CASE 3995: Appli. of CONTINENTAL FOR DOWNHOLE COMMINGLING, LEA COUNTY, NEW MEXICO.

Case Number

3995

Application

Transcripts.

SmaLL Exhibits

ETC.

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
December 11, 1968

EXAMINER HEARING

IN THE MATTER OF:	
Application of Continental Oil Company for downhole commingling, Lea County, New Mexico.	CASE NUMBER 3995

BEFORE:

ELVIS A. UTZ, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: Case 3995.

MR. HATCH: Case 3995, application of Continental Oil Company for downhole commingling, Lea County, New Mexico.

MR. KELLAHIN: Jason Kellahin, of Kellahin and Fox, Santa Fe, New Mexico, appearing for the applicant. I have one witness I would like to have sworn, please.

(Whereupon, Applicant's Exhibits 1-12 were marked for identification.)

(Witness sworn.)

VICTOR T. LYON

called as a witness on behalf of the applicant, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q State your name, please.

A Victor T. Lyon.

Q By whom are you employed?

A Continental Oil Company as Conservation Coordinator, Hobbs Division, located in Hobbs, New Mexico.

Q Have you ever testified before the Oil Conservation Commission, and made your qualifications a matter of record?

A Yes, I have.

MR. KELLAHIN: Are the qualifications of the witness

acceptable?

MR. UTZ: Yes.

Q Mr. Lyon, are you familiar with the application of Continental Oil Company in Case 3995?

A Yes, sir.

Q What is proposed in that application?

A Case 3995 is the application of Continental Oil Company for authority to commingle in the well bore production from the Maljamar-Abo Pool and the Baish-Wolfcamp Pool in its Baish Well Numbers 12 and 13, utilizing dual-flow downhole choke assemblies.

Q Now, referring to what has been marked as Exhibit Number 1, would you identify and discuss that exhibit, please?

A Exhibit Number 1 is a location plat showing the two wells involved in this case, the Baish A Lease, and the crosshatched area, it shows the outline of the Maljamar-Abo Pool as defined by the Oil Commission, in red, and the outline of the Baish-Wolfcamp Pool in green. The wells which produce or have produced from the Abo are circled in red. The wells which produce or have produced from the Wolfcamp are circled in green. The Baish A Lease is described as the north half southwest quarter, and the north half of the southeast quarter of Section 21, and west half of the northwest quarter of Section

22, Township 17 South, Range 32 East, Lea County, New Mexico.

The two wells involved here, Baish A Number 12 and 13, are circled in both red and green, being Abo-Wolfcamp dual completions; and to further identify the wells, I have filled in the red circles to make them stand out a little more.

The plat also shows the location of wells and the ownership of them, and the formations from which they produce by a letter symbol, the legend for which appears in the lower left-hand corner of the exhibit.

Q Refer to Exhibit Number 2. Would you identify that exhibit?

A Exhibit Number 2 is a structure map showing the structural configuration of a marker we have designated as the A-2 marker in the Abo Formation. The contour interval is twenty-five feet. The wells involved here are circled in red. The structure might be described as a general southeast plunging nose with somewhat low relief.

This reservoir is a stratographic trap, and the estimated location of the permeability pinchout is shown by the dashed line.

Q Is the Maljamar-Abo Pool a type of stratographic area, generally?

A Yes, it is.

Q Referring to Exhibit Number 3, would you identify that exhibit?

A Exhibit Number 3 is a structure map showing the structural configuration of a marker which we have designated TB-9 marker in the Wolfcamp Formation. This structure is very similar to the Abo, and this reservoir is also a stratographic trap, and the location of the permeability pinchout is shown again by the dashed lines, to the best of our knowledge and belief.

Q Referring to what has been marked as Exhibit Number 4, would you discuss the reservoir performance of these pools?

A Exhibit Number 4 has two parts. The upper part shows the reservoir performance of the Maljamar-Abo Pool. The lower part shows the reservior performance of the Baish-Wolfcamp Pool.

The oil production, this is monthly oil production in barrels per month, is shown by the heavy solid line; gas production in MCF per month is shown by the dashed line; the number of wells appears at the bottom; and where it applies, the water is shown by the light solid line.

Now, you will note that both of these curves are plotted on logarithmic scale vertically, and the smallest amount which can be plotted is 100 barrels per month. The

water production in the Maljamar-Abo Pool has never amounted to that much, and occurrences of this volume of water in the Baish-Wolfcamp is quite rare.

The highest water production occurred in March of 1966, when the volume was approximately 230 barrels for that month.

MR. KELLAHIN: If the Examiner please, the next series of exhibits we have broken into two parts, designated as Exhibits 5-A through 9-A, dealing with the Number 12 Well. And then 5-B through 9-B deal with the Number 13 Well, in order to group the discussion of the individual wells without too much confusion.

Q Referring to what has been marked as Exhibit 5-A, would you identify that exhibit, please?

A Exhibit 5-A is a copy of a portion of the sonic log which was run on the Baish A Number 12. It shows the top of the Abo Formation at 7,570, the Abo perforations in the gross interval 8,905 to 8,977. The top of the Wolfcamp Formation is shown at about 9,048, and the Wolfcamp perforations in the gross interval from 9,926 to 9,882.

Q Now, Referring to Exhibit 6-A, can you identify that exhibit?

A Exhibit 6-A shows the declined curve for both of

the completion intervals in Baish A Number 12. The upper portion shows the performance of the Maljamar-Abo Zone. The lower portion shows the performance of the Baish-Wolfcamp Zone. Estimated future production has been extrapolated by the dashed line to the right of the exhibit.

Since this paper was limited to ten years, and the remaining life exceeded that, period, we have plotted 1974 and 1975 parallel to and below the production for 1969 and 1970. Both of these have been extrapolated to an economic limit of 250 barrels per month.

Q Now, the well as to both zones shows a decline in production at the present time, does it not?

A Yes, sir.

Q Are these wells beginning to reach their economic limit?

A No, they are not reaching their economic limit, but they are -- they have virtually reached their limit of production flowing.

Q Now, referring to Exhibit 7-A, would you discuss that exhibit?

A Exhibit 7-A is a plot of the extrapolated decline curves shown from Exhibit 6-A, both on a segregated basis for the Wolfcamp and Abo, extrapolated to an economic limit of

250 barrels a month, and for the two zones commingled to an estimated economic limit of 275 barrels per month.

The crosshatched area beneath the upper curve represents the amount of additional oil that will be recovered by commingling in the well bore.

Q And Exhibit 8-A, would you discuss that exhibit?

A Exhibit 8-A is a comparison of oil recovery and revenue for the Baish A Number 12, on a segregated basis as opposed to a commingled basis. This means that the well would be operated on a segregated basis as a dual completion until the Wolfcamp reaches its economic limit, and then a single completion thereafter.

Of course, with commingling in the well bore, it would operate until the combined zones had reached the economic limit.

Q Does that reflect that you will get additional recovery of oil as a result of commingling?

A Yes, sir. This exhibit shows that the reserve for the Abo on a segregated basis is 47,600; and the Wolfcamp, 50,900 barrels of oil. And commingling, we estimate the reserves to be 107,600 barrels.

Q These are recoverable reserves you are talking about?

A Yes, sir.

Q In the exhibit, you have one item, State revenue for the Abo, $9,796; and for the Wolfcamp, $10,689. Does that reflect royalty payments or is that confined to taxes, or what is that figure?

A It says that it involves royalty and taxes, but on checking, I find that it amounts to just the taxes, based on twenty-one cents taxes per barrel.

Q And then it is not royalty and taxes?

A It does not include royalty. I might mention that this is a Federal lease, and in New Mexico thirty-seven and a half per cent of the royalty to the Federal Government is returned to the State.

Q That would be in addition to any figure shown on Exhibit 8-A?

A Yes, sir.

Q So actually the revenue to the State would be greater than the figure shown here?

A That is true.

Q Now, referring to what has been marked as Exhibit 9-A, would you discuss that exhibit?

A Exhibit 9-A is a schematic diagram showing on the left-hand side the present completion of Baish A Number 12,

and on the right-hand side the proposed completion. It shows that thirteen-and-three-eighths OD casing set at 800 feet with 900 sacks of cement circulated to the surface; nine-and-five-eighths inch casing set at 4,570 with 1,950 sacks of cement circulated to the surface. The well was drilled to a total depth of 13,717 feet, to test the Devonian Formation, which was found to be water productive.

The well was plugged back, and seven inch casing set at 10,850 feet with 1,220 sacks of cement, the top of which was found by temperature survey at 3,000 feet.

Presently the well is equipped for flowing conditions, and there is one string of two-and-seven-eighths inch tubing, which is the Wolfcamp string, and one string of two-and-three-eighths inch casing.

The well was completed in March of 1964 as an Abo-Wolfcamp dual completion under the authority of Order Number C-1463. Initial potential from the Wolfcamp was 345 barrels of oil, five barrels of acid water and 368.8 MCF of gas. Initial potential in the Abo was 142 barrels of oil, twenty-eight barrels of load water, and 986 MCF of gas.

A packer, Model D packer set between the zones at 9,785. The well, as I mentioned, is equipped with two strings of tubing, one two-and-three-eiththh and one two-and-seven-eighth

OD. Bottom hole pressure in both zones has declined to the extent that the well will no longer flow. The initial pressure in the Abo was measured at 3,042 pounds per square inch, the initial Wolfcamp pressure 3,645 PSI.

In June, 1968, the pressures were measured at 1,675 for the Abo, and 1,431 pounds for the Wolfcamp.

Q Are either one of these zones on artificial lift at the present time?

A No, sir.

Q Are they both flowing?

A They flow intermittently. It is necessary to swab them quite frequently to keep the wells producing.

Q It will be necessary to install some type of pumping equipment if this application is not approved, is that right?

A Yes, sir.

Q Referring to the right side of Exhibit 9-A, will you discuss that portion of the exhibit?

A We propose to leave the Wolfcamp tubing string as it is. We will set a retrievable packer at 8,875, just above the Abo perferations. The dual flow choke will be set at 9,750, just above the lower packer at a point allowing the production

to be commingled inside the tubing. The second string of tubing will be set at 8,785 with the bottom hole assembly. From this point, conventional hydraulic pumping will lift the commingled production to the surface.

As shown at the top of the schematic where the proposed installation power oil will be pumped down one string of tubing -- we have represented this in the red color -- and the commingled Wolfcamp and Abo liquids will be produced together with the power oil, which is represented in the purple color. The gas from both zones will be vented through the casing tubing annulus, and will not have to be lifted by the pump.

Q You will have some further discussion of this completion, particularly the dual flow choke, in connection with another exhibit?

A Yes, sir, we have another exhibit which shows this in more detail.

Q Now, referring back to Well Number 13, and I call your attention to Exhibit Number 5-B, will you discuss that exhibit, please?

A Exhibit Number 5-B is a copy of the sonic log on Baish A, Number 13. It shows the top of the Abo at 7,560, the Abo perforations in the gross interval of 8,918 to 8,951.

The top of the Wolfcamp is shown at approximately 9,047. The Wolfcamp perforations are shown in the gross interval, 9,797 to 9,873.

Q Referring to what has been marked as Exhibit 6-B, will you discuss the production performance of this well?

A Exhibit 6-B is a plot of the well performance for Baish A Number 13. The upper portion shows the decline curve for the Maljamar-Abo completion. The lower section shows the decline curve for the Baish A Wolfcamp completion. Here again we have extrapolated the estimated production by the dashed line to an economic limit of 250 barrels per month for each zone.

Q Now, the various Wolfcamp performance curves show a number of breaks, and rather erratic performance. Do you have any explanation for that?

A The production has been interrupted from time to time due to the necessity to swab the well off. You will notice that in two occasions in 1966 and 1967, this occurred toward the end of the year. At this time of the year, there is generally an economic drive in our company, so that any work is deferred which will not pay off before the end of the year. I believe this is the reason that the production is interrupted at those places.

Q There was a substantial increase in the production of the well in 1968, though, was there not?

A Yes, sir.

Q It would appear that your extrapolated curve would be somewhat high if it is based on the curve as shown here. Do you have any comment on that?

A The Wolfcamp in this well has recently, in September, as a matter of fact, been placed on the pump, and this producing rate is based on our experience with the pumping installation, and what we estimate to be improved pumping conditions, by eliminating the necessity to pump the zone under a packer.

Q It is presently being pumped?

A Yes.

Q Now, referring to what has been marked as Exhibit 7-B, would you identify that exhibit?

A Exhibit 7-B is a plot showing the extrapolated producing rates which are estimated for the Abo and Wolfcamp on a segregated basis to an economic limit of 250 barrels per month. And then above this, a curve showing the estimated combined production on a commingled basis. This is extrapolated to an economic limit of 275 barrels per month. And again we have shown the additional oil that will be recovered by commingling downhole by the crosshatched area.

Q Is that a substantial amount of oil?

A I think it amounts to about 4,000 barrels.

Q Now, referring to what has been marked as Exhibit 8-B, would you identify that?

A Exhibit 8-B is a comparison of all recovery and revenue from Baish A Number 13 in the upper portion showing the reserves and revenue, and on a segregated basis, and the portion below showing the well operated as a single completion, commingling in the well bore.

