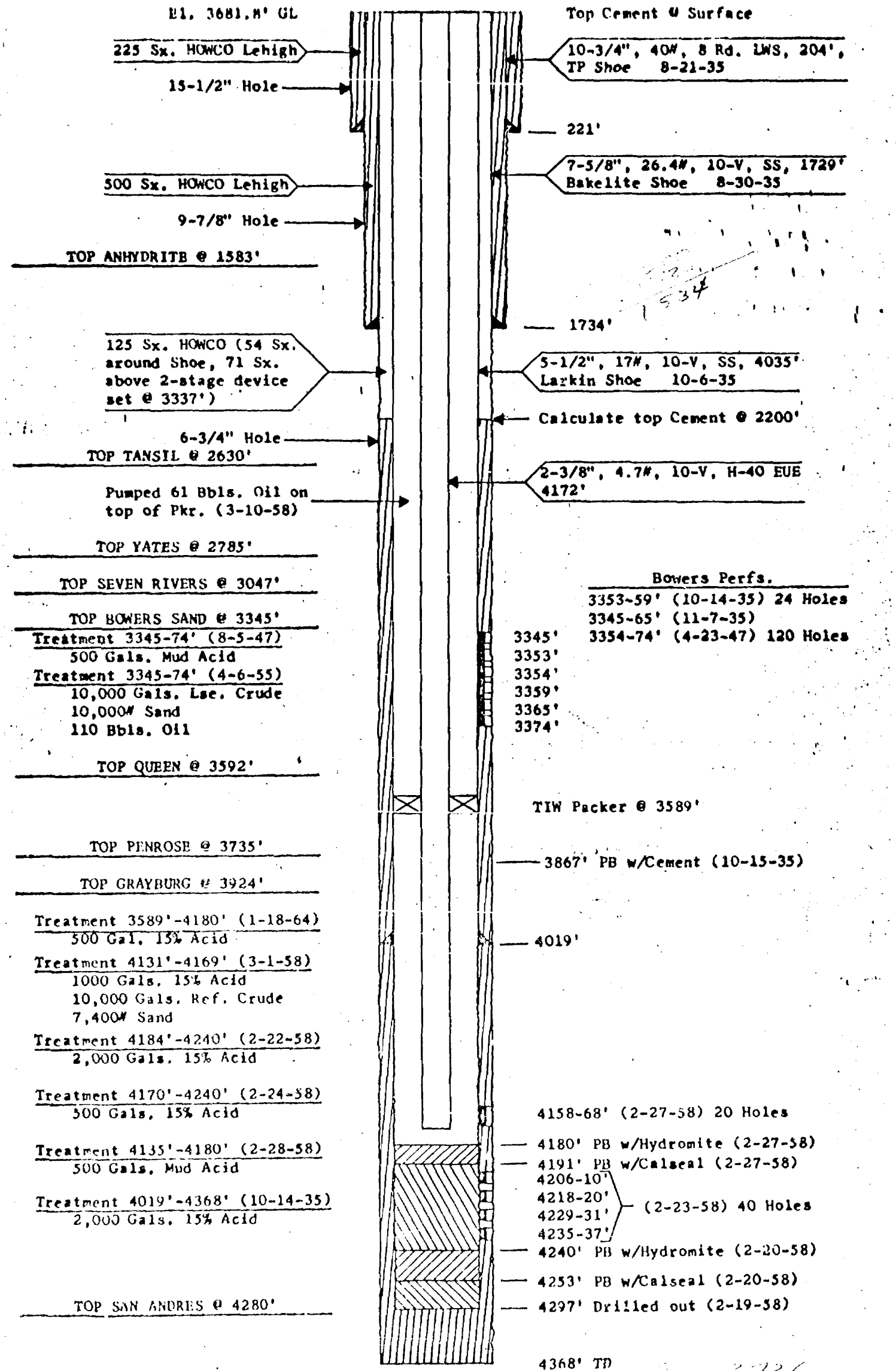


Hobbs (SA-G)-BHP Data

Bowers Completions

Scale - 1" = 1760'

GETTY OIL COMPANY
STATE "B" WELL No. 1 (LEASE No. B-1554)
2310' FNL, 330' FEL Sec. 14, T18S, R37E
LEA COUNTY, NEW MEXICO



Case 3734
Heard 3-7-68
Rec. 3-7-68

Grant Getty permission to
dual complete the Hobbs
Gr. SA Pool and Blinebry-Tubb
Drinkard Pool in their
State 'B' well #1 2310/N-330/E.
14-18S-37E.
Both zones are low Marg.
wells and together it is
estimated they will produce
approx 9 B.O.P.D.
Evidence indicates that
neither zone will will be
harmed.
1. The Hobbs zone shall be
tested for 24 hrs. before
recompletion.
2. After recom. both zones
shall be tested.
3. The daily prod. shall
be reported on the basis of
test ratio as applied to the
total production.

Thos G. Mkj.

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. 3432
Order No. R-3099

APPLICATION OF GULF OIL CORPORATION
FOR DOWN-HOLE COMMINGLING, LEA COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on July 19, 1966, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 5th day of August, 1966, 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, Gulf Oil Corporation, is the owner and operator of the Harry Leonard (NCT-C) Well No. 11, located in Unit K of Section 36, Township 21 South, Range 36 East, NMPM, Lea County, New Mexico.

(3) That said well is now completed as a low marginal pumping well in an undesignated Blinebry pool with perforations from 5783 feet to 5890 feet.

(4) That prior to completion in the undesignated Blinebry pool there was low marginal production from the Arrowhead-Drinkard Pool through perforations from 6514 feet to 6590 feet.

(5) That the applicant proposes to produce and to commingle in the well-bore the marginal oil production from the aforesaid pools.

(6) That the production from neither of said zones, in itself, is sufficient to cover the operating costs of producing the well as a single completion. Further, that the production from both zones,

combined, is insufficient to cover the cost of installing conventional dual completion equipment and the operating cost of the well.

(7) That the reservoir characteristics of each of the two zones are such that underground waste would not be caused by the proposed commingling in the well-bore.

(8) That approval of the proposal will prevent waste in permitting the production of otherwise unrecoverable oil and will not violate correlative rights.

