CASE 3250: Application of AMERADA for pool rules for GOODWIN-ABO POOL, LEA COUNTY, NEW MEXICO.

CASE NO.
2250

Application,
Transcripts,
Small Exhibits
ETC.

GOVERNOR
JACK M. CAMPBELL
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

June 30, 1965

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

Re: Case No. 3250
Order No. R-2934
Applicant:

AMERADA PETROLEUM CORP.

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

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. 3250
Order No. R-2934

APPLICATION OF AMERADA PETROLEUM
CORPORATION FOR SPECIAL RULES FOR
THE GOODWIN-ABO POOL, LEA COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on May 26, 1965, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 30th day of June, 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, Amerada Petroleum Corporation, seeks the promulgation of special rules and regulations for the Goodwin-Abo Pool in Sections 30 and 31, Township 18 South, Range 37 East, NMPM, Lea County, New Mexico, including a provision for 80-acre proration units.

(3) That the applicant has not established that the wells in the Goodwin-Abo Pool can efficiently and economically drain and develop 80 acres or that the establishment of special rules and regulations would prevent the economic loss caused by the drilling of unnecessary wells, avoid the augmentation of risk arising from the drilling of an excessive number of wells, prevent

reduced recovery which might result from the drilling of too few wells, or otherwise prevent waste or protect correlative rights.

(4) That the subject application should be denied.

IT IS THEREFORE ORDERED:

(1) That the subject application is hereby denied.

(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

JACK M. CAMPBELL, Chairman

GUYTON B. HAYS, Member

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

esr/

GOVERNOR
JACK M. CAMPBELL
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

June 15, 1965

MEMORANDUM

TO: THE COMMISSION

FROM: DANIEL S. NUTTER, EXAMINER

SUBJECT: CASE NO. 3250

Case No. 3250 is the application of Amerada Petroleum Corporation for 80-acre spacing in the Goodwin-Abo Pool, Lea County, New Mexico.

This pool was discovered in 1962. The pool at present is a 3-well pool defined on three sides by dry holes and water wells. According to the presently known structure there may be one 40-acre location at the extreme south end of the pool.

The structure is so small that of the three presently completed wells, only one, the Continental GG-30 No. 2, could have 80 acres dedicated to it which could reasonably be presumed to be productive. The other wells have 40 or less productive acres. It is also doubtful if the proposed well would have more than 40 productive acres.

Inasmuch as development of the pool is virtually complete and the three existing wells have already paid out, and limited productive acreage is available for assignment to the existing wells, it appears that very little is to be served by going to 80-acre spacing at this time.

DANIEL S. NUTTER, EXAMINER

OIL CONSERVATION COMMISSION
P. O. BOX 2088
SANTA FE, NEW MEXICO

COPY

June 8, 1965

Dear Bob:

Enclosed is the transcript of Case No. 3250, which was your last appearance in Santa Fe as a representative of Amerada Petroleum Corporation. We thought you might like to have it for a souvenir.

I am sure that Mr. Porter and I could not have been more sincere when we told you that we had enjoyed working with you over the years and hoped that you would come back to see us occasionally.

Best of wishes to you and to Mrs. Christie in your new career.

Very truly yours,

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
May 26, 1965

EXAMINER HEARING

IN THE MATTER OF:

APPLICATION OF AMERADA PETROLEUM CORPORATION FOR SPECIAL RULES FOR THE GOODWIN-ABO POOL, LEA COUNTY, NEW MEXICO

Case No. 3250

This copy replaces the original which was sent to Bob Chenty on June 8, 1965

BEFORE:

DANIEL S. NUTTER

TRANSCRIPT OF HEARING

MR. NUTTER: Call Case Number 3250.

MR. DURRETT: Application of Amerada Petroleum Corporation for special rules for the Goodwin-Abo Pool, Lea

MR. NUTTER: Call Case Number 3250.

MR. DURRETT: Application of Amerada Petroleum Corporation for special rules for the Goodwin-Abo Pool, Lea County, New Mexico.

MR. KELLAHIN: If the Examiner please, Jason Kellahin of Kellahin & Fox, representing the applicant. I have two witnesses whom I would like to be sworn.

* * *

W A L L A C E W. S T E W A R T, sworn as a witness, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please.

A Wallace W. Stewart.

Q By whom are you employed, and in what position?

A Employed as a geologist for Amerada Petroleum Corporation.

Q And where are you located?

A In the Hobbs, New Mexico office.

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

A Yes, sir.

MR. KELLAHIN: Are the witness's qualifications acceptable?

MR. NUTTER: They are.

MR. KELLAHIN: Are you familiar with the application of Amerada in Case Number 3250?

A Yes, sir.

Q Briefly, what is proposed by Amerada in this application?

A Amerada is requesting the Goodwin-Abo field be assigned eighty-acre spacing for the present and future development.

Q The Goodwin-Abo Pool is a pool that has been defined by the Commission?

A This is true.

Q Referring to what has been marked Exhibit 1 for Amerada, would you identify that and discuss it, please.