It shows that the reserves for the Abo on an individual basis, segregated basis, of 55,000 barrels, and for the Wolfcamp at 39,200 barrels; whereas on a commingled basis, the estimated reserves are 98,200 barrels, which is an increase of 4,000 barrels.

Q Now, this exhibit also shows an item for the royalty and taxes, State revenue, $11,550. Does that include any royalty?

A No, it does not. This is taxes only.

Q And the same would be true as to the Wolfcamp item of the $20,622, that is taxes only?

A That's right.

Q And no royalties are in the calculation?

A Right.

Q Referring to Exhibit 9-B, will you identify that?

A Exhibit 9-B is a schematic diagram showing on the left the present completion of the well, and on the right-hand side the proposed completion. Thirteen-and-three-quarter inch OD casing set at 821 feet, cemented to surface with 485 sacks. Eight-and-five-eighths inch casing set at 4,600 feet, with 1,485 sacks of cement, which was circulated to surface. Five-and-a-half inch casing was set at 9,955, with 1,376 sacks of cement, and temperature survey indicated top of cement at 2,200 feet.

As shown, the Wolfcamp completion is now being lifted by hydraulic pumping equipment. We have attempted to show this by colors, the power oil is shown in red, and the commingled Wolfcamp production and power oil production is shown in the purple.

The Abo Zone is still flowing intermittently, and is shown by the yellow coloration. Now, we propose to set a retrievable packer at 8,875.

Q Will the completion be substantially the same as for the Number 12 Well?

A Yes, sir. Let me give the Examiner the completion data on this well. The well was dually completed under authority of Order MC-1551. Initial potential of the Maljamar was 330 barrels of oil and nine barrels load water, with 652 MCF of gas.

The Wolfcamp potential was 200 barrels of oil, forty barrels load water, and 196.2 MCF of gas per day.

Initial bottom hole pressure in the Abo was measured at 4,650, and at the Wolfcamp at 2,819.

Bottom hole pressure in both zones have declined to the point that the wells will no longer flow.

As shown at the right-hand side of the exhibit, we propose the completion very similar to Number 12, except the tubing strings will consist of two-and-one-sixteenth inch integral joint tubing. A Baker model D packer set at 9,750 on original completeion. We propose to set a retrievable packer at 8,875. The dual flow choke will be set at 9,650, just above the lower packer, and the short string of tubing with the bottom hole assembly will be set at 8,875, from which point the commingled liquids will be lifted to the surface by hydraulic pumping equipment.

Q Now, referring to Exhibit Number 10, Mr. Lyons, would you discuss the completion and operation of the subsurface equipment that will be installed in this well, these two wells?

A This one exhibit shows schematically in more detail the proposed equipment to be run in these two wells. Now, there is a difference in tubing size and casing size, and we have indicated at the bottom of the exhibit these differences.

Other than those differences, the information shown on this exhibit applies equally to both wells.

We show the tailpipe here beginning at the bottom where the Wolfcamp -- excuse me, we show the tailpipe and then the Otis landing nipple, and no go nipple, which will prevent both open hole pressure bombs and other equipment lowered into the well from going out the open end of the tubing.

Then we have the model D packer, and above this the Otis landing nipple with side door coupling and dual flow check assembly.

We have shown the Abo completion, or the Abo fluid by the yellow color, and you can see by the schematic that the Abo enters the device through its own check valve, and is exhausted above the tool. The baffle catch is shown in blue, and enters the device through its own check valve, and goes through and is commingled before the tool, and the commingled production is shown in green, light green color.

Q In other words, the yellow and blue make a green oil, is that correct?

A That was the idea. (Laughter.)

Q What happens once the oil has been commingled? How does it flow to the surface?

A Commingled production flows from the dual flow choke

to the perforations which are just above the upper packer. At this point they are diverted to the casing tubing annulus by the blanking plug. Then they re-enter the tubing through the perforations which are shown above the blanking plug.

When the fluids are exhausted into the casing tubing annulus, the gas is permitted to break out of solution, and is produced through the annulus at the surface. This permits the relatively gas-free oil to re-enter the tubing where it is lifted by the hydraulic pump. Here again we have shown the power oil in red, and the combined power oil and commingled Abo and Wolfcamp production in purple.

Q Now, referring to what has been marked as Exhibit Number 11, would you identify that exhibit, please?

A Exhibit Number 11 is an economic limit calculation showing how we have arrived at the economic limit for the zones on a segregated basis, and on a commingled basis. We estimate that our operating expense for each zone is $600 a month. On a commingled basis, we estimate our expense to be $665.

After deducting from the gross value received for the oil, for taxes and royalties, we come to a net value which divided into the operating expenses, gives us the economic limit.

Q Now, you said the expenses, operating expenses for each zone is $600 per month for each zone, is that right?

A Yes, sir.

Q And then $665 per month operating costs would apply to both zones on a commingled basis?

A Yes, sir.

Q In other words, you have approximately clipped your costs in half?

A Nearly in half, yes, sir.

Q As to the royalty, what royalty figure do you you use in making this calculation here?

A Well, this is a Federal Lease, and royalty to Federal Leases vary. And this calculation was made assuming a normal one-eighth royalty.

Q Although actually the royalty is somewhat different on this particular lease, is it not?

A I believe that is true.

Q Referring to what has been marked as Exhibit Number 12, would you identify that exhibit, please?

A Exhibit Number 12 is a summary of well and reservoir data for Baish A Wells Number 12 and 13. The left-hand column shows the Maljamar-Abo, and the right-hand column shows the Baish-Wolfcamp. We show on here the initial potential, the latest tests, the original bottom hole pressure, the current bottom hole pressure, and cummulative oil pressure from each

zone of these two wells.

Q Now, Mr. Lyons, if this installation is made on this particular well, will the liquids from either formation be in contact with the completion interval of other formations?

A No, they will not. The check valves in this tool will prevent the production from either zone coming in contact with the other zone. They are not commingled until they reach the tubing, and do not contact the casing until they are diverted by the blanking plug at the perforations above the upper packer.

Q Can tests of the individual zones be conducted?

A Yes, sir. The procedure is somewhat complex. First, the pump is surfaced by reversing the flow. Then by sinking wire line trips, the standing valve, the blanking plug, and the dual flow choke are removed. Then the dual flow choke is replaced with one of the flow tubes plugged off, and it is rerun by wire line, and the blanking plug and then the standing valve rerun. Then the hydraulic pump is pumped into the hole and the test is commenced.

When production has stabilized, the pump is again surfaced. The blanking plug is then pulled out -- excuse me, the standing valve, and then the blanking plug, and then the dual flow choke are removed by wire line. This is the test one zone.

If you proceed to test the other zone, then it is necessary, when the dual flow choke is at the surface, you open the one flow tube, and blank off the other one, and rerun it into the hole with wire line, and then the blanking plug and then the standing valve and then the pump is rerun and the test is conducted. Then the pump is surfaced again, and the standing valve, the blanking plug and the dual flow choke are removed by successive wire line runs. Then the dual flow choke is open through both production tubes, and the dual flow choke is rerun by wire line, the blanking plug and standing valve replaced, and the pump is then pumped back into the hole, and the well is ready to be placed back on production.

Q That is an extensive and time-consuming procedure, is it not?

A Yes, it is very.

Q Is there any alternative that you can recommend?

A We believe it is more economic, more efficient, and certainly more satisfactory to test only one zone and then test both zones together, and attribute the difference in production to the zone which was not tested. This would eliminate considerable testing time and considerable wire line work. It would also result in considerably less wear and tear on downhole equipment.

Q Would that type of test give you as accurate a picture of the production from the two zones as you would get by testing both zones?

A Yes, sir, I feel confident that it would be just as accurate.

Q Is that the procedure you would recommend on any tests that may be required by this Commission?

A Yes, sir.

Q Will Continental be able to run bottom hole pressure and packer leakage tests with this proposed equipment?

A Yes, sir, we can suspend the bottom hole pressure bombs below the blanking plug to record the upper zone pressure, and below the dual flow choke to record the lower zone pressure.

To do this, the flow choke for the lower zone must be plugged off, and we can get a build up on this zone. We can get a build up, and also a draw down pressure on the upper zone.

Q Now, what testing procedure do you propose initially and in the future should be made on these wells?

A On initial installation and each year thereafter at the normal time for reporting tests on the pools, I believe it is during April for these two pools, we propose to test one zone separately and then test both zones together, and allocate

the difference to the zone not tested. In other words, it would be tested by the subtraction method.

At such time as either zone is producing less than 500 barrels per month, I would recommend that the individual zone testing and packer leakage tests be discontinued as an unnecessary and excessive economic burden. The estimated cost of performing these tests is $400 to $600.

Q Now, Mr. Lyon, has Continental Oil Company had any experience with this type of completion in the State of New Mexico?

A Yes, this equipment has been used fairly extensively in the northwest part of the State. Unfortunately, my work does not involve this area, and I personally do not have experience with this equipment, but I have talked to our people up there, and they seem very well pleased with its operation, and so far as I can determine, it has been relatively trouble free.

Q Do you know what type of testing they utilize in the northwest? Do they use the testing procedure which you have recommended?

A Yes, it is my understanding that they use the subtraction method.

Q In your opinion, will the installation of this equipment as proposed by Continental in these two wells result

in a greater ultimate recovery of oil that would not otherwise be recovered?

A Yes, it would.

Q Is it possible that any waste will occur as a result of this installation?

A I think waste will be prevented in that additional oil will be recovered.

Q Do you see any possibility of any damage to either of the two reservoirs involved, as a result of this installation?

A No. In my opinion, there is little, if any, liklihood of any possible damage.

Q Mr. Lyon, were Exhibits 1 through 12, including Exhibits 5-A through 9-A, and 5-B through 9-B, prepared by you or under your supervision?

A Yes, they were.

MR. KELLAHIN: At this time I would like to offer in evidence Continental Oil Company Exhibits in Case 3995.

MR. UTZ: Without objection, Exhibits 1 through 12, including 5-A through 9-A and 5-B through 9-B, will be accepted into the record.

(Whereupon, Applicant's Exhibits 1-12, 5-A through 9-A and 5-B through 9-B were admitted in evidence.)

MR. KELLAHIN: If the Examiner please, that completes our direct testimony in this case. We do have present here in the hearing room, three represenatives of the manufacturer of this equipment, who are available for any questions, if you want any technical information on the installation that is being proposed by Continental. We would be happy to call them, if you so desire.

MR. UTZ: I doubt that it will be necessary.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Lyon, how long have you been using this equipment in northwest New Mexico?

A I'm not real sure. I think it is in the range of two years. I could find out for you. Three years, September of 1963, I believe.

Q How many wells do you have up there?

MR. TUNSTALL: How many wells, total? We don't know how many are in operation. It is operated through an agency, and not an Otis operation. It would be our service company that handles the service up there.

In answer to your question, there are six or seven in operation, but we lose track, because the third hearing permitted administrative approval on successive completion, and

for that reason no hearings were held so we could keep track of them, and it is operated through an agency rather than a direct Otis operation.

Q So you don't have any direct knowledge how well these units are operating out there?

MR. TUNSTALL: Other than conversations through the customer of Continental, and their happiness with them and continued use, no direct statements to the effect of any trouble. Had they had any trouble, I am sure we would have heard about it repeatedly. We usually do on troubles.

Q They are operating on three crews, are they not?

MR. TUNSTALL: Yes, sir.

Q Do you have much trouble with corrosion in these pools?

A We have a moderate corrosive condition here. I believe it was this year, it may have been 1967, but I can check the date if you would like to know the exact date. But we did have one instance where packer leakage test was unsuccessful. We had to pull the tube. We found holes in the tubing, in one of the strings, and this is one of the anomalous situations that you run into from time to time in the oil patch. Instead of the pitting occurring opposite the Abo perforations, where the influx of the fluids would tend to abrade any

treatment from the tubular goods, the pitting was found at about 5,500 feet, and also it was present in only one tubing string. The other tubing string was not affected at all.

We have theorized that perhaps this was initiated by an acid attack due to acid remaining on the tubing for an excessive period of time. This is speculation. We recognize that there is a corrosive condition here, and we feel that we can adequately inhibit against the corrosion and adequately protect the tubular goods.

Q Do you intend to do this?

A Yes, sir.

Q What kind of pressure differential in these zones do you think you have at this time?

A I believe that Exhibit 12 shows this. At last measurement, it was 2,044 pounds. The upper zone had the higher pressure.

Q Actually, these check valves don't have too much pressure differential in them?

A That is correct.

Q Now, is it your recommendation to make tests once a year?

A Yes, sir.

Q And in making these tests, you would have the

opportunity to inspect this tool?

A Yes.

Q It would come out of the hole?

A As far as the dual flow choke and the check valve, part of the tool stays in the well at the bottom hole location, and we will continue to separate the zones. Of course, they can be checked to see if they are holding, the check valves.

MR. UTZ: Any other questions? The witness may be excused.

(Witness excused.)

MR. UTZ: Are there any statements?

MR. KELLAHIN: That is all I have.

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, SAM MORTELETTE, 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 2nd day of January, 1969.

Sam Mortelette
NOTARY PUBLIC

My Commission Expires:

December 6, 1972

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3995, heard by me on Dec. 11, 1968.