(9) That production tests should be conducted, prior to commingling, to determine the production from each zone.

IT IS THEREFORE ORDERED:

(1) That the applicant, Gulf Oil Corporation, is hereby authorized to complete its Harry Leonard (NCT-C) Well No. 11, located in Unit K of Section 36, Township 21 South, Range 36 East, NMPM, Lea County, New Mexico, in such a manner as to produce oil from an undesignated Blinebry pool through perforations from 5783 feet to 5890 feet and from the Arrowhead-Drinkard Pool through perforations from 6514 feet to 6590 feet, commingling the production from each of said zones in the well-bore;

PROVIDED HOWEVER, that the production of each zone shall be established and future production allocated to the Blinebry and Arrowhead-Drinkard zones of the subject well in the proportion that the production from each zone bears to the combined production from both zones until further order of the Commission;

PROVIDED FURTHER, that commingling in the well-bore shall continue only so long as the commingled production does not exceed the top unit allowable for either of the zones in the subject well.

(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.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

JACK M. CAMPBELL, Chairman

S E A L

esr/

GUYTON B. HAYS, Member

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

Docket No. 7-68

DOCKET: EXAMINER HEARING - WEDNESDAY - MARCH 6, 1968

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

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

CASE 3535: (Reopened)

In the matter of Case No. 3535 being reopened pursuant to the provisions of Order No. R-3206, which order established 80-acre spacing units for the North Vacuum-Lower Wolfcamp Pool, Lea County, New Mexico, for a period of one year. All interested parties may appear and show cause why said pool should not be developed on 40-acre spacing units.

CASE 3734: Application of Getty Oil Company for downhole commingling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to commingle production from the Bowers-Seven Rivers Pool and the Hobbs Grayburg-San Andres Pool in the wellbore of its State "B" Well No. 1 located in Unit H of Section 14, Township 18 South, Range 37 East, Lea County, New Mexico, with the provision that no more than one single allowable will be produced from said well.

AMERADA PETROLEUM CORPORATION

P. O. BOX 2040

TULSA, OKLAHOMA 74102

March 1, 1968

AIR MAIL

New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

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

RE: Case 3734 on 3/6/68

Gentlemen:

Amerada Petroleum Corporation has no objection to the application of Getty Oil Company for well bore commingling for its State "B" #1 in 14-18S-37E. Amerada is operator of a lease in the same section and has no objection so long as the combined producing capacity of the commingled well is no more than the one allowable that can be assigned.