A This is a structure contour map on top of the Abo formation. The wells colored in brown are those wells producing from the Abo formation, and I believe the exhibit is marked 18 South, 36 and 37 East.

Q Are there other wells located on the plat, drilled through the Abo formation?

A Yes, sir, there are three, or two.

Q Have the boundaries of the Goodwin-Abo Pool been fairly well defined by drilling?

A The boundaries are fairly well defined except on the

south end, by drilling.

Q And the plat information, or information contained on your plat, was obtained from either cores or logs of wells in the area?

A Yes.

Q Do you have logs on all the wells shown on the plat?

A Yes, sir.

Q And do you have any cores?

A We were able to obtain core analyses. We didn't look at the cores in each case, but two of the wells were cored through a portion of the pay. Also on the exhibit there is a line of cross-section which should be noted. It would be exhibit 2.

Q Is there anything you care to add in connection with Exhibit 1?

A No, sir.

Q Referring to what has been marked Exhibit 2, would you identify that and discuss it.

A This is a line of section from the southwest edge of the field; the dry holes, including the three Abo producers, and also an Abo dry hole in the northeast half of the field.

Q I believe the location of one of the wells on that exhibit is incorrect, is that right?

A That's right. At the last moment we discovered that the central well shows the location to be 660 south and 1650 west. This should read 660 south and 660 west. I believe it is correct on the other exhibit.

Q What is the name of that well?

A Continental Number 2 State GG 30.

Q Does the cross-section, in your opinion, show that this is a continuous reservoir through the area shown?

A Yes, it does.

Q What type of reservoir is the Abo?

A The Abo is a generally dolomite reservoir, very clean, fine chrystalline, gray to medium, and coarse chrystalline dolomites in the better zones of the pay. I might point out on the cross-section that it shows the intervals having been drill-stem tested. As per the legend on the left side of the center of the well, the cored intervals are in the center and the perforated intervals are on the right.

Q Now, based on your study of the logs and the core analyses available to you, and any other information available, in your opinion is this one common reservoir?

A I believe it is, sir.

Q And based on your studies, and your study of the lithography and cores and logs, in your opinion as a geologist will one well drain a development of eighty acres?

A Yes, sir.

Q Were Exhibits 1 and 2 prepared by you or under your supervision?

A They were.

MR. KELLAHIN: At this time I'd like to offer Exhibits 1 and 2.

MR. NUTTER: Applicant's Exhibits 1 and 2 will be admitted in evidence.

MR. KELLAHIN: That's all I have on direct.

MR. NUTTER: Are there any questions of Mr. Stewart? ... Mr. Stewart, what defines the pool as far as the north and west sides are concerned?

A On the west the most recent well, which is in the extreme southeast corner, the Graham State was drilled and found the Abo section to be entirely tight, not yielding fluid. Immediately south of this well is Continental's Number 2A36, which found the reef to be waterbearing. Also in Section 25 there is a low well--structurally low well, the Continental 25 Goodwin, which carried water in the Abo.

Q That's in the southwest of the northeast, minus 43-39?

A Yes, sir.

Q That was waterbearing?

A Yes, sir.

Q What about Continental's Goodwin 30 Numbers 1 and 2 on the north?

A The Number 1 encountered porosity very near the top, and they recovered water and the well was re-completed up the hole in the higher formation. The Number 2, in the very upper portion, about the upper thirty feet was apparently tight, and they did swab some oil and salt water, but that was also plugged back to a higher formation.

Q All right. What about the Continental G30-3?

A The 30--State GG 30 Number 3 was tight in approximately 100 to 115 feet of the Abo, and when they did encounter good porosity, apparently the operator felt that it might be too low to produce, and it wasn't tested; but it is considered to be a low well.

Q Would it be water productive, in all probability, if it were tested in that lower portion?

A In my opinion it would be, yes, sir.

Q Of the three wells completed in the Abo formation, by an examination of your structure here and the status of the various wells other than those three, how many of the three have eighty productive acres that could be assigned to the well?

A I believe that the Amerada well--present Amerada well could have at least an excess of forty acres, and approaching eighty. This is based on the fact that we might expect some

oil to the east of our location.

Q It would appear that that forty acres is in pretty nearly the same structural position as the Continental GG 30 Number 3?

A That is true.

Q Which wasn't productive?

A Yes, and Continental's locations--I don't know exactly how those would fit in--they do have acreage that could be assigned to the Number 2 well.

Q Are you referring to the forty-acre tract immediately north of the well?

A Right.

Q Is this Number 3 down here south of your Number 2 presently drilling?

A No, sir, it isn't. It's a location we plan to drill.

MR. NUTTER: Are there any further questions of Mr. Stewart?

MR. DURRETT: What are these wells presently making?

A Sir, I have--I believe they are all top allowable, but our engineer is prepared with that very specific data.

MR. DURRETT: Thank you--I'll ask him.

MR. NUTTER: Are there any further questions? ... The witness may be excused.

* * *

R. S. C H R I S T Y was sworn as a witness and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please.

A R. S. Christy.