Examiner
New Mexico Oil Conservation Commission

I N D E X

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E X H I B I T S

NUMBER	MARKED FOR IDENTIFICATION	OFFERED AND ADMITTED IN EVIDENCE
Exhibits 1-12	2	25
Exhibits 5-A - 9-A and 5-B - 9-B	2	25

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

December 31, 1968

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

Re: Case No. 3995
Order No. R-3645
Applicant:
Continental Oil Company

Dear Sir:

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

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

Carbon copy of order 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. 3995
Order No. R-3645

APPLICATION OF CONTINENTAL 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 December 11, 1968, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 31st day of December, 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, Continental Oil Company, is the owner and operator of the Baish "A" Wells Nos. 12 and 13, located, respectively, in Unit A of Section 21 and Unit E of Section 22, both in Township 17 South, Range 32 East, NMPM, Lea County, New Mexico.

(3) That each of the subject wells is presently dually completed for the production of oil from the Maljamar-Abo and Baish-Wolfcamp Pools through parallel strings of tubing.

(4) That the Baish "A" Well No. 12 is thought to be capable of producing approximately 40 barrels of oil per day from the Maljamar-Abo Pool and approximately 60 barrels of oil per day from the Baish-Wolfcamp Pool.

(5) That the Baish "A" Well No. 13 is thought to be capable of producing approximately 80 barrels of oil per day from the Maljamar-Abo Pool and approximately 70 barrels of oil per day from the Baish-Wolfcamp Pool.

(6) That the applicant proposes to produce and to commingle in a single string of tubing the marginal oil production from the aforesaid pools in each of the subject wells by means of a dual-flow downhole choke assembly without first measuring the production from each zone.

(7) That the subject zones in each of the wells will remain separated by packers.

(8) That the proposed commingling by means of dual-flow downhole choke assemblies may substantially extend the productive lives of each of the subject zones in the subject wells.

(9) That the fluid characteristics of each of the subject zones are such that waste would not be caused by the proposed commingling in the well-bores.

(10) That the proposed commingling by means of dual-flow downhole choke assemblies may result in the recovery of additional oil from each of the subject zones in each of the subject wells, thereby preventing waste, and will not violate correlative rights.

(11) That the marginal production from each zone in each of the subject wells must be artificially lifted.

(12) That artificial lift equipment has been installed on one of the subject zones in one well; that the other three zones are in need of artificial lift equipment; that stabilized rates of production have not been established for any of the subject zones.

(13) That production tests of either the Abo or Wolfcamp zones in each well should be conducted quarterly and the productivity of each zone established; provided, however, that the Secretary-Director of the Commission may authorize annual production tests if he determines, on the basis of previous tests, that a stabilized rate of decline and production has been achieved in each zone, and that quarterly tests are no longer necessary to accurately determine and allocate production from each zone.

IT IS THEREFORE ORDERED:

(1) That the applicant, Continental Oil Company, is hereby authorized to complete its Baish "A" Well No. 12, located in Unit A of Section 21, Township 17 South, Range 32 East, NMPM, Lea County, New Mexico, in such a manner as to produce oil from the Maljamar-Abo Pool through perforations from 8905 feet to 8977 feet and from the Baish-Wolfcamp Pool through perforations from 9826 feet to 9882 feet, commingling the production from each of said zones in a single string of tubing by means of a dual-flow downhole choke assembly in accordance with Exhibit Number 9-A introduced in this case;

PROVIDED HOWEVER, that said commingling 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 the applicant, Continental Oil Company, is hereby authorized to complete its Baish "A" Well No. 13, located in Unit E of Section 22, Township 17 South, Range 32 East, NMPM, Lea County, New Mexico, in such a manner as to produce oil from the Maljamar-Abo Pool through perforations from 8918 feet to 8951 feet and from the Baish-Wolfcamp Pool through perforations from 9797 feet to 9873 feet, commingling the production from each of said zones in a single string of tubing by means of a dual-flow downhole choke assembly in accordance with Exhibit Number 9-B introduced in this case;

PROVIDED HOWEVER, that said commingling 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.

(3) That Rule 112-A of the Commission Rules and Regulations shall apply insofar as said rule is not inconsistent with this order.

(4) That allocation of production to the Abo and Wolfcamp zones shall be by the subtraction method based upon production tests of the commingled Abo-Wolfcamp and either the Abo or Wolfcamp zones at stabilized production rates.

(5) That communication tests shall be conducted upon installation of each of the dual-flow downhole choke assemblies.

(6) That production tests of the combined zones and of either the Abo or Wolfcamp zone in each well shall be conducted quarterly and the productivity of each zone thus established.

(7) That communication tests shall be conducted annually on each well.

(8) That the operator of the wells shall notify the District Supervisor, Oil Conservation Commission, Hobbs, New Mexico, of the date and time production tests are to be conducted and shall furnish a complete report of such tests to the Commission's Hobbs District Office.

(9) That the Secretary-Director may authorize annual production tests if he determines, on the basis of previous tests, that a stabilized rate of decline and production has been achieved in each zone, and that quarterly tests are no longer necessary to accurately determine and allocate production from each zone.

(10) 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/

3995
Heard. 12-11-68
Rec. 12-23-68

Grant Cont. request for down-hole commingling using an Otis dual-flow downhole choke assembly in Their Baish 'A' #12-A-21-17S-32E.
" 'A' #13-E-22-17S-32E.

The Baish-Wolfcamp and the Maljamar-Abo in both wells are to be commingled.

B.H.P.'s + zone separation tests production shall be run each year. ~~They~~ These ~~separation~~ tests ~~shall~~ may be conducted on only one ~~side~~ zone.

R-2958 may be used as a type order.

[signature]

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. 3308
Order No. R-2978

APPLICATION OF CONTINENTAL OIL COMPANY
FOR AN ADMINISTRATIVE PROCEDURE, RIO
ARRIBA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on September 22, 1965, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 13th day of October, 1965, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

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

(2) That the applicant, Continental Oil Company, seeks the establishment of an administrative procedure whereby production from marginal Gallup-marginal Dakota dually completed oil wells in Rio Arriba County, New Mexico, may be commingled in the well bore by a dual-flow downhole choke assembly.

(3) That the applicant has established that it usually is not economically feasible to equip dually completed Gallup-Dakota oil wells in Rio Arriba County, New Mexico, for conventional operation when the Gallup and Dakota zones are marginal.

(4) That the applicant has established that use of a dual-flow downhole choke assembly in most marginal Gallup-marginal Dakota

oil wells in Rio Arriba County, New Mexico, will permit recovery of otherwise unrecoverable oil, thereby preventing waste.

(5) That the applicant has established that correlative rights can be protected by allocating production from most marginal Gallup-marginal Dakota oil wells in Rio Arriba County, New Mexico, to each zone by periodic production tests utilizing the subtraction method.

(6) That, to facilitate the administration of the laws of the State of New Mexico concerning prevention of waste and protection of correlative rights, an administrative procedure should be established whereby the Secretary-Director of the Commission may approve use of a dual-flow downhole choke assembly in marginal Gallup-marginal Dakota oil wells in Rio Arriba County, New Mexico, and allocation of production by periodic production tests if he determines that such approval will prevent waste and protect correlative rights.

IT IS THEREFORE ORDERED:

(1) That the use of a dual-flow downhole choke assembly in marginal Gallup-marginal Dakota oil wells in Rio Arriba County, New Mexico, may be authorized in accordance with the following-described administrative procedure:

a. The operator shall file an application, in TRIPLICATE, containing detailed data concerning gravity, value, and volume of the liquid hydrocarbons from each zone and anticipated gravity and value of the commingled production.

b. The application shall be accompanied by a schematic diagram of the proposed installation and a plat showing the location of all wells within one mile of the subject well and the zone from which each well is producing.

c. The Secretary-Director of the Commission may approve the application if he determines that such approval will prevent waste and protect correlative rights.

(2) That the following special restrictions shall apply to all wells utilizing a dual-flow downhole choke assembly:

a. Rule 112-A of the Commission Rules and Regulations shall apply insofar as said rule is not inconsistent with this order.

b. Allocation of production to the ~~Gallup~~ and ~~Dakot~~a zones shall be by the subtraction method based upon production tests of the commingled Gallup-Dakota and the Dakota zones at stabilized production rates.

c. A communication test shall be conducted upon installation of the dual-flow downhole choke assembly.

d. A production test shall be conducted ~~semi-annually~~; provided, however, that the Secretary-Director of the Commission may authorize annual production tests on individual wells if he determines, on the basis of previous tests, that semiannual tests are no longer necessary to accurately determine and allocate production from each zone.

e. A communication test shall be conducted annually.

f. The operator of the well shall notify the District Supervisor, Oil Conservation Commission, Aztec, New Mexico, of the date and time production tests are to be conducted and shall furnish a complete report of such tests to the Commission's Aztec District office.

(3) 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

JACK M. CAMPBELL, Chairman

GUYTON B. HAYS, Member

S E A L

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

esr/

CASE 3993: Application of Coastal States Gas Producing Company for the creation of a new oil pool and for special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new Pennsylvanian oil pool to be designated the North Baum-Upper Pennsylvanian Pool comprising the following-described lands:

Township 13 South, Range 33 East, Lea County, N. Mex.
Section 19: E/2
Section 20: NW/4 and S/2
Section 21: SW/4

and for the promulgation of temporary special rules therefor, including a provision for 160-acre spacing and proration units and the assingment of 80-acre allowables.

Applicant further seeks the contraction of the Lazy J-Pennsylvanian Pool by the deletion from said pool of the E/2 of Section 20 and the W/2 and SE/4 of Section 21, both in Township 13 South, Range 33 East, Lea County, New Mexico.

CASE 3994: Application of Kennedy Oil Company for an amendment to Order No. R-2752, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the amendment of Order No. R-2752, which authorized a waterflood project in the Square Lake Pool, Eddy County, New Mexico, to delete the water injection well previously authorized in Unit L of Section 20, Township 16 South, Range 31 East, and to authorize in lieu thereof a well in Unit K of said Section 20.

CASE 3995: Application of Continental Oil Company for downhole commingling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to commingle, by means of dual-flow downhole choke equipment, production from the Maljamar-Abo Pool and the Baish-Wolfcamp Pool in the wellbores of its Baish "A" Wells Nos. 12 and 13 located, respectively, in Unit A of Section 21 and Unit E of Section 22, both in Township 17 South, Range 32 East, Lea County, New Mexico, with the provision that no more than one single allowable be produced from each of said wells.

SUMMARY OF WELL AND RESERVOIR DATA

BAISH "A" WELLS NOS. 12 & 13

MALJAMAR-ABO AND BAISH-WOLFCAMP POOLS

	Maljamar Abo	Baish Wolfcamp
INITIAL POTENTIAL		
Baish "A" No. 12		
Date	3-5-64	2-27-64
Oil	130 barrels	345 barrels
Water	35 BAW	95 BAW
Gas	904 MCF	368.8 MCF
Baish "A" No. 13		
Date	12-21-64	12-5-64
Oil	332 barrels	280 barrels
Water	9 barrels	40 Bbls. load
Gas	651.8 MCF	196.2 MCF
LATEST TEST		
Baish "A" No. 12		
Date	10-20-68	1-18-68
Oil	44	43
Water	0	0
Gas	154	194
GOR	3500	6467
Oil Gravity ° API	42	42
Baish "A" No. 13		
Date	9-5-68	11-4-68
Oil	73	33
Water	0	0
Gas	144	76
GOR	1972	2303
Oil Gravity o API	42	42
Original BHP	3042	3645
Current BHP	1675	1431
Cumulative Oil Production:		
Baish "A" No. 12	91,864	174,490
Baish "A" No. 13	105,344	51,194