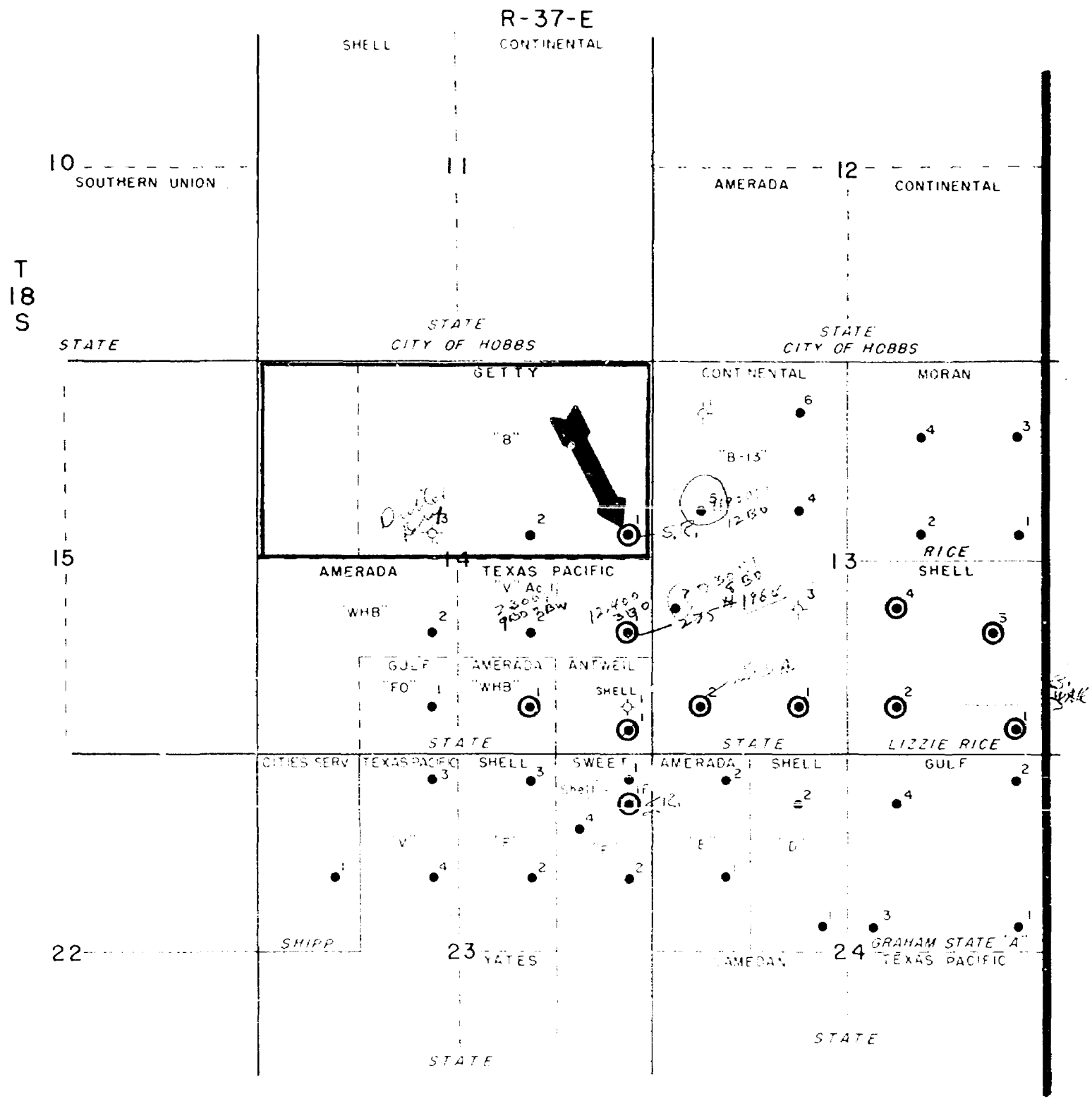
Very truly yours,

R. L. Hocker

RLH:sp

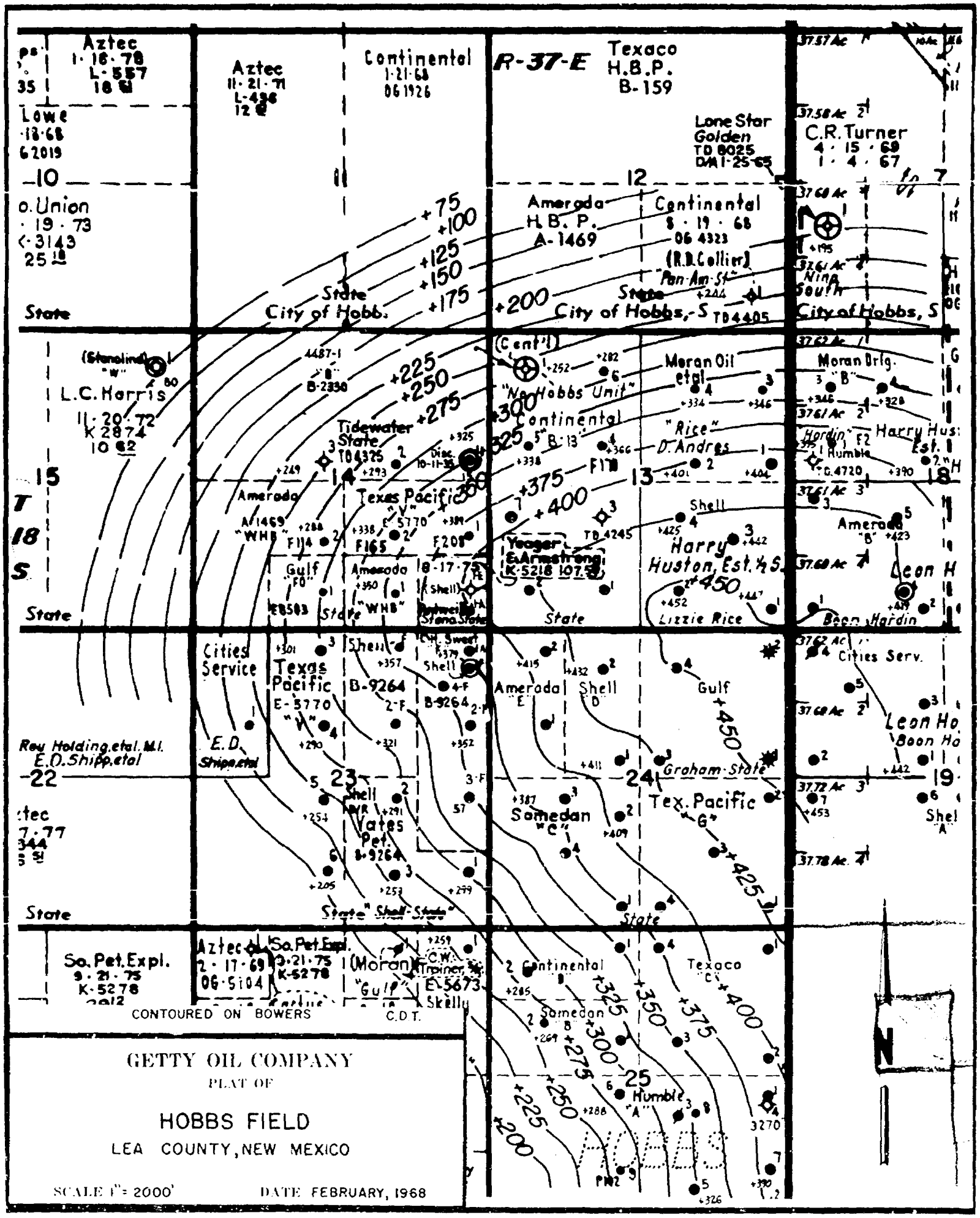
'68 MAR 4 AM 9

GETTY OIL COMPANY
STATE "B" LEASE
HOBBS & BOWERS POOLS
LEA COUNTY, NEW MEXICO



Scale - 1" = 1760'