Q By whom are you employed and in what position?

A I'm currently employed by Amerada Petroleum Corporation.

Q And that is until the end of the month?

A That's until the end of the month.

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

A Yes, I have.

MR. KELLAHIN: Are the witness's qualifications acceptable?

MR. NUTTER: Yes, sir.

MR. KELLAHIN: Mr. Christy, are you familiar with the application of Amerada Petroleum in Case Number 3250?

A Yes.

Q Have you made a study of the engineering problems involved in this application?

A Yes, sir.

Q Referring to what has been marked Amerada's Exhibit 3, would you identify that, please.

A Exhibit 3 is a plat showing the general location of the Goodwin-Abo Field with relation to surrounding development. It is in the northwest part of the Monument Pool and the Eumont Pool which is just northwest of the town of Monument. Tne Drinkard wells are shown as square and the Abo wells as circled, and all other wells are shallow wells either in the Eumont pay or the Newmont pay.

Q Actually there are only three Abo wells producing in this area?

A Yes.

Q Referring to what has been marked Exhibit 4 for Amerada, would you identify that and discuss it.

A Exhibit 4 is general data that is applicable to the field. That shows the date of the discovery well and the date of the orders delineating the field. The discovery well at the time it was delineated included the entire southwest quarter of Section 30, and when Amerada drilled their Number 2 State WME, it was brought into the field under a nomenclature case in, I believe, August 1963--no, it was November 1963. The allowable is set out as being the depth allowable for forty acres, which is 2.33 times the top allowable of 89 barrels; cumulative production for the field through February 1965 by

wells; and the initial reservoir pressure on each well has been completed in the Abo.

Q Do you attach any significance to this initial reservoir pressure?

A Yes, I think it is evident as each well is drilled following the discovery well, the reservoir pressure has declined; which indicates to me that there is communication from one well to another, and that it will drain areas in excess of forty acres.

Q Referring to Exhibit 5, would you identify that an discuss it.

A Exhibit 5 lists some reservoir data and some individual well data. We have valid reservoir data, and most of this was determined from electric logs. The porosity and permeability and water saturation was taken from sonic logs or logs on the WME Number 2. Initial reservoir pressure of 2,905 was the highest pressure obtained in the Continental State GG 30 Number 1, and it is a drill stem test pressure. The average gas-oil ratio for the field, based on oil and gas production for the month of February 1965, was 716 cubic feet per barrel. The formation volume factor is 1.205; bottom hole temperature 120; oil gravity 44 degrees. The next tabulation on this same exhibit is well data for individual wells. This gives the location, the elevation, top of the Abo, perforations for each

well, the total depth and the stimulation, completion date and the potential.

Q Referring to what has been marked Exhibit 6, would you identify that and discuss it.

A Exhibit 6 is a tabulation of the oil-water production for the Goodwin-Abo Field from discovery through February 1965. The total oil production for the discovery well, Continental State GG 30 Number 1, through that period, is 68,922 barrels. Water production was 78,769. The second well to be completed was the Continental Oil State GG 30 Number 2, and it had production from April 1963, and shows the cumulative through February 1965 of 54,483 barrels. This well has just started--for some time it made some water, and it appears, although I haven't checked, that they must have shut off the water in March 1964, producing very little water--about a barrel a day. Apparently it has started to increase again, because in the months of January and February the water increased to 248 for January and 280 for February.

Q Do you know whether that well has been re-completed or not?

A No.

Q Would it indicate that perhaps it has been?

A It would appear so from the production record, yes.

The third well, Amerada State WME Number 2, was completed in

August 1963 and the cumulative production through February of 1965 was 51,500 barrels; water production 8,066.

Q Referring to what has been marked Exhibit 7, would you identify that and discuss it, please.

A Exhibit 7 is simply a graphical interpretation of the tabulated oil-water production, and listed on there are the wells and the time they were completed, shown in red ink.

Q And Exhibit 8--would you identify it, please.

A I haven't got Exhibit 8 here. I don't know how the record shows this. What does the record indicate Exhibit 5 was?

MR. NUTTER: Reservoir data and well data, according to the record.

MR. CHRISTY: For Number 6 I must have given Number 7.

MR. KELLAHIN: Yes, Mr. Christy, in response to questions I think you got the wrong exhibits. Would you go back and identify and discuss Exhibit 6, please.