87

106

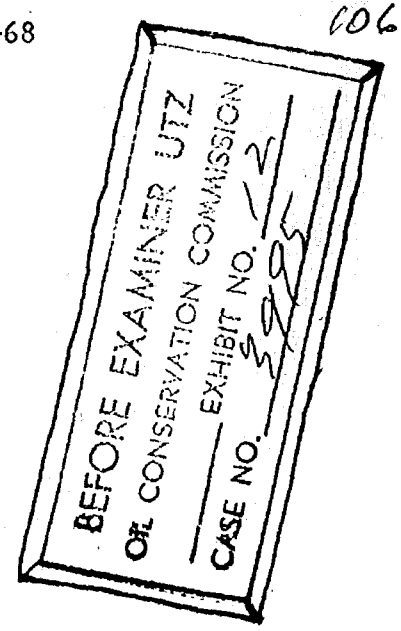
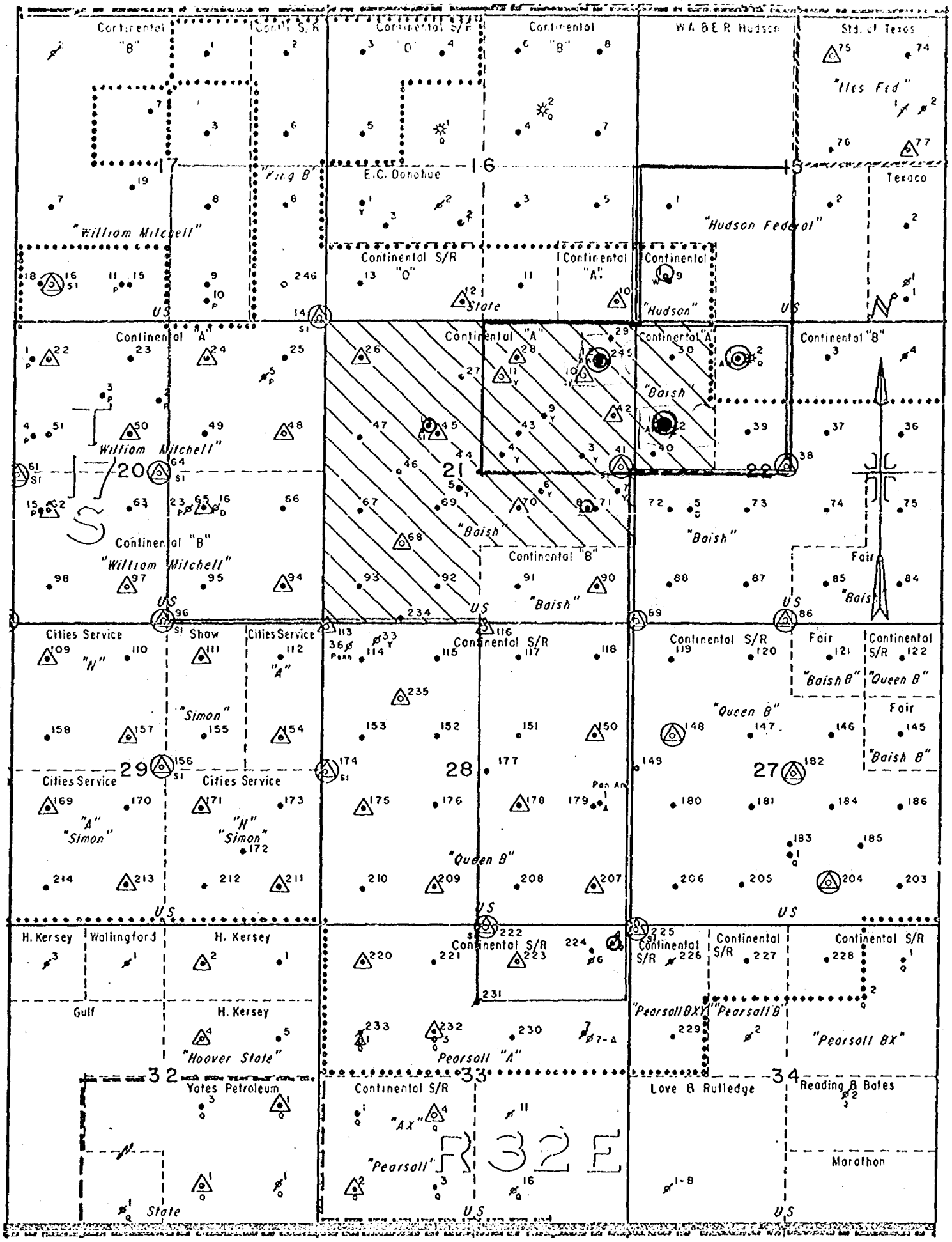


EXHIBIT NO. 12



— Maljamar Abo Pool

— Baish Wolfcamp Pool

Maljamar Abo Well

Baish Wolfcamp Well

Baish "A" Lease

•••• MCA Unit

Gas Injection Well

Water Injection Well

Grayburg-San Andres

Queen Paddock

Devonian Yates

Abo Wolfcamp

MCA Area

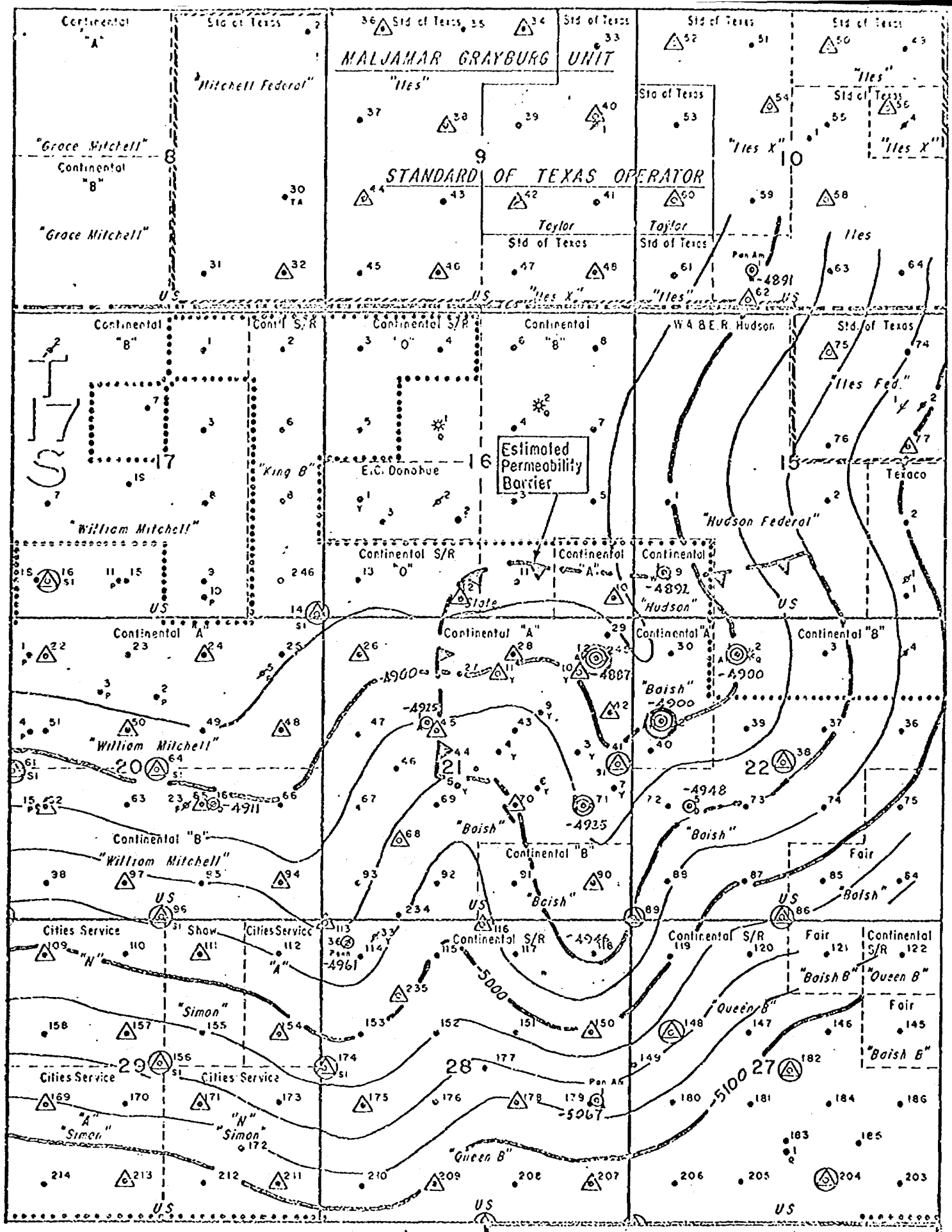
CONTINENTAL OIL COMPANY
PRODUCTION DEPARTMENT
HOBBS DIVISION

MALJAMAR POOL AREA
LEA COUNTY, NEW MEXICO

Scale: 1" = 2000'

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
CASE ____ EXHIBIT NO. 1

EXHIBIT NO. 1



PRODUCTIVE IN ABO

PENETRATED ABO

R 32 E

N.

MCA Unit

MCA Area

Devonian

Abo

Yates

Graybury-San Andres

Queen

Paddock

Wolfcamp

Water Injection

Gas Injection

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 2
CASE NO. 3995

CONTINENTAL OIL COMPANY

PRODUCTION DEPARTMENT

HOBBS DISTRICT

MALJAMAR POOL AREA

Lea County, New Mexico

ABO STRUCTURE CONTOUR MAP

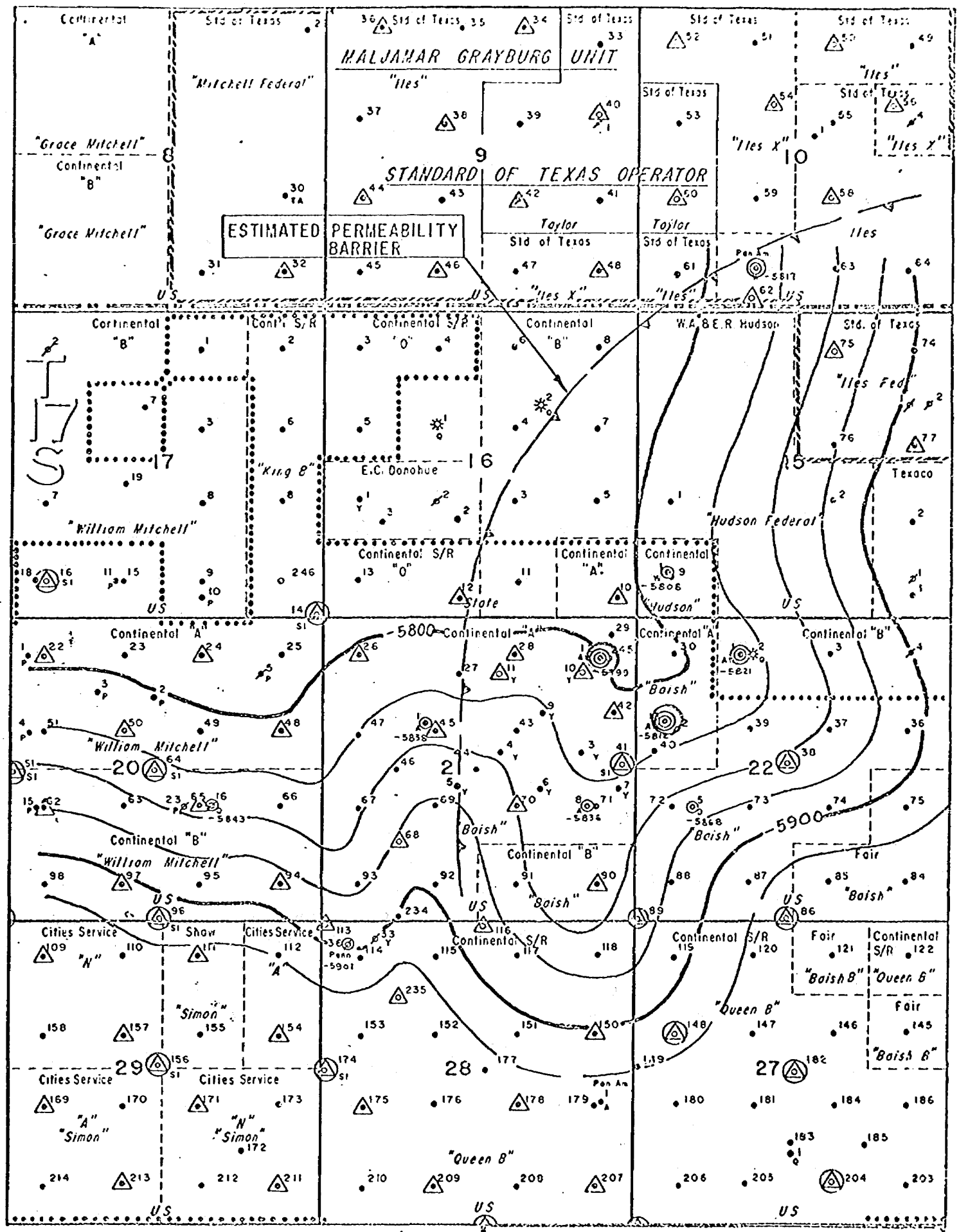
A-2 MARKER

CONTOUR INTERVAL: 25'

SCALE

N.E. Swick 6-27-65
N.G. Creager, Rev 11-20-68

Exhibit No. 2



PRODUCTIVE IN WOLFCAMP

PENETRATED WOLFCAMP

R32E

N.