○ Hobbs (SA-G) BHP Data
○ Bowers Completions



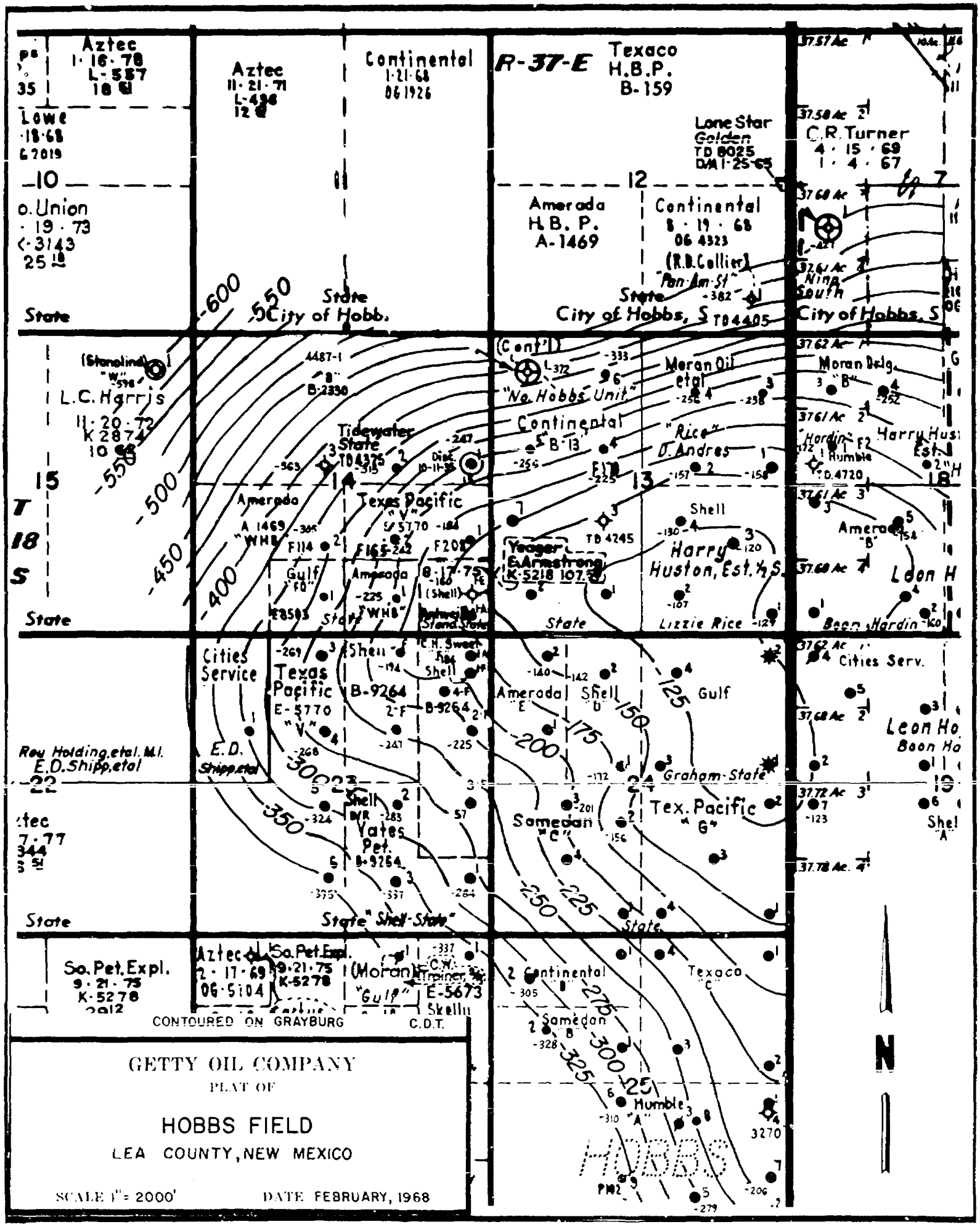
GETTY OIL COMPANY

PLAT OF

HOBBS FIELD

LEA COUNTY, NEW MEXICO

SCALE 1" = 2000' DATE FEBRUARY, 1968



GETTY OIL COMPANY

PLAT OF

HOBBS FIELD

LEA COUNTY, NEW MEXICO

SCALE 1" = 2000' DATE FEBRUARY, 1968

DETAILED CRONOLOGICAL WELL HISTORY

STATE "B" WELL NO. 1 (2310' FNL, 330' FEL, SEC. 14, T18S, R37E)

8-21-35 Spudded by Two States Drilling Co. Cemented 10-3/4" casing in 15-1/2" hole at 221' with 225 sks. Lehigh cement.

8-22-35 Drilled plug, bailed casing dry and allowed to stand undisturbed for two hours. Satisfactory shut-off obtained.

8-30-35 Cemented 7-5/8" 26.40# csg. at 1734' w/500 sks. Lehigh cement. 1200# pressure pumped on csg. before and after drilling plug and allowed to stand undisturbed for 30 minutes. Satisfactory shut-off obtained.

10-6-35 Cemented 5-1/2" OD csg in 6-3/4" hole at 4019' w/two stage cementing device, 54 sks. used around shoe and 71 sks. above two-stage device set at 3337'. Tested 5-1/2" OD csg. w/1200# pressure. Before and after drilling two-stage plug, tested lower plug w/1200# before drilling and 1500# after drilling lower plug. All tests allowed to stand 30 minutes undisturbed. Satisfactory shut-off obtained. Casing head is 7-5/8" x 5-1/2" 5000# Hercules FS and tubing head is 5-1/2" x 2-1/2" Gray, Hinterliter Type #1-HZ.

10-14-35 Swabbed well completely dry, did not have a showing of gas, oil, or water. Treated w/2000 gal. Dowell X Acid, followed up w/32 bbls. oil. Allowed acid to stand 14 hours and ran swab three times, and well flowed the oil load out and died. Swabbed for 40 hours, practically all sulphur water. Pulled tubing and plugged back up in casing to 3867' w/cement and then perforated csg. into Bowers Sand from 3353' to 3359' w/24 holes by Lane Wells. On swab test made 16 bbls. of 41.5 Gravity Oil in 24 hours.

11-7-35 Perforated 5-1/2" casing from 3345-65'

8-30-39 Humble took over oil connection from Shell Pipeline.

4-23-47 Pulled tubing. Steamed paraffin and salt out of tubing. Ran Lane Wells Gamma Ray-Neutron log. Bottomed at 3642'. Loaded hole w/oil and perforated casing from 3354-74' by Lane Wells. Swabbed out oil load, swabbed down to 100' of bottom. Shut well in for 7 days, then swabbed 33.75 bbls. oil w/very little gas. Casing 400# at start and 200# at end of swabbing on 5-13-47.

5-14-47 Swabbed 28.62 bbls. oil. pressure at start 250#. Pressure kicked around. After 16 hour shut down period oil rose from 500' of bottom to 2375' of bottom.

8-5-47 Acidized w/500 gals. Dowell Mud Acid.

4-4-55 Hot oiled tubing.

4-5-55 Pulled tubing and prepared well for sandfrac treatment.

4-6-55 Sandfraced w/10,000 gals. lease crude and 10,000# sand. Flushed w/110 bbls. oil or 20 bbls. in formation. Injection rate 23.2 BPM at 2600 PSI.

4-7-55 Ran tubing.

4-8-55 Swabbed and flowed 335 bbls. of the 500 bbls. of load oil to 4-13-55.

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

4-14-55 Ran pump and rods and moved in portable pumping unit. Pumped rest of load oil.

4-18-55 Potentialed 36.51 BOPD, 2% water, GOR 174.

6-8-55 Install Pumping Equipment (Cabot #CT13PM-18DC Unit with 58" stroke and Type ZC-503 F-M Gas Engine).

12-23-57 Welded braden head between surface and intermediate strings. Installed bleeder lines w/gate valves brought to surface and left open in compliance with memorandum by NMOCC dated November 18, 1957.