A Exhibit 6 is a tabulation of the various bottom hole pressures taken in the various Goodwin-Abo wells. I think I might point out that some of these pressures--the discovery well, Continental Oil Company State GG 30 Number 1, was completed in August of 1962 and the drill stem test pressure was 2,905, which I considered to be the reservoir pressure--initial

reservoir pressure of the pool. Another pressure was taken in September 1962. At that time the bottom hole pressure was 2,386 pounds after 188 hours shut-in, and the pressure was then extrapolated from buildup test, and had a pressure of 2,700. The next pressure was taken in October 1964 and pressure had declined through 1,220 pounds after 72-hour shut-in. I think it is probably obvious that it takes a long time to build up pressure in this particular well because it hadn't reached maximum in 188 hours in the previous test. As shown, the barrels of oil produced per pound dropped from the initial of 2,905 to the pressure taken in October 1964, which was a decline of 1,685 pounds, which would be equivalent to 37 barrels per pound drop. The second well completed, Continental Oil GG Number 2, had initial pressure of 2,883, which is some 22 pounds lower than the initial reservoir pressure about a year later. In July pressure was taken and showed a pressure of 2,794 pounds. In this well the pressure stabilized in 18 hours, which indicates very good permeability in this particular well. The third pressure was taken in October 1964 and pressure at that time was 2,540 pounds, for a total decline from April 1963 to October 1964 of 343 pounds, which would be equivalent to 128 barrels per pound drop. The third completed well is the Amerada State WME Number 2. Initial pressure in this well was extrapolated to 2,436. Here again we have a similar

permeability condition that was evidenced in Continental GG 30 Number 1, and a very slow build-up. As a matter of fact, after 401 hours pressure was only 2,292, and by extrapolating it from the build-up curve we obtained 426 pounds. Another pressure was taken in November and showed pressure of 1,498 pounds--that is, November 1964. Further pressure was taken in January 1965; it had a pressure of 1,371 pounds. Total decline from initial production to January 1965 was 1,065 pounds, or 44 barrels per pound drop.

Q Referring to Exhibit 7, Mr. Christy, have you discussed that exhibit yet?

A Yes, Exhibit 7 is the tabulation of oil-water production for all three wells.

Q And Exhibit 8?

A Exhibit 8 is a graphical interpretation of this--

Q This same information on Exhibit 7?

A Right.

Q What type drive exists in this reservoir?

A It would appear from the declining pressure, particularly in Continental State GG 30 Number 1 and Amerada State WME Number 2, that we have a very limited water drive; and I say "limited" because I think we do have some, as evidenced by the water production. The reason I think--one of the reasons why the pressure is higher in State GG 30 Number 2

of Continental is because of the much higher permeability--quite some permeability in excess of 1,000 millidarcies.

Q Are these wells on pump at the present time?

A They are all on a pump at this time. The Amerada well just went on pump this year, and I'm not sure how long the Continental Number 2 has been on pump, but the Number 1 has been on for some time.

Q Based on pressure data, in what state of depletion is this reservoir?

A It would appear to me from the declining pressures particularly in the two wells--I would expect those two wells particularly to be at least 50% depleted.

Q Based on your study of this reservoir, in your opinion will one well economically and efficiently drain in excess of eighty acres?

A Yes, I think it would.

Q What factors have you taken into consideration in arriving at this conclusion?

A In the first place, we know--we're pretty confident, at least, that we have had drainage from as far away on our well to Continental's GG 30 Number 1, which is in the northeast quarter of the southwest quarter of 30, and our well Number 2 State WMS is northwest of the northwest of Section 31. Of course, the production from Continental's State GG 30 Number 2

probably had some influence on our Number 2 also, so I think we have had pretty wide drainage in this reservoir.

Q Now, you heard Mr. Nutter's question of Mr. Stewart in regard to the acreage Continental could dedicate to its wells. Are you familiar with the GG 30 Number 3 well?

A I have no more information other than what Mr. Stewart has.

Q In your opinion, is this acreage definitely non-productive of oil?

A The information we have apparently indicates that there is no oil in that particular well bore, at least.

Q But is the whole acreage necessarily dry?

A I don't think you can say the whole forty acres is dry. I would also think or believe, since we have such good recovery from all three wells, that they are evidently draining better than forty acres; otherwise we wouldn't have as much production as we have.

Q Have you made any study of the economics of developing this acreage on eighty acres?

A Yes.

Q Would you give us that information.

A Based on the present allowable or actually the allowable in April, which was 38 barrels for forty acres, I have calculated that the payout for a forty-acre well would be

14.3 months. That is assuming, of course, that the allowable remains for the next twelve months; and with pressure dropping rather rapidly there might be some question that it would hold up its full allowable for that long. If you add another forty-acre factor to that, for eighty acres that would cut the payout time down to approximately 8/10 of a year, or 9-3/4 months.

Q Will one well on eighty acres adequately develop this pool?

A In my opinion, yes.

Q Is it necessary to drill a well on forty-acre spacing in order to recover all the oil in this--

A No, I don't think it would be economically feasible from here on to drill additional wells on forty-acre spacing.

Q Would that result in waste, to require drilling wells on forty-acre spacing?

A I think it would, economically at least. We have a location for Number 3, as pointed out earlier, and I think we would much rather drill that if we can get an eighty-acre allowable on it, because it would have a better chance of paying out. With the reservoir pressure down to 1,300 pounds now, it would--probably any wells drilled in the future would have much more payout than the ones drilled in the past.

Q Why do you say that--because of drainage that has already occurred?

A Yes.

Q Do you feel that the well Amerada has already drilled, drained acreage to the south of it, to some extent?