MCA Unit

MCA Area

Water Injection

Gas Injection

D Devonian

A Abo

Y Yates

Grayburg-San Andres

Q Queen

P Paddock

W Wolfcamp

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 3
CASE NO. 3995

CONTINENTAL OIL COMPANY

PRODUCTION DEPARTMENT

HOBBS DISTRICT

MALJAMAR POOL AREA

Lea County, New Mexico

WOLFCAMP STRUCTURE CONTOUR MAP

W-9 MARKER

CONTOUR INTERVAL: 25'

SCALE 0 1000' 2000'

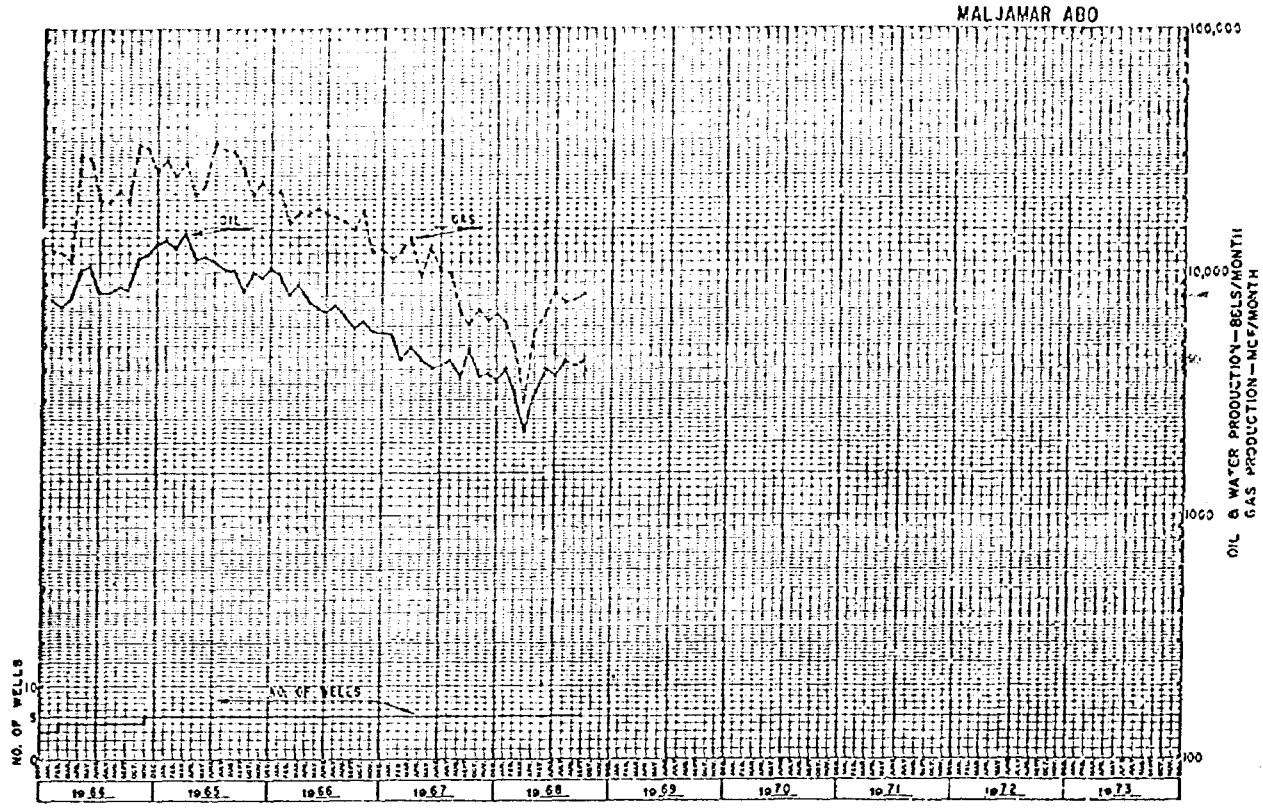
N.E. Swick, 6-27-65

N.G. Creager, Rev 11-20-68

Exhibit No. 3

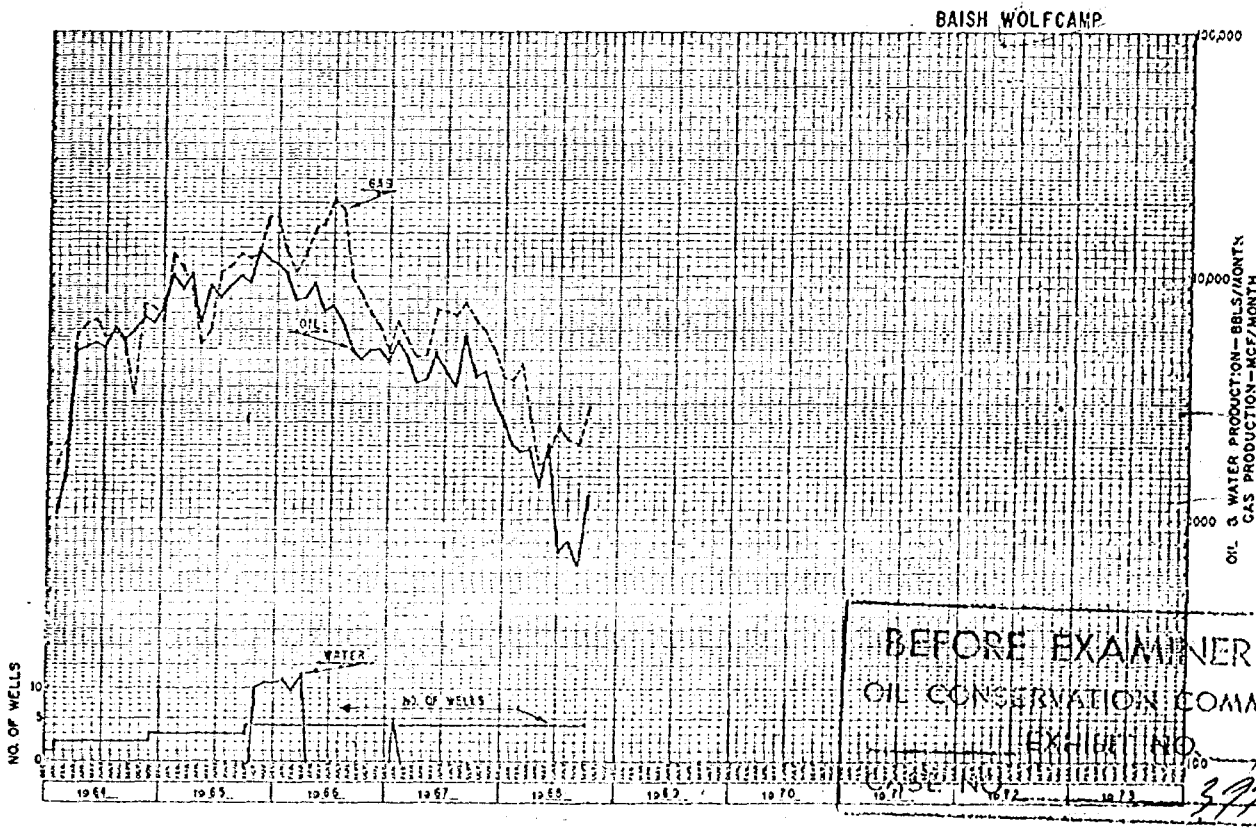
RESERVOIR PERFORMANCE CURVE

MALJAMAR ABO



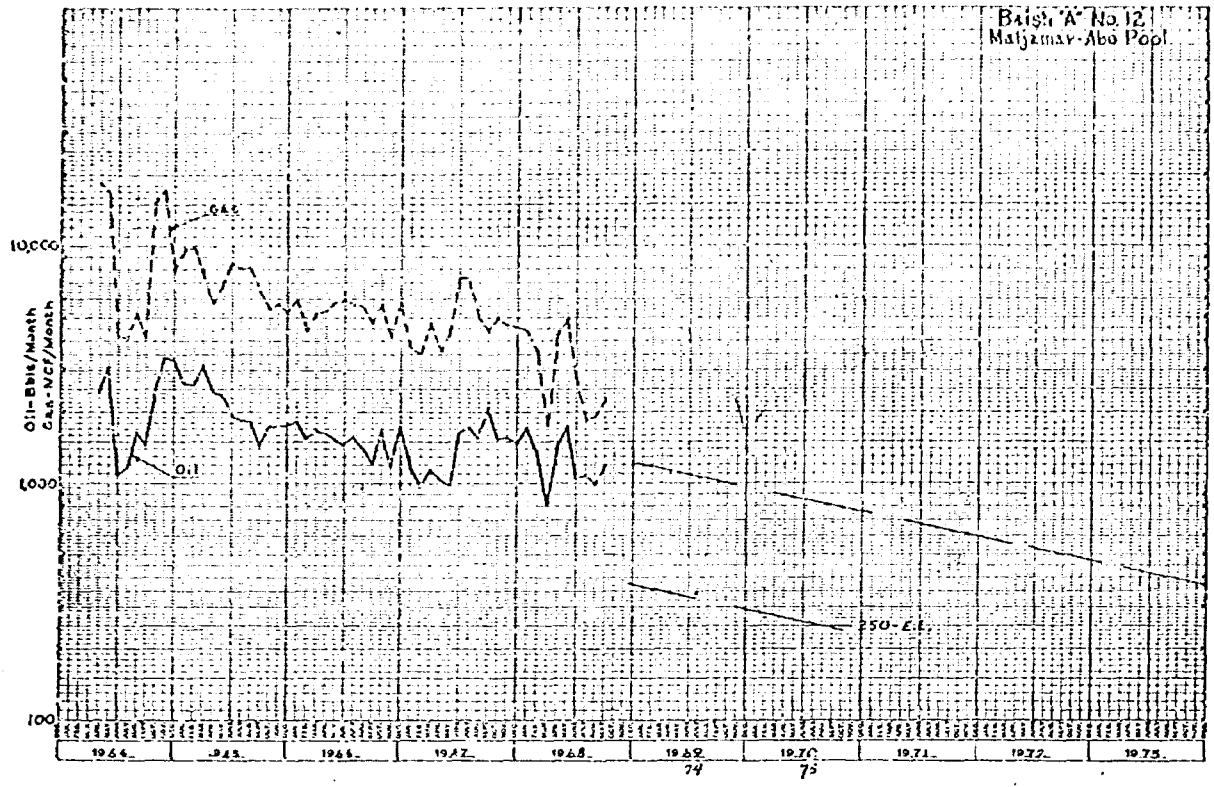
RESERVOIR PERFORMANCE CURVE

BAISH WOLFCAMP



BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 4
CASE NO. 3995

Exhibit No. 4



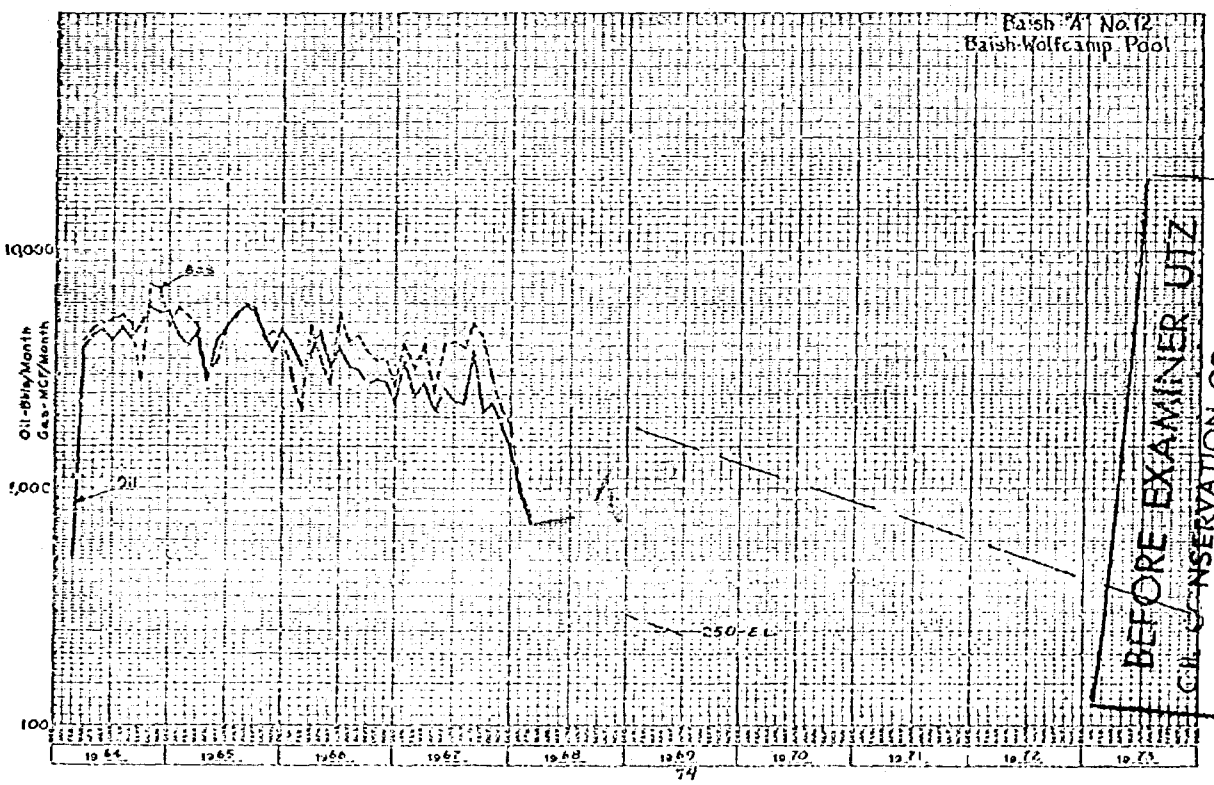


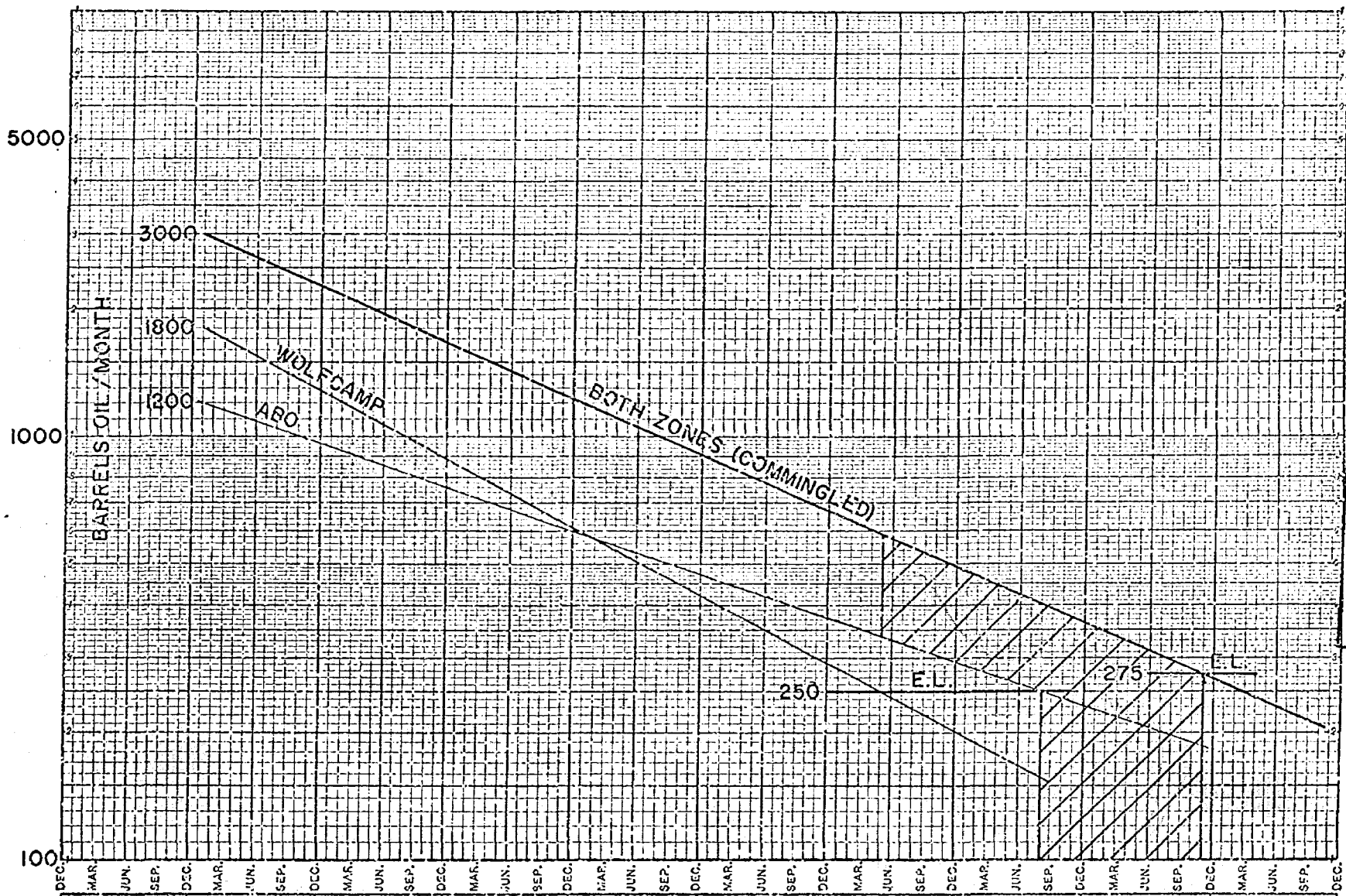
Exhibit No. 6a

NO. 3157. TEN YEARS BY MONTHS X 2 3-INCH CYCLES RATIO RULING.
CODEX BOOK COMPANY, INC. NORWOOD, MASSACHUSETTS.
PRINTED IN U.S.A.

BAISH "A" NO. 12
MALJAMAR ABO-BAISH WOLFCAMP POOLS