2-7-58 Preparing to isolate Bowers zone and recomplete in the Grayburg section. During 1957 several wells in the immediate vicinity were completed in the Grayburg Lime. Among these was Continental's State "B-13" No. 5, East offset, which was completed in June, 1957, and flowed 58 BOPD. Production from the Bowers sand to be deferred because well is equipped with 5-1/2" casing, making dual tubing strings impractical for pumping both zones. The Bowers zone is currently producing at a rate of 7.8 BOPD, no water and a GOR of 212. Cumulative Bowers production amounts to 40,128 bbls. of oil. The Bowers sand is to be protected for future producing operations by loading the casing annulus with sweet crude oil.

2-18-58 Pulled 2" tubing and ran 4-3/4" bit, one 3-1/2" drill collar and 2-1/2" tubing. Washed sand and mud from 3630' to 3867', top of cement plug.

2-19-58 Drilled hard cement plug to 4297' w/exception of soft streak 4156-72'. Circulated hole w/clear water. Pulled 2-1/2" tubing and ran GR-N log.

2-20-58 Dumped 5 sks. Calseal (Fillup 4296-53') and 16 gals. Hydromite (4253-40').

2-22-58 Set Sweet Anchor Packer at 4184' and acidized open hole from 4184' to 4140' w/2000 gals. 15% acid. Max press. 2200#, Min 2000#, rate of 1-1/2 BPM. A pressure of 1600# was held on the annulus, packer held OK, bled off pressure. Swabbed well 3 hours, recovered 73 bbls. acid water and load. No indication of oil. Recovered approximately all load and acid water. SI 14 hours, TP 10#, 800' fluid in hole. Pulled swab, appeared to be acid water, fluid level at 200'.

2-23-58 Loaded hole w/water. Pulled 2-1/2" tubing and Sweet Packer. Welex perforated open hole 4206-10', 4218-20', 4229-31', 4235-37' w/two 4-3/8" Torpedo jets/ft.

2-24-58 Went in hole w/2-1/2" tubing and redressed Sweet Packer. Found bridge at 4230' (10' off bottom) apparently from jets or cement knocked from walls of hole. Spotted acid on formation, set packer at 4170' and acidized w/500 gals. 15% NE acid. Max press. 2250#, min press. 2250#. 5-min SIP 2000#. Continually pumped in annulus holding 1600#. Swabbed approximately 40 bbls. acid water and packer gave way. Ran tubing to bottom to reset pkr. Tubing perfs stopped up. Loaded tubing w/water, could not circulate.

2-25-58 Pulled 2-1/2" tubing and Sweet Packer. Ran tubing back w/Guiberson HW Packer. Tubing at 4217', packer at 3592'. At start fluid 1200' from surface. Swabbed 3-1/2 hours, fluid swabbed down to within 300' of bottom. Swabbed acid water, SI 14 hours, TP 0#, FL 900'.

2-26-58 Pulled 2-1/2" tubing and packer. Rigged up Welex to perforate Grayburg, but could not get to bottom. Ran 2-1/2" tubing with bit.

2-27-58 Pushed rubber to 4225'. Perforated 4158-68' w/20 Welex Torpedo Jets. Hole bridged at 4112'. Ran Midco sand pump and knocked bridge to 4220'. Plugged back 4220-4191' w/6 sacks Calseal and 4191-80' w/12 Gals. Hydromite. Ran 4-1/2" Lynes O.H. Packer and 2-1/2" tubing. Set packer at 4135'.

2-28-58 Spotted 500 gals. mud acid. When pumping in formation at 4600#, formation packer pumped up hole 10'. Pulled pkr. and 2-1/2" tubing and ran O.H. straddle packer on 2-1/2" tubing. Set upper packer at 4131' and lower packer at 4169'.

3-1-58 Treated w/1000 gals. NE acid ahead of 10,000 gals. refined crude and 7400# sand w/max press. 6200#, min. 4800# and final pumping press. of 5300#. Rate was 8.7 BPM overall. ISIP was 2600#, 15 min. 2400#, 20 nours slight vacuum.

3-2-58 Swabbed 8 hours, recovered 75 BLO (325 to go) and lowered FL within 150' from bottom. One hour test had 1050' fluid rise. Good gas blow last pull. SI 15 hours, TP 140#.

3-3-58 Swabbed 18 bbls. first hour. Unseated Lynes packer and pulled 2-1/2" tubing.

3-4-58 Ran 2" tubing w/TIW Packer, 2" x 1-1/2" x 12' Pump and rods.

3-5-58 Put to pumping at 1:00 PM, 50" stroke, 16 SPM, packer swung at 3589'.

3-6-58 Pumped 49 BW and 70 BLO in 24 hours.

3-8-58 Pumped 90 BLO in 23.5 hours. All load oil recovered plus 13 BO.

3-10-58 Pumped 58.76 BO and 4.52 BW in 19 hours. Pulled rods, set TIW packer at 3589'. Pumped 61 BO on top of packer. SI 13-1/2 hours. TP 150#, FL 2400'.

3-11-58 Ran pump, rods, put to pumping.