A Yes, I think so. I think we might expect to find bottom hole pressure in Number 3, if it is drilled, to be lower than the pressure in Number 2.

Q So that, of course, would affect the economics of Well Number 3?

A It certainly would.

Q Are you recommending to the Commission that definite well locations be included in your proposed eighty-acre order?

A With this type of structure, which appears to be sort of elongated and narrow, I think we need some flexibility, and we would recommend an order similar to the ~~El~~ Osudo order, which allows you to drill in either forty; and I'm not sure what it means when it says you can drill in both forties, but I assume it means if you want to drill two wells you could, on one eighty-acre allowable. Was that right?

MR. NUTTER: Yes, sir, that was the intent.

MR. CHRISTY: We would recommend an order similar to the Osudo order.

MR. KELLAHIN: Were Exhibits 3 through 8 prepared by you or under your supervision?

A Yes, sir.

MR. KELLAHIN: At this time I offer Applicant's Exhibits 3 through 8.

MR. NUTTER: Applicant's Exhibits 3 through 8 will be admitted in evidence.

MR. KELLAHIN: That's all I have of Mr. Christy.

MR. NUTTER: Does anyone have any questions of Mr. Christy?

MR. CHRISTY: Incidentally, the ~~El Sudo~~ Osudo order is Number R-2821.

MR. NUTTER: Is that the ~~El Sudo~~ Osudo Strawn?

MR. CHRISTY: That's the Wolfcamp--they have a similar one, I understand, for the Strawn also.

MR. NUTTER: Are there any further questions of Mr. Christy?

MR. CHRISTY: The order for the Strawn is Number R-2822.

MR. NUTTER: Just what are Amerada's plans at the present time for this location? Is that a firm location, as far as budget and so forth are concerned?

A Mr. Nutter, I believe the well is actually--has actually been authorized.

Q The FE has been put in and authorized?

A Yes. I also--to be frank, we are waiting until the order comes out before we start, but that doesn't mean we won't

drill if we get the forty-acre part.

Q What do you dedicate to that--the south half of the northwest of 31?

A Yes.

Q And presumably you would dedicate the north half of the northwest to Number 2?

A Yes.

Q In your opinion, is the north half of the northwest quarter of Section 31 productive of oil through that eighty-acre tract?

A I believe, from the structure on it as the geologist testified to, that the probabilities are very good that it could all be productive. I think--of course, one thing you have to take into consideration when you're talking about drainage is that that's not a square or rectangle. There may be some oil around these other tracts nobody is ever going to get if these wells are not drilled and produced, because they're not economical to drill, so that's the reason why you get better recovery from wells spaced on forty or eighty acres, because you're draining a lot more area than you give them credit for--they really have to, in order to get the oil they do.

Q Would you even consider drilling your well Number 3 in the northeast of the northwest, rather than the southwest

of the northwest?

A We think the present proposed location is a better gamble.

Q Much more attractive than the other forty?

A Yes.

Q The fact that the Continental GG 30 Number 1 and your Well Number 2 don't seem to build up to stabilized pressure within any kind of reasonable time doesn't particularly speak well for the drainage ability of the wells, does it?

A Well, it does for those two, I think, because they're fairly close together and it dropped rather rapidly. I think it indicates that there isn't very good communication between the Continental Number 2 and the other two wells, but I still think they are in the same reservoir.

Q And it also indicates that the Continental Number 1 and your Number 2 are both in a rather tight section?

A That's correct. This appears to be a fractured and tight Metrex reservoir, and after you have built up your fractured production--after it builds up pressure, then you start getting oil coming out of the Metrex, which is very tight.

Q This is a fractured formation?

A Yes.

Q Are each of the three wells presently completed in

the pool capable of making top allowable under eighty-acre proration units?

A I think Continental's Number 2, the State GG 30 and Amerada State WME Number 2 are capable of making an eighty-acre allowable. I would imagine--I would hazard a guess that the Continental State GG 30 Number 1 at this time could not now. There would appear to be some possibility of them going in there and shutting off some of that water; in that case they might be able to make eighty.

Q Their ratio is better than two to one on water and oil?

A Yes, and it has always produced a considerable amount of water--it's rather odd.

Q It's the lowest well in the pool, structurally?

A That's right, but I believe our information will show that it was perforated pretty close to the water table, and they may have some addicional productive capacity above the perforations that they could open up and shut off the water --I don't know.

Q The three wells in the pool at the present time have all paid out, as far as costs of drilling and completing them is concerned?

A Yes, sir.

Q So when you were referring to payout a while ago,

as far as payout is concerned the only one you would be concerned with would be this new location, the Number 3?

A Yes--any new wells would be involved in the payout.

MR. NUTTER: Are there any further questions of Mr. Christy?

MR. PORTER: Mr. Examiner, I don't have any questions but I have something I'd like to say, since this will be my last chance.

MR. CHRISTY: Is this off the record?