Exhibit No. 7a

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 7-A
CASE NO. 3995



COMPARISON OF OIL RECOVERY AND REVENUE

BAISH "A" NO. 12

MALJAMAR-ABO AND BAISH-WOLFCAMP POOLS

OPERATED AS DUAL COMPLETION,
THEN AS SINGLE COMPLETION,
AFTER WOLFCAMP REACHES ITS
ECONOMIC LIMIT:

ABO

Reserves	47,600 barrels oil
Producing Rate	Initial: 40 BOPD, Final: 8.3 BOPD
Life	6 years 8 months at 22% decline rate.
Net Value	$114,716 (Continental Revenue)
Royalty & Taxes	$28,084 (State Revenue - $9796)

WOLFCAMP

Reserves	50,900 barrels oil
Producing Rate	Initial: 60 BOPD, Final: 8.3 BOPD
Life	5 years 5 months at 31% decline rate
Net Value	$122,669 (Continental Revenue)
Royalty & Taxes	$30,031 (State Revenue - $10,689)

OPERATED AS SINGLE COMPLETION WITH
WELLBORE COMMINGLING:

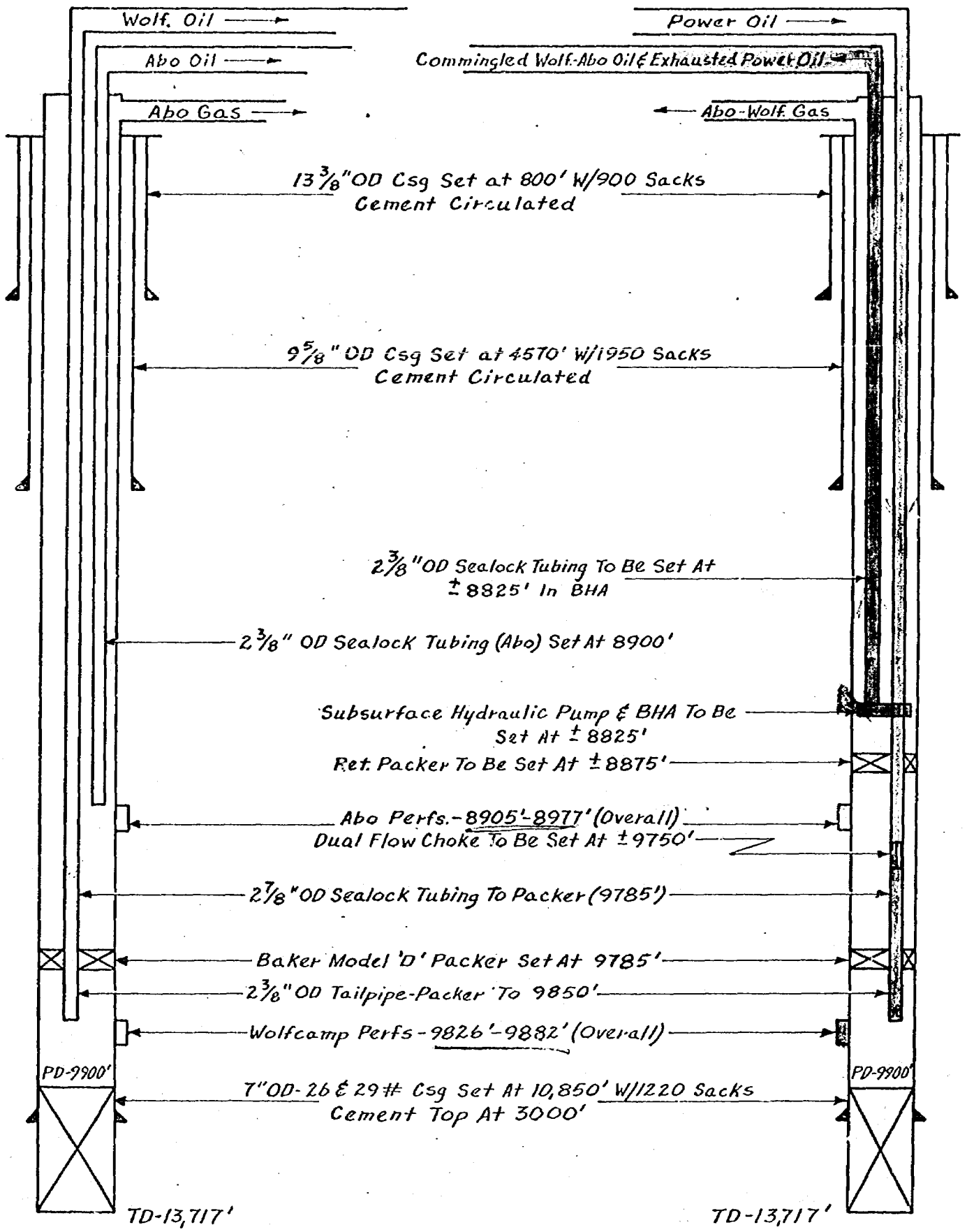
Reserves	107,600 barrels oil
Producing Rate	Initial: 100 BOPD, Final: 9.2 BOPD
Life	7 years 11 months at 26.5% decline rate
Net Value	$259,316 (Continental Revenue)
Royalty & Taxes	$63,484 (State Revenue - $22,596)