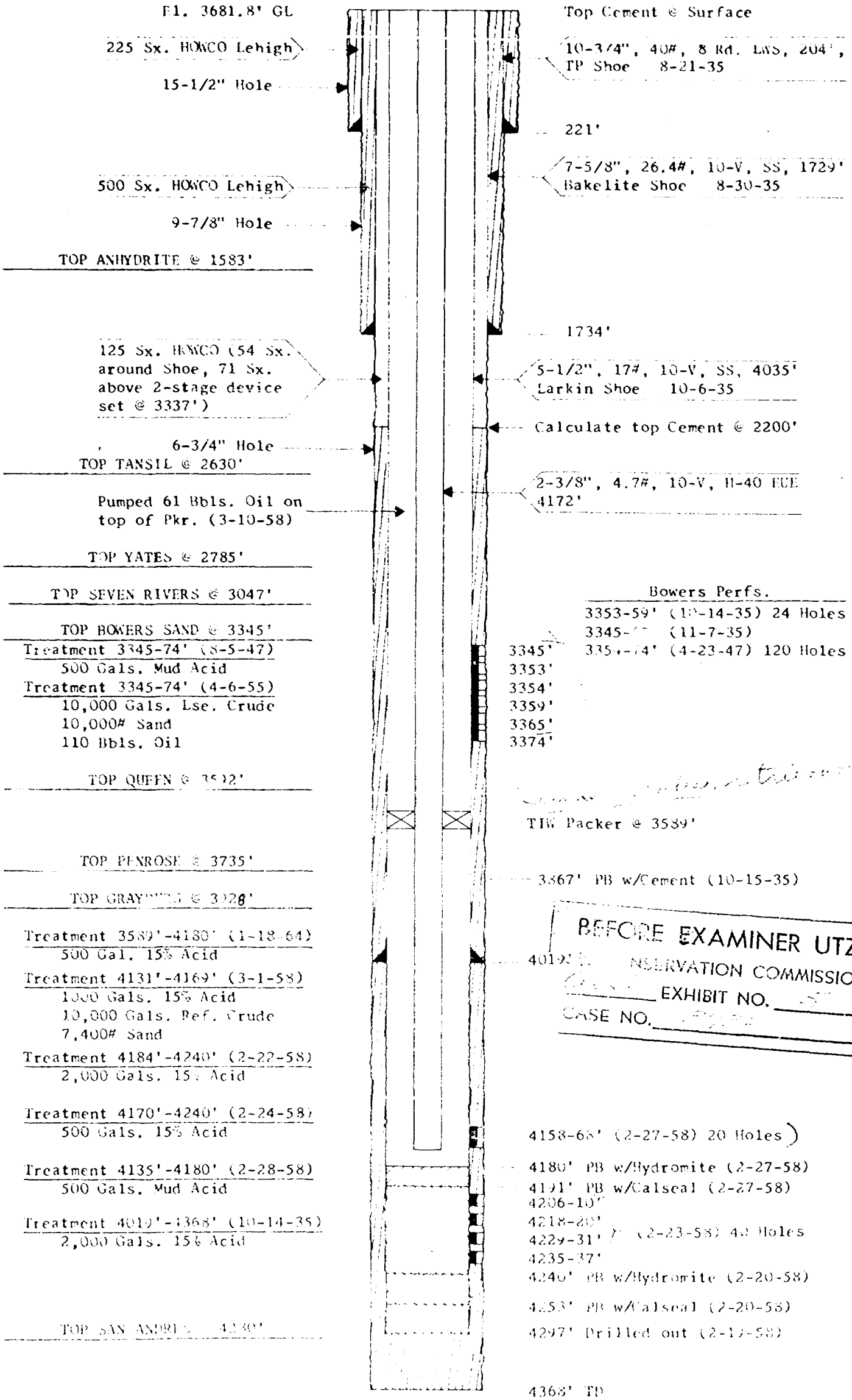
3-14-58 Official Potential Test 45 BO, 48 MCF gas, Gor 1067.

1-18-64 Treated w/500 gal. 15% Cardinal Reg. acid. Max. treating press. 1000#. Avg. rate 1.5 BPM.

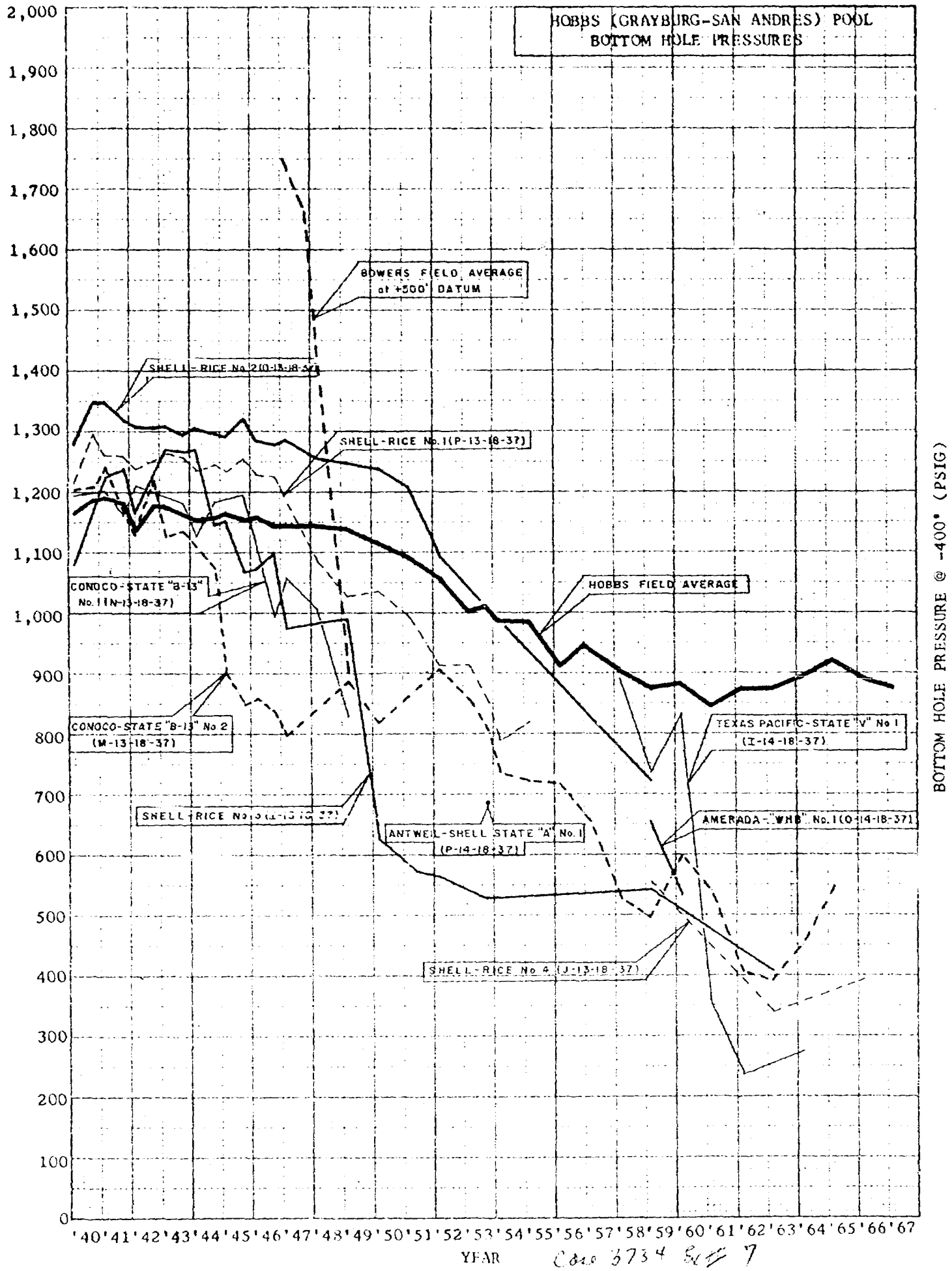
2-14-64 Pumping 7 BOPD prior to treatment. Speeded up from 9 to 11 SPM. in 24 hours pumped 13.78 BO.