MR. PORTER: No, I think what I have to say should be part of the record. It came to my attention maybe a month ago that this would be Mr. Christy's last appearance here as an official representative of Amerada Petroleum Corporation, and certainly we're happy that Bob chose to come out and testify in this case himself, and give us an opportunity to visit with him again. Bob has actually been one of the most active of the industry people in New Mexico, and his career pretty closely parallels the significant producing history of New Mexiso, because he became acquainted with New Mexico during the old Hobbs pool days, and I believe he's been with the company for thirty-six years, and that pool is about thirty-six years old. I remember a number of years ago at a hearing down here with the Texas Railroad Commission to consider establishing common allowables in the Bronco pools, and ~~Jim~~ General

Thompson was presiding at that hearing, and he said he had seen Bob testify when he was a boy.

I haven't known Bob quite that long; our acquaintance goes back more than twenty years, and certainly during that twenty years Bob has rendered many services to this Oil Commission, for which we are certainly duly appreciative. We have thanked him at the time he performed these services; but I just want to say, Bob, that we certainly have appreciated all your contributions to conservation in this state. Bob has served on many industrial committees from 'way back in the Hobbs pool days, and perhaps most recent was the committee which considered revision of our forms. As a result of his working with other members of the committee and our staff, we made rather comprehensive changes in forms, and I believe we eliminated about three forms, and I think that's the most progress we ever made, Bob.

Certainly we hope you will get back to see us from time to time. We know you like Santa Fe and are sorry you couldn't get out here for your retirement--I mean come out here to live. I understand you're going to Texas. Certainly we have no argument with Texas; I know it will be good to do some fishing down there. Bob says he's never been proficient at fishing, but maybe he can concentrate more now.

Bob, it's been a pleasure to have associated with

you over all these years, and I know I speak for the Commission when I say we certainly appreciate it.

MR. CHRISTY: Thank you very much, Mr. Porter. There's not much more I can say--I think if I had my choice I would retire in New Mexico, and probably up here in Santa Fe, but for several reasons it won't work out that way.

I will say that in traveling around over the states Amerada operates in, and following proration matters and considering all the rules and regulations and laws, that I agree with your esteemed Governor when he made the talk the other day and said that New Mexico had the best set of rules and regulations and laws of any of the states producing oil; and certainly I agree with him. It's been a pleasure to come up here, and I know this is one state where you don't have to wait two or three years to get an order--and sometimes you don't even get an answer; we appreciate an answer, even if it's null, and some states don't even do that. I can certainly congratulate this state on their conservation, and I think it's doing a real fine job. With that, this case is closed.

MR. NUTTER: I want to say on behalf of myself and the staff of the Commission that we have enjoyed working with you over many long years, and we hope that, even though you don't come back as an official representative of Amerada, we will see you occasionally.

MR. CHRISTY: You can be sure I'm going to try to get up here occasionally.

MR. NUTTER: Does anyone have anything they wish to offer? Mr. Christy may be excused. Does anyone have anything to offer in Case Number 3250? We will take the case under advisement.

* * *

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ELIZABETH K. HALE, Notary Public and Court Reporter, do hereby certify that the proceedings in the foregoing case were taken and transcribed by me, and that the foregoing is a true and correct transcript of proceedings to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF, my hand and seal of office this 5th day of June, 1965.

Elizabeth K. Hale
Notary Public

My commission expires

May 23, 1968.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3250 heard by me on 5/26, 1965.

....., Examiner
New Mexico Oil Conservation Commission

Case 325

AMERADA PETROLEUM CORPORATION
P. O. BOX 2040
TULSA, OKLAHOMA 74102

LEGAL DEPARTMENT

May 4, 1965

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

Attention: Mr. D. S. Nutter
Chief Engineer

'65 MAY 6 AM

Gentlemen:

Enclosed are the original and two copies of Amerada's application for the establishment of 80-acre proration units and other special pool rules for the Goodwin-Abo Pool in Lea County, New Mexico.

Please set this matter for hearing before the Commission on May 26, 1965.

Yours very truly,

Thomas W. Lynch

THOMAS W. LYNCH
Attorney

DOCKET MAILED
Date 5-12-65

TWL:ac
Enclosures
cc: Mr. Jason W. Kellahin w/encl.
Kellahin & Fox
P. O. Box 1769
Santa Fe, New Mexico 87501

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

APPLICATION OF AMERADA PETROLEUM CORPORATION)
FOR THE ESTABLISHMENT OF 80-ACRE PRORATION)
UNITS AND OTHER SPECIAL RULES FOR THE GOODWIN-) CASE NO. 3250
ABO POOL LOCATED IN THE SW/4 SECTION 30 AND)
THE NW/4 SECTION 31, TOWNSHIP 18 SOUTH, RANGE)
37 EAST, LEA COUNTY, NEW MEXICO.)

'65 MAY 6 AM

APPLICATION

Applicant Amerada Petroleum Corporation states that:

1. Applicant operates the State WM "E" Well No. 2, located in the NW/4 NW/4 Section 30-18S-37E, Lea County, New Mexico.

2. The well is completed in the Goodwin-Abo Pool which was defined by Order Nos. 2363 and 2578 as underlying the SW/4 Section 30 and the NW/4 Section 31, Township 18 South, Range 37 East, Lea County, New Mexico.