BEFORE EXAMINER UTZ.
OIL CONSERVATION COMMISSION
EXHIBIT NO. 8-A
CASE NO. 3995

EXHIBIT NO. 8-A

Present Completion

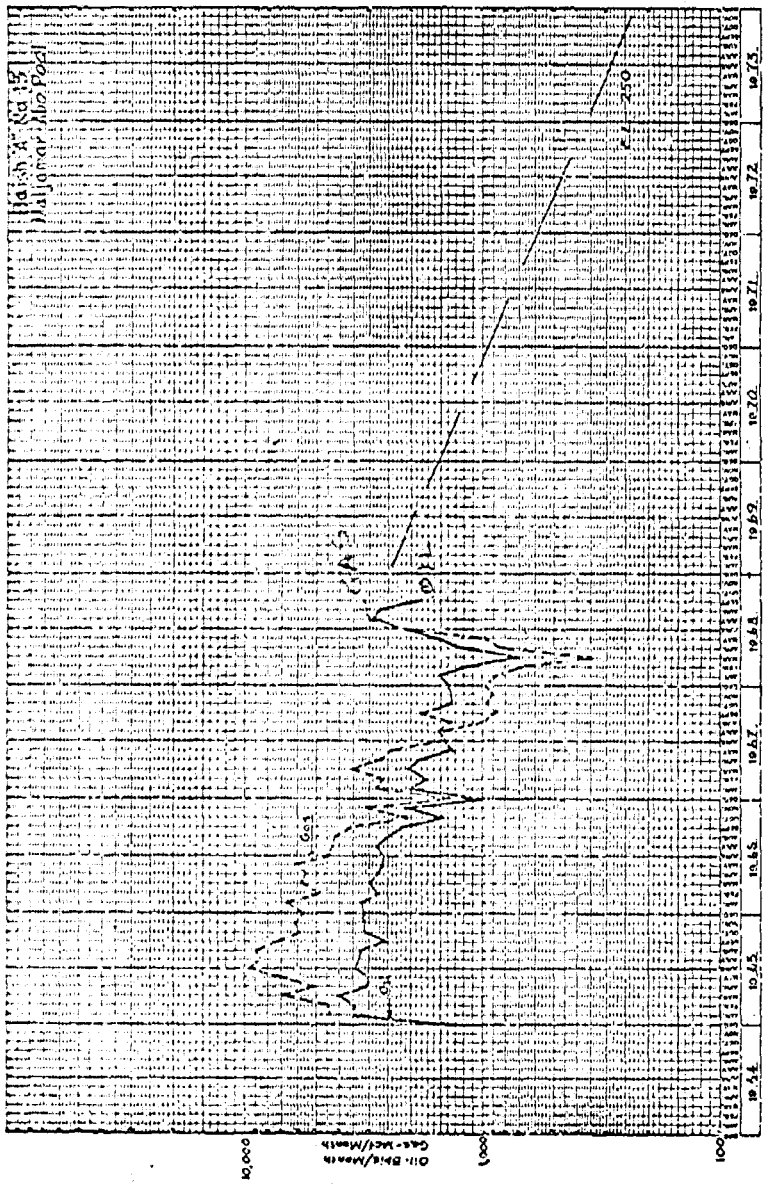
Proposed Completion

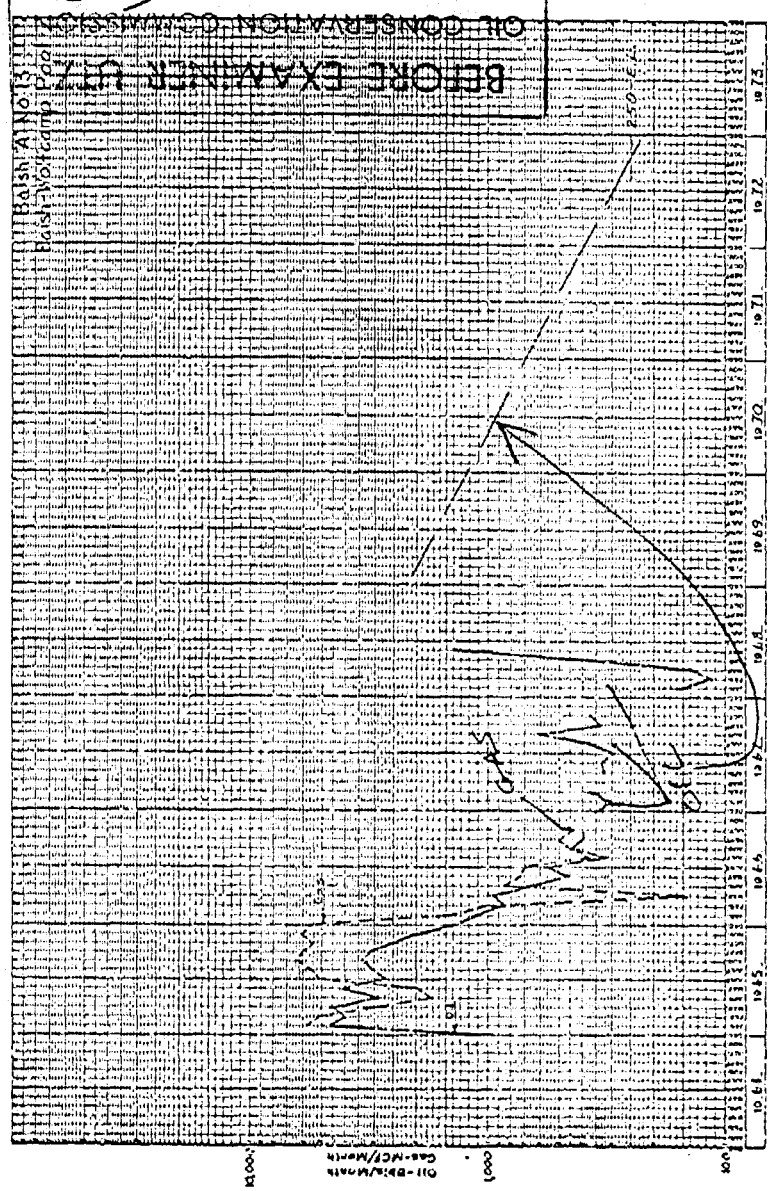


CONTINENTAL OIL COMPANY
BAISH "A" WELL NO. 12
MALJAMAR ABO-BAISH WOLFCAMP POOLS
LEA COUNTY, NEW MEXICO

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 9-A
CASE NO. 3995

Exhibit No. 9a





BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 6b
CASE NO. 3995

Exhibit No. 6b

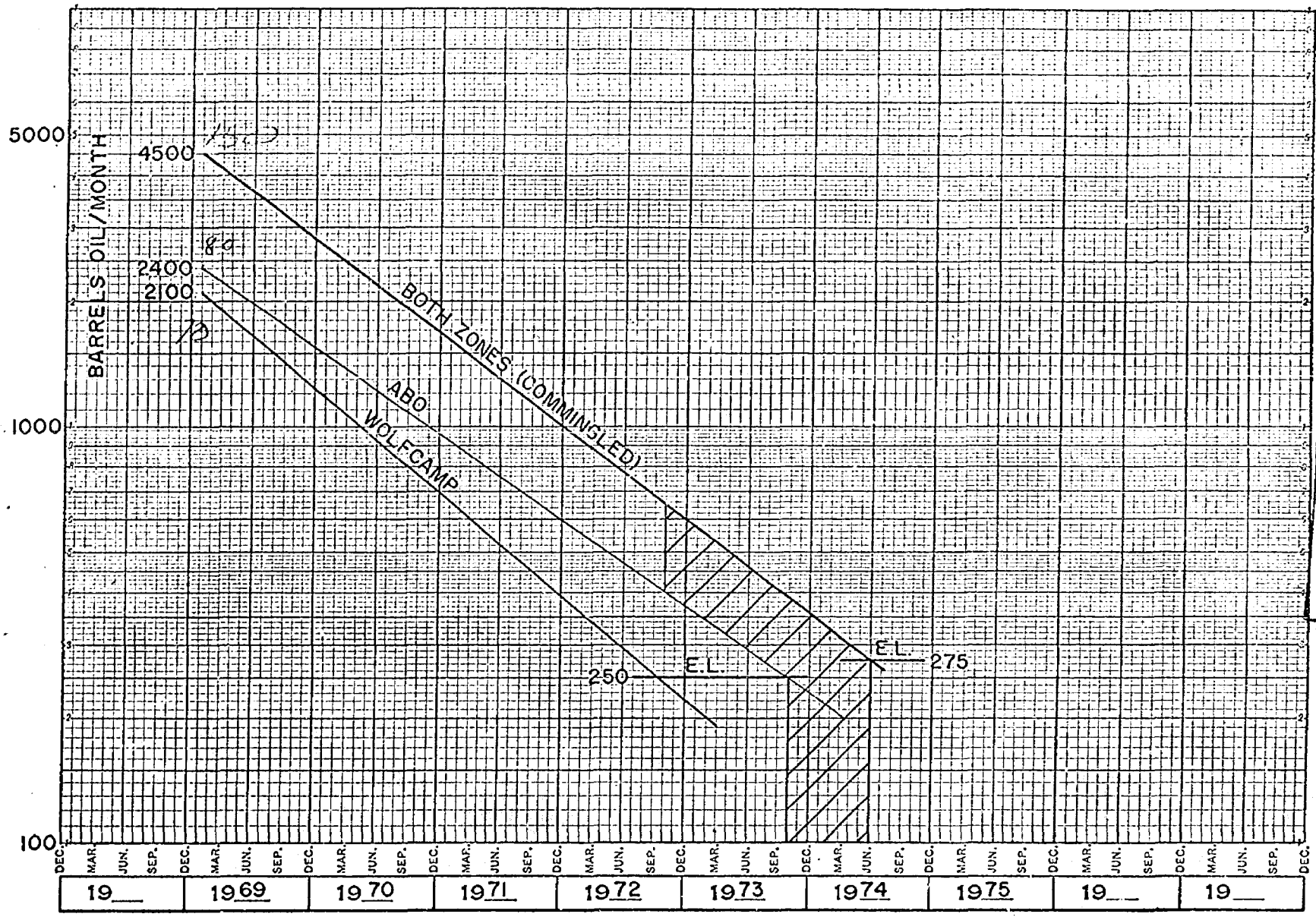
NO. 3157. TEN YEARS BY MONTHS X 2 3-INCH CYCLES RATIO RULING.
CODEX BOOK COMPANY, INC. NORWOOD, MASSACHUSETTS.
PRINTED IN U.S.A.

BAISH "A" NO. 13

MALJAMAR ABO-BAISH WOLFCAMP POOLS

Exhibit No. 7b

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 7b
CASE NO. 3955



COMPARISON OF OIL RECOVERY AND REVENUE

BAISH "A" NO. 13

MALJAMAR-ABO AND BAISH-WOLFCAMP POOLS

OPERATED AS DUAL COMPLETION,
THEN AS SINGLE COMPLETION,
AFTER WOLFCAMP REACHES ITS
ECONOMIC LIMIT:

ABO

Reserves	55,000 barrels oil
Producing Rate	Initial: 80 BOPD, Final 8.3 BOPD
Life	4 years 10 months at 38% decline rate
Net Value	$132,550 (Continental Revenue)
Royalty & Taxes	$32,450 (State Revenue - $11,550)

WOLFCAMP

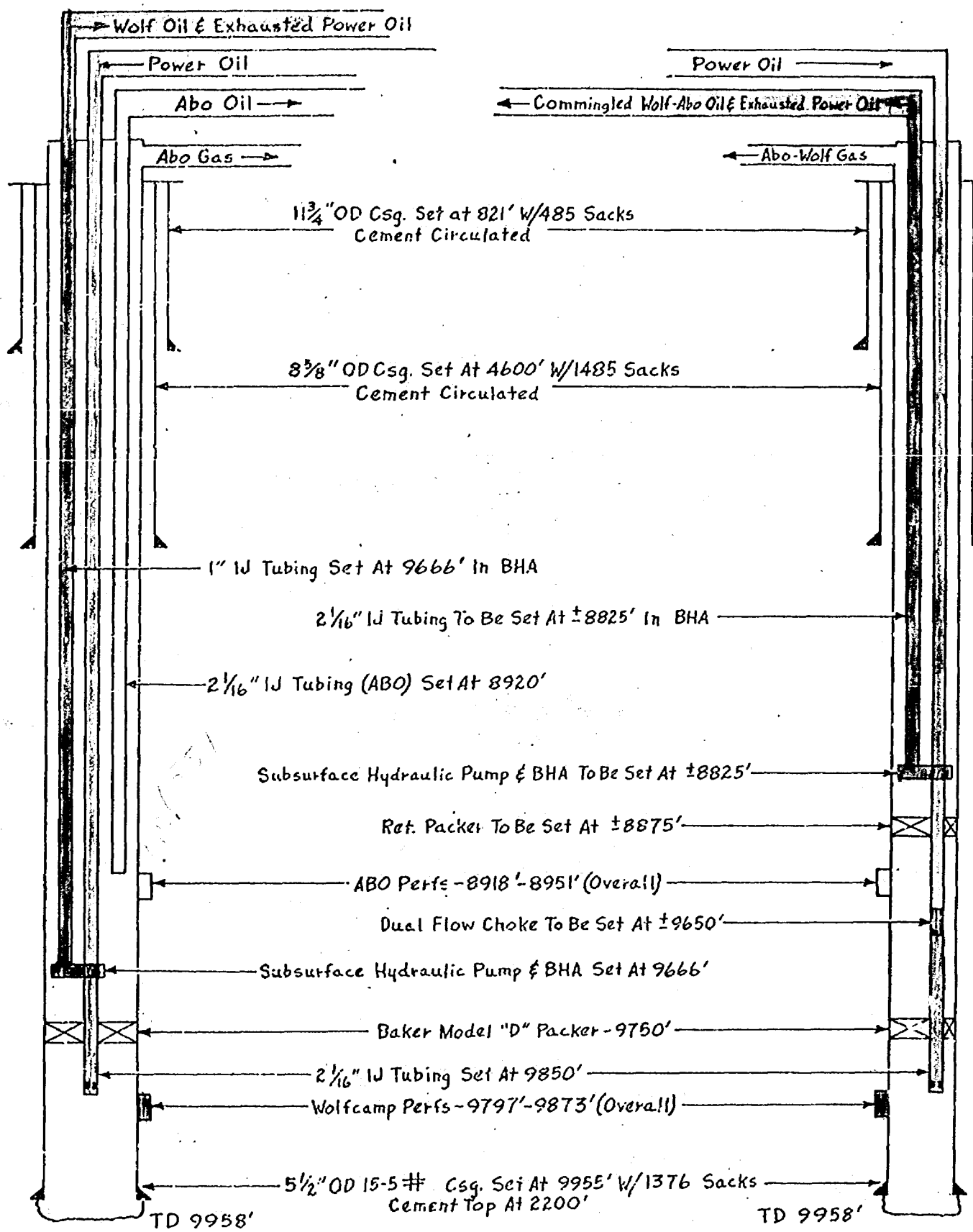
Reserves	39,200 barrels oil
Producing Rate	Initial: 70 BOPD, Final: 8.3 BOPD
Life	3 years 9 months at 41% decline rate
Net Value	$94,472 (Continental Revenue)
Royalty & Taxes	$23,128 (State Revenue $8,232)

OPERATED AS SINGLE COMPLETION WITH
WELLBORE COMMINGLING:

Reserves	98,200 barrels oil
Producing Rate	Initial: 150 BOPD, Final: 9.2 BOPD
Life	5 years 6 months at 39.5% decline rate
Net Value	$236,662 (Continental Revenue)
~~Royalty~~ & Taxes	$57,938 (State Revenue - $20,622)

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 8-B
CASE NO. 3995

EXHIBIT NO. 8-B

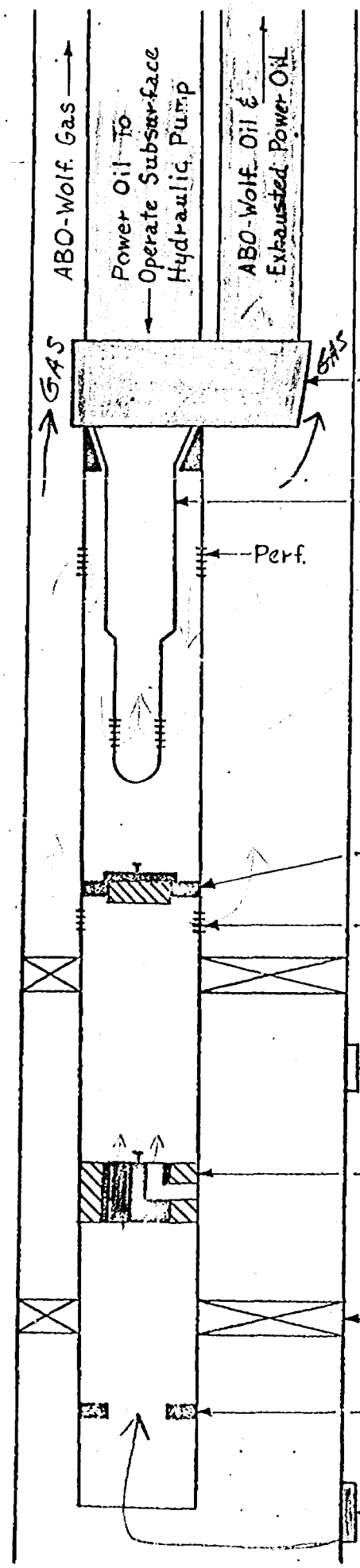


CONTINENTAL OIL COMPANY
BAISH "A" WELL NO. 13
MALJAMAR ABO - BAISH WOLFCAMP POOLS
LEA COUNTY, NEW MEXICO

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 9-B
CASE NO. 3995

Exhibit No. 9b

Continental Oil Company
Baish "A" No. 12 & No. 13
Subsurface Equipment



Subsurface Hydraulic Pump & Bottom Hole Assembly

Ret. Standing Valve For Subsurface Hydraulic Pump

Otis Landing Nipple With Blanking Plug - Ret.

Perf. Nipple

Baker Lok-Set Ret. Packer

Abo Perfs.

Otis Landing Nipple With Side-Door Coupling And Dual Flow Choke - Ret. & Dual Check Valve Assembly - Ret.