1-1-68 Cumulative Grayburg production of 27,711 bbls. of oil. Latest well test is 2.3 BOPD, No BWPD, and a GOR of 1765. Well is being pumped 24 hours per day, 7 days a week with Axelson 2" x 1-1/2" x 12' RWB-C pump on 3/4" rods at 4100'.

GETTY OIL COMPANY
STATE "B" WELL No. 1 (LEASE No. B-1554)
2310' FNL, 330' FEL Sec. 14, T18S, R37E
LEA COUNTY, NEW MEXICO



BEFORE EXAMINER UTZ
NSERVATION COMMISSION
EXHIBIT NO. [illegible]
CASE NO. [illegible]



Case 3734 Ex 7

DATA ON OTHER WELLS ON STATE "B" LEASE

State "B" No. 2 (1650' FEL, 2310' FNL, Sec. 14, T18S, R37E)

This well was drilled to a TD of 4275' on 11-19-59 with 5-1/2" casing set at 4274' and PBTD being 4270'. Grayburg perforations at 4208-18' (20 holes) and 4226-32' (12 holes) were treated on 11-21-59 with 1000 gals 15% acid, 10,000 gals refined crude and 10,000# sand. Pumping potential test on 12-10-59 was 37 BOPD, 17 BWPD and 340 GOR. On 3-3-64, the well, after being treated with 1000 gals 15% acid tested 24 BOPD and 96 BWPD. Cumulative production to 1-1-68 was 15,518 BO, 45,681 BW and 8,078 MCFG. Currently the well produces 4.6 BOPD and 24 BWPD with a GOR of 1063.

State "B" No. 3 (2310' FWL, 2310' FNL, Sec. 14, T18S, R37E)

This well was drilled to a TD of 4325' on 1-1-60 with 5-1/2" casing set at 4324' and PBTD being 4320'. Grayburg perforations at 4260-74' and 4288-94' (40 holes) were treated on 1-5-60 with 1500 gals 15% acid, 10,000 gals refined oil, 10,000# sand and 25 ball sealers. All load fluid was not recovered. On 1-26-60, a bridge plug was set at 4250' and perforations at 4218-32' (28 holes) were treated with 1000 gals 15% acid, 5000 gals. refined oil and 5000# sand. All load fluid was not recovered. On 2-28-60, set retainer at 4170 and squeezed perforations at 4218-32' with cement. Drilled retainer on 2-28-60 and Abrasijet casing at 4219, 4222 4225 and 4227'. Treated with 500 gals 15% acid, 10,000 gals. refined oil, 10,000# sand and 20 bbls. lease crude. Did not recover all load fluid. Perforated 4222'-27' (60 holes) on 5-15-60, Vibro-fraced and treated with 10,000 gals refined oil and 3400# walnut shells. Did not recover all load fluid. Well was plugged and abandoned on 8-23-60.

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 8
CASE NO.

DATA ON NEARBY WELLS IN BOWERS POOL

Amerada - B. Hardin No. 4 (660' FSL, 1900' FWL, Sec. 18, T18S, R38E)

This well, located about 1-1/2 miles southeast of the Getty State "B" No. 1 was completed on 4-16-47 in the Bowers Pool from open hole interval from 3180' to 3270'. After being shot with Nitroglycerin, pumping equipment was installed. No logs are available. The well produced a cummulative of 16,695 barrels of oil until being temporarily abandoned on 12-18-67.

Shell - State "F" No. 1 (660' FNL, 330' FEL, Sec. 23, T18S, R37E)

This well, located 3600' south of the Getty State "B" No. 1, was recompleted from the Hobbs to the Bowers Pool on 9-17-48 from perforated interval 3300'-3350'. Following an acid treatment, the well produced a cummulative of 3723 barrels of oil from the Bowers until 6-6-57 when a recompletion in the Yates was attempted.

Following is a chronological history of this well:

10-26-41	Cemented 8-5/8" csg in anhydrite at 1592' w/525 sacks Incor cmt. Circulated.
10-27-41	Tested csg w/1000# press. for 30 min, OK.
11-15-41	Cemented 4-1/2" csg in Lime at 4099' w/130 sks.
11-18-41	Tested w/1000# for 30 min., OK
11-25-41	TD 4150'. Prod 5 bbls fluid/hr (50% water) PB from 4150 to 4140 w/2 sks cement.
12-4-41	PB from 4140-4122' w/4 sks cement. Swabbed well dry. Approx 2 gal fluid/hr entering hole.
12-8-41 to 12-10-41	Treated w/6000 gal acid in 2 stages. Swabbed rate of 300 bbls/ fluid per day, 50% oil (12-8-41 1000 gal at 4122') (12-10-41 5000 gal at 4122') Cumulative Hobbs oil production of 15,023 bbls.
8-24-48	Recomplete in Bowers Pay - Ran radioactive survey to 4122'. Set BP at 3925'. Set cement plug to 3910'. Test with 1000# for 30 min. Perf 4-1/2" from 3350-3300'. Wash w/500 gal mud acid
9-17-48	Well completed flowing intermittently. 21.56 bbls fluid, 99.9% oil and 1/10% water, 42° Gravity, 223 GOR.
1-1-56	Bowers zone shut in. Cumulative Bowers oil production of 3723 bbls.
6-6-57	Perf w/4 shots at 2575' by Welex (Yates).