3. One well in the Goodwin-Abo Pool is capable of efficiently and economically draining a minimum of 80 acres.

4. The establishment of 80-acre proration units for the Goodwin-Abo Pool as above defined will prevent waste and the drilling of unnecessary wells, and will protect correlative rights.

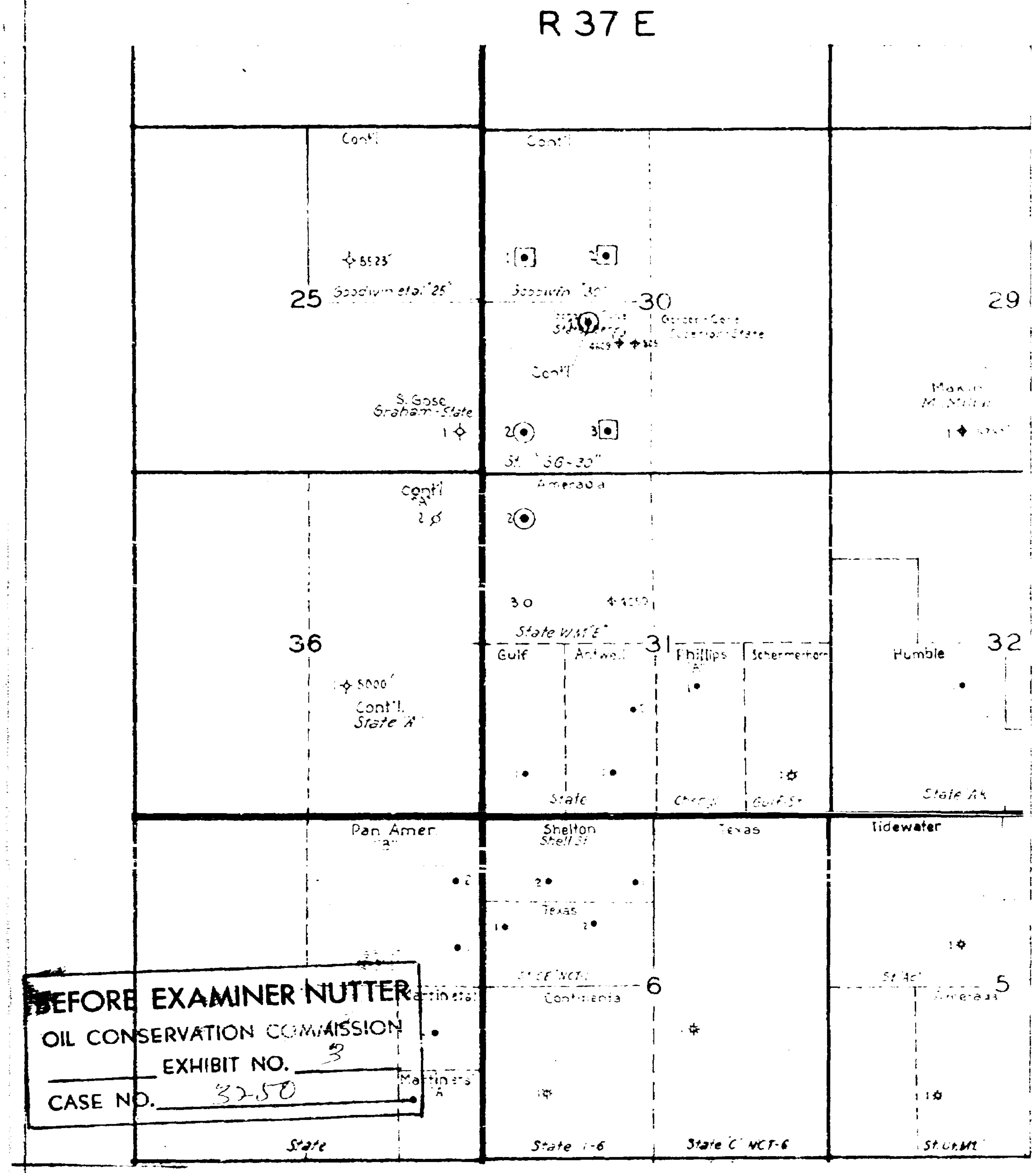
5. The Commission should establish 80-acre proration units and such other special rules as may be appropriate in view of the evidence adduced at the hearing on this application.

Applicant therefore requests that this matter be set for hearing by the Commission on May 26, 1965, that notice thereof be given as required by law, and that upon conclusion of such hearing an order be entered granting this application.

AMERADA PETROLEUM CORPORATION

By Thomas W. Lynch
Thomas W. Lynch, Attorney

Resident Counsel:
Jason W. Kellahin
Kellahin & Fox
P. O. Box 1769
Santa Fe, New Mexico 87501



BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 3
CASE NO. 3250

N.W. MONUMENT AREA
LEA COUNTY, NEW MEXICO

[■] *DRINKARD*
(●) *ABO*

SCALE 1 INCH = 2000 FEET

5-20-65

GOODWIN ABO POOL

General Data

Goodwin Abo Pool was established December 1, 1962 by Order No. R-2365.

Discovery Well - Continental Oil Company State "GG-30" No. 1, SW/4 Unit K Sec. 30-T18S-R37E, completed August 23, 1962. State "GG-30" No. 2 completed April 14, 1963.

Pool extended by Order No. R-2578 dated November 1, 1963 as a result of the completion of Amerada Petroleum Corporation's State WM "E" No. 2, NW/4 Unit D Sec. 31-T18S-R37E, completed in August 1963. Total completions, 3.

Depth factor 2.33 (7000-8000'). Top allowable (May 1965) 89 bbls.

Cumulative production to 3-1-65:

Conoco State "GG-30" No. 1	68,922 bbls.
Conoco State "GG-30" No. 2	54,483 "
Amerada State WM "E" No. 2	51,500 "
Field Total	174,905 bbls.

Initial Reservoir Pressure Conoco State "GG-30" No. 1, DST 7410-7500' - 2905#.
Initial Reservoir Pressure Conoco State "GG-30" No. 2, DST 7340-7468' - 2883#.
Initial Reservoir Pressure Amerada State WM "E" No. 2, Gauge @ 7455' - 2436#.

GOODWIN ABO FIELD

Reservoir Data

Formation:	Abo Reef
Porosity	7.36% (Calculated from Sonic Log - Amerada State WM "E" No. 2
Permeability:	19 md (Calculated from Build-Up Tests - Amerada State WM "E" No. 2
Water Saturation:	37.5% (Calculated from Electric Log - Amerada State WM "E" No. 2
Initial Reservoir Pressure:	2905 psi (Conoco State "GG-30" No. 1)
Average GOR:	716 cu ft/bbl (February 1965 Production)
FVF:	1.205
BHT:	120°
Oil Gravity:	44°

Well Data

	Conoco State "GG-30" No. 1	Conoco State "GG-30" No. 2	Amerada State WM "E" No. 2
Location	Unit K Sec.30-18S-37E	Unit M Sec.30-18S-37E	Unit D Sec.31-18S-37E
Elevation	3755'	3748'	3749'
Top Abo	7460' (-3705')	7253' (-3505')	7284' (-3535')
Perforations	7477-7490'	7328-32'; 7390-94'; 7415'; 7419'; 7426-36'	7354-7449'
Total Depth	7732'	7581'	7460'
Stimulation	500 gal Acid	4000 gal Acid	500 gal Mud Acid
Completion Date	8-23-62	4-14-63	8-8-63
Potential	215 BO + 19 BW - 15/64" Ch GOR 206; TP 275-300#	620 BO - 28/64" Ch GOR 582; TP 180#	47 BO - 3 Hours - 20/64" Ch GOR 433; TP 300#

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 5
CASE NO. 3256

KELLAHIN AND FOX
ATTORNEYS AT LAW
54½ EAST SAN FRANCISCO STREET
P. O. BOX 1769
SANTA FE, NEW MEXICO 87501

June 8, 1965

Mr. Daniel S. Nutter
Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico

Re: Case No. 3250

Dear Dan:

Enclosed is the original of Exhibit 6, submitted in the above case by Amerada Petroleum Corporation. Bob Christie inadvertently carried it off into retirement with him, but discovered it and sent it back to me.

I hope it hasn't been needed.

Very truly yours,

KELLAHIN & FOX

Jason W. Kellahin

jwk/mas
enclosure

GOODWIN ABO FIELD

Reservoir Pressure - Production Data

Continental Oil Company State "GG-30" No. 1:	Initial BHP 2905# DST August 1962. Pressure @ 7497' - 2386# after 188 hours SI September 1962. Extrapolated to maximum pressure of 2700#. Pressure @ 7476' - 1220# after 72 hours SI October 1964. Decline from August 1962 to October 1964 - 1685#. Production for period 61,538 barrels. 61,538 ÷ 1685# = 37 barrels per pound drop.
Continental Oil Company State "GG-30" No. 2:	Initial BHP 2883# DST April 1963. Pressure @ 7402' - 2794#. Pressure stabilized in 18 hours, taken July 1963. Pressure @ 7266' - 2540# 72 hours SI October 1964. Decline from April 1963 to October 1964 - 343#. Production for period - 43,900 barrels. 43,900 ÷ 343# = 128 barrels per pound drop.
Amerada Petroleum Corp. State WM "E" No. 2	Initial BHP 2292# Gauge @ 7455' after 401 hours SI. Extrapolated to 2436# September 1963. Pressure @ 7335' - 1498#, 120 hours SI November 1964. Pressure @ 7335' - 1371#, 52 hours SI January 1965. Decline from September 1963 to January 1965 - 1065#. Production for period - 47,180 barrels. 47,180 ÷ 1065# = 44 barrels per pound drop.

GOODWIN ABO FIELD
OIL AND WATER PRODUCTION