Baker Model "D" Packer

Tailpipe With Otis Landing Nipple And No-Go

Wolfcamp Perfs.

Well	Casing	Power Oil Tubing	Prod. Tubing
No. 12	7" OD	2 7/8" OD Sealock	2 3/8" OD Sealock
No. 13	5 1/2" OD	2 1/16" IJ	2 1/16" IJ

Exhibit No. 10

BAISH "A" NO. 12 & 13

ECONOMIC LIMIT CALCULATION

ABO

Operating Expense	$600
Sales Value per Barrel (including gas)	3.00
Taxes	.21
Royalty	.38
Net Value (after Taxes & Royalty)	2.41
Economic Limit	250 BOPM

WOLFCAMP

Operating Expense	$600
Sales Value per barrel (including gas)	3.00
Taxes	.21
Royalty	.38
Net Value (after Taxes & Royalty)	2.41
Economic Limit	250 BOPM

WELLBORE COMMINGLED CRUDE

Operating Expense	$665
Sales Value per barrel (including gas)	3.00
Taxes	.21
Royalty	.38
Net Value (after Taxes and Royalty)	2.41
Economic Limit	275 BOPM

NOTE: BOTH ZONES:

Working Interest	100%
Net Interest	87.5%

EXHIBIT NO. 11

CONOCO

CONTINENTAL OIL COMPANY

P. O. Box 460
HOBBS, NEW MEXICO 88240

PRODUCTION DEPARTMENT
HOBBS DIVISION
L. P. THOMPSON
Division Manager
G. C. JAMIESON
Assistant Division Manager

1001 NORTH TURNER
TELEPHONE 393-4141

68 NOV 22 AM 8 24

November 20, 1968

Case 3995

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

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

Re: Application for Downhole
Commingling Baish "A" Wells
Nos. 12 and 13.

Gentlemen:

Forwarded herewith in triplicate is our application for authority to commingle in the well bore production from the Maljamar-Abo and Baish-Wolfcamp Pools utilizing a dual-flow downhole choke assembly. Please set this matter for hearing on your December 11, 1968 examiner docket.

Yours very truly,

J. L. Thompson

VTL-JS

RLA JJB JWK

Attach

DOCKET MAILED
Date 11-26-68

IN THE MATTER OF THE APPLICATION OF
CONTINENTAL OIL COMPANY FOR AUTHORITY
TO COMMINGLE IN THE WELL BORE,
UTILIZING A DUAL-FLOW DOWNHOLE CHOKE
ASSEMBLY, PRODUCTION FROM THE MALJAMAR-
ABO AND BAISH-WOLFCAMP POOLS IN ITS
BAISH "A" WELLS NOS. 12 AND 13.

Case 3995

APPLICATION

COMES NOW, Applicant, Continental Oil Company and respectfully requests authority to commingle in the well bore, utilizing a dual-flow downhole choke assembly, production from the Maljamar-Abo and Baish-Wolfcamp Pools in its Baish "A" Wells Nos. 12 and 13, located in Sections 21 and 22, respectively, T17S, R32E, Lea County, New Mexico, and in support thereof would show:

1. Applicant is the owner of the Baish "A" Lease consisting of N/2, SW/4, and N/2 SE/4 Section 21 and W/2 NW/4 Section 22, T17S, R32E, Lea County, New Mexico.
2. Applicant, under the authority of Administrative Order MC-1463, drilled and dual completed in the Maljamar-Abo and Baish-Wolfcamp Pools its Baish "A" No. 12 located 660 feet from the North Line and 660 feet from the East Line of said Section 21.
3. Applicant, under the authority of Administrative Order MC-1551, drilled and dual completed in the Maljamar-Abo and Baish-Wolfcamp Pools its Baish "A" No. 13, located 1780 feet from the North Line and 460 feet from the West Line of said Section 22.
4. That both of said wells have ceased flowing from both formations and must be produced by artificial lift.
5. That utilization of a dual-flow downhole choke assembly will permit more efficient pumping, prevent produced fluids from either formation from contacting the other formation and permit testing of individual zones.

6. That production from both zones in each well will be less than top allowable for either pool and applicant proposes that production from each well be limited to the allowable of one producing zone.

7. That the granting of this application will result in the prevention of waste and will not impair correlative rights.

WHEREFOR, Applicant respectfully requests that this application be set for hearing before the Commission's duly appointed examiner and that upon hearing, an order be entered authorizing the commingling of production in the well bore, utilizing a dual-flow bottom hole choke assembly, in its Balsh "A" Wells Nos. 12 and 13 as described above.

Respectfully submitted,

CONTINENTAL OIL COMPANY

L. P. THOMPSON

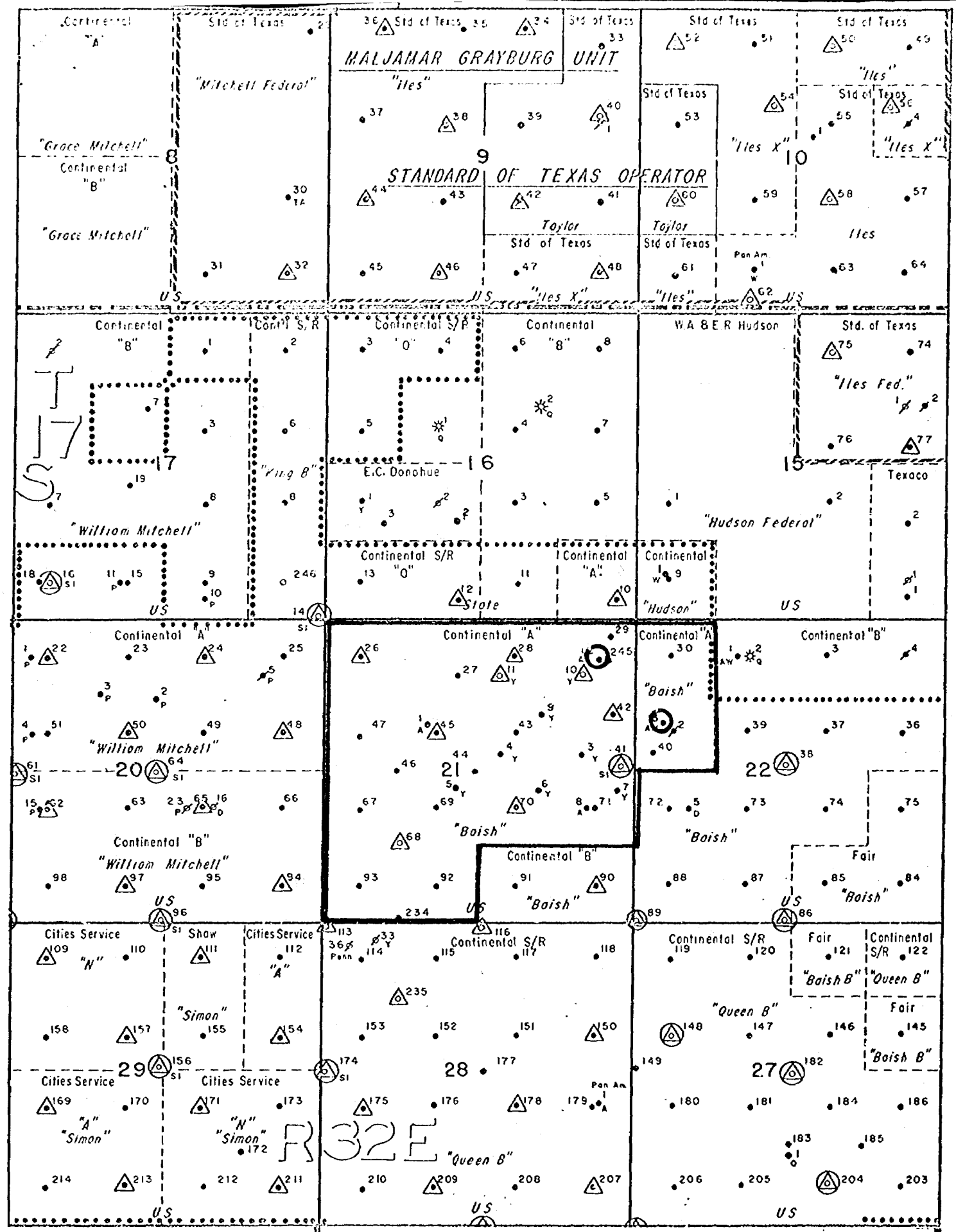


EXHIBIT NO. 1

CONTINENTAL OIL COMPANY

PRODUCTION DEPARTMENT

HOBBS DISTRICT

MALJAMAR POOL AREA

LEA COUNTIES, NEW MEXICO

- Grayburg-San Andres
- Queen
- Paddock
- Wolfcamp
- Devonian
- Abo
- Yates
- MCA Unit
- MCA Area
- Water injection
- Gas injection

SCALE

Dec 3 1965

DRAFT

GMH/esr
12-26-68

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. 3995

Order No. R-3645

APPLICATION OF CONTINENTAL 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 December 11, 1968, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this _____ day of December, 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, Continental Oil Company, is the owner and operator of the Baish "A" Wells Nos. 12 and 13, located, respectively, in Unit A of Section 21 and Unit E of Section 22, both in Township 17 South, Range 32 East, NMPM, Lea County, New Mexico.

(3) That each of the subject wells is presently dually completed for the production of oil from the Maljamar-Abo and Baish-Wolfcamp Pools through parallel strings of tubing.

(4) That the Baish "A" Well No. 12 is ~~presently~~ thought to be capable of producing approximately 40 barrels of oil per day from the Maljamar-Abo Pool and approximately 60 barrels of oil per day from the Baish-Wolfcamp Pool.

Findings

(12). That an artificial lift equipment has been installed in one of the subject zones in one well; that the other three zones are in need of artificial lift equipment; that a stabilized rate of production has not been established for any of the subject zones; therefore, production tests of either the Abo or Wolfcamp zones

(13) That production tests of either the Abo or Wolfcamp zones in each well should be conducted quarterly, and the productivity of each zone established; provided, however, that the Secretary-Director of the Commission may authorize annual production tests if he determines, on the basis of previous tests, that a stabilized rate of decline and production has been achieved in each zone, and that quarterly tests are no longer necessary to accurately determine and allocate production from each zone.

(5) That the Baish "A" Well No. 13 is ~~presently~~ thought to be capable of producing approximately 80 barrels of oil per day from the Maljamar-Abo Pool and approximately 70 barrels of oil per day from the Baish-Wolfcamp Pool.

(11) (3) That the marginal production from each zone in each of the subject wells must be artificially lifted.

(6) (4) That the applicant proposes to produce and to commingle in a single string of tubing the marginal oil production from the aforesaid pools in each of the subject wells by means of a ~~an Otis~~ Dual-Flow Downhole Choke Assembly without first measuring the production from each zone.

(7) (5) That the subject zones in each of the wells will remain separated by packers.

(8) (6) That the proposed commingling by means of dual-flow downhole choke assemblies may substantially extend the productive lives of each of the subject zones in ~~the~~ the subject wells.

(9) (7) That the ~~reservoir~~ fluid characteristics of each of the subject zones ~~in each of the subject wells~~ are such that ~~underground~~ waste would not be caused by the proposed commingling in the well-bores.

(10) (8) That the proposed commingling by means of dual-flow downhole choke assemblies may result in the recovery of additional oil from each of the subject zones in each of the subject wells, thereby preventing waste, and will not violate correlative rights.

Insert (12) & (13)

IT IS THEREFORE ORDERED:

(1) That the applicant, Continental Oil Company, is hereby authorized to complete its Baish "A" Well No. 12, located in Unit A of Section 21, Township 17 South, Range 32 East, NMPM, Lea County, New Mexico, in such a manner as to produce oil from the Maljamar-Abo Pool through perforations from 8905 feet to

9922 feet and from the Baish-Wolfcamp Pool through perforations from 9826 feet to 9882 feet, commingling the production from each of said zones in a single string of tubing by means of a dual-flow downhole choke assembly in accordance with Exhibit 9-A introduced in this case.

PROVIDED HOWEVER, that said commingling 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.

~~9[illegible]~~ feet and from the Baish-Wolfcamp Pool through perforations from 9797 feet to 9873 feet, commingling the production from each of said zones in a single string of tubing by means of a dual-flow downhole choke assembly in accordance with Exhibit Number 9-B introduced in this Case.

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

(5) That communication tests shall be conducted upon installation of each of the dual-flow downhole choke assemblies.

(6) That production tests of either the Abo or Wolfcamp zones in each well shall be conducted ~~annually.~~ quarterly and the productivity of the combined zones and of each zone thus established.

(7) That communication tests shall be conducted annually on each well.

(8) That the operator of the wells shall notify the District Supervisor, Oil Conservation Commission, Hobbs, New Mexico, of the date and time production tests are to be conducted and shall furnish a complete report of such tests to the Commission's Hobbs District Office.

(10) 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.

(9) That the Secretary-Director may authorize annual production tests to be determined, on the basis of previous tests, that a stabilized rate of decline and production has been achieved in each zone, and that quarterly tests are no longer necessary to ascertain determine and assign allowables from each zone.

(10)

Continental
in well-bore utilizing
commingle down-hole choke
eqpt.

Maljamar-Abo
Baish-WC

Baish "A" 12 A-21-17-32
13 E-22-17-32