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

DATA ON NEARBY WELLS IN BOWERS POOL (Continued)

6-13-57 Perf w/4 15 Gram JSPF 2745-55', 2775-90', 2810-20', 2850-60' (Welex)

6-8-57 to 6-13-57 Cemented 4-1/2 csg w/180 sacks cement. WOC 16 hours. Squeezed perfs 2575' w/500 sacks 6% Gel cement. WOC 24 hours. Drilled cement and test casing w/2000 psi. Bled off at 1/4 BPM. Set packer at 2515 and recemented perfs w/100 sacks Trinity Inferno cement. WOC 16 hours. Drilled cement 2526-90'. Tested 2/1400 psi, OK.

6-10-57 to 6-13-57 Circulated behind 4-1/2" casing from 3300 to 2575'. Pulled tubing, packer and ran 2" tubing. Set Baker CI Retainer at 3250' and cemented w/180 sacks reg. neat cement. Displaced plug to retainer and pulled tubing. WOC 16 hours. Ran tubing and pumped perfs at 4 bbls/min - 1700 psi. Did not circulate. Squeezed perfs 2575' w/500 sacks 6% Gel cement. Maximum and final pressure 1900 psi. Drilled cement retainer and firm cement from 2505 to 2636'. Check top of plug at 3250'. Top of cement at 1895' by temp. survey.

10-15-57 Pulled rods and tubing. Loaded hole w/mud. Ran tubing to 2860'. Spotted 25 sack cement plug 2860-2820'. Pulled tubing. Removed well head connections. Spotted 5 sack cement plug at surface. Erected 4" x 4" marker.
No Production from Yates

DATA ON HOBBS AND BOWERS POOLS

Hobbs (Grayburg-San Andres) Pool

This field was discovered by the Stanolind (Pan American) State "A" Tr. 5 No. 1 on 6-13-28. The "Sandy Section", Grayburg, consists of sandy dolomite with interbedded dolomitic sands and produces on the west and northwest flanks of the field. The "White Lime", San Andres, is the main pay and is a very porous white limestone containing cavernous porosity on the crest of the anticlinal structure. There are two zones of porosity on the crest of the structure and three zones on the flanks. The pay averages 50 md., 15% porosity and 15% water saturation. Oil gravity averages 34° API and the gas has a specific gravity of 1.05 with H_2S content of 1%. The initial field pressure was 1525 psi at -400' and the mechanism is considered to be water drive.

Bowers (Lower Seven Rivers) Pool

This field was discovered by the Tidewater (Getty) State "B" No. 1 on 10-11-35. The Bowers pay is in the lower Seven Rivers formation of Permian Age and consists of two zones which average 8' and 10' respectively and is a fine grained silty sand. Because of the "lens-like" nature of the sands, the better development is on the crest of the anticlinal structure. On the southern end of the high, the pay becomes very dolomitic. The pay averages 36.5 md., 11% porosity and 35% water saturation. Oil gravity averages 42°API and the gas has a rating of 900 BTU. The initial field pressure was 1918 psi at -500' and the mechanism is considered to be solution gas drive.

Both Hobbs and Bowers crudes are considered sour by the pipeline companies, and are being transferred together.

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 10
CASE NO.

VALUE OF RESERVES

STATE "B" WELL NO. 1

Current (Hobbs Zone Only)

Reserves:	2800 Bbls (2440 Bbls. Net)
Prod. Rate:	2.8 BOPD Initial, 2.0 BOPD Final
Life:	3 years at 10% Decline Rate
Net Value:	$1,200 (After Royalty, Taxes and Operating Expense)

Proposed (Hobbs and Bowers Zones Commingled)

Reserves:	23,200 Bbls. (20,300 Bbls. Net)
Prod. Rate:	8.7 BOPD Initial, 2.0 BOPD Final
Life:	14 years at 10% Decline Rate
Net Value:	$31,000 (After Royalty, Taxes and Operating Expense)

29,800 $1.46 BM.
20,400

Additional (Bowers Zone Only)

Reserves:	20,400 Bbls. (17,860 Bbls. Net)
Prod. Rate:	5.9 BOPD Initial, 2.0 BOPD Final
Life:	~~14~~ years
Net Value:	$29,800 (After Royalty, Taxes and Operating Expense)

Basis

Monthly Oper. Expense (Includes Ad Valorem Taxes & Insurance)	$140
Unit Price of Crude	2.87/Bbl.
Production Taxes	0.18/Bbl.
Net Value of Crude (After Prod. Taxes & Royalty)	2.35/Bbl.
Economic Limit	60 Bbls./Mo.
Working Interest	100%
Net Interest	87.5%

8.7
30
261 0

EXAMINED

ESTIMATED COST FOR DUAL COMPLETION

STATE "B" WELL NO. 1

Dual 2-1/16" Tubing Strings (7550')	$ 5,200
Packer, Parallel Anchor & Equipment	800
Dual Tubing Head & Fittings	4,000
Additional Beam Pumping, Base & Equipment	3,800
Gas Engine, Starter & Equipment	2,300
Dual 5/8" Rod Strings (7550')	3,300
Insert Pump, Polish Rod & Connections	400
Pulling Unit	1,300
Tool Rental	400
Miscl. Labor & Materials	300
Total	$21,800
Less Salvage of Tubing Packer, Rods & Head	1,800
Total Cost	$20,000

Based on the added Bowers zone revenue, payout of this cost would require approximately eight years.

PROCEDURE AND ESTIMATED COST FOR DOWNHOLE COMMINGLING

STATE "B" WELL NO. 1

PROCEDURE

(1) Pull rods and pump. Repair pump, if necessary.

(2) Run rods and pump. Obtain official 24-hour test from Hobbs zone.

(3) Pull rods and pump. Load tubing and below packer with approx. 25 bbls. oil.

(4) Pull up to release TIW packer at 3589'.

(5) Run rods and pump. Recover approx. 86 bbls. of load oil (61 bbls from above packer and 25 bbls. from below packer).

(6) Obtain official 24-hour test of commingled Hobbs and Bowers zones.

(7) Allocate production based on official tests.

ESTIMATED COST

Pulling Unit	$1200
Tool Rental	150
Outside Trucking & Labor	300
Company Trucking & Labor	100
Pump Repair & Service	250
5% for Contingencies	100
Total	$2100

Based on the added Bowers zone revenue, payout of this cost would be within eight months.

EXAMINER UTZ
EXHIBIT NO. 1
CASE NO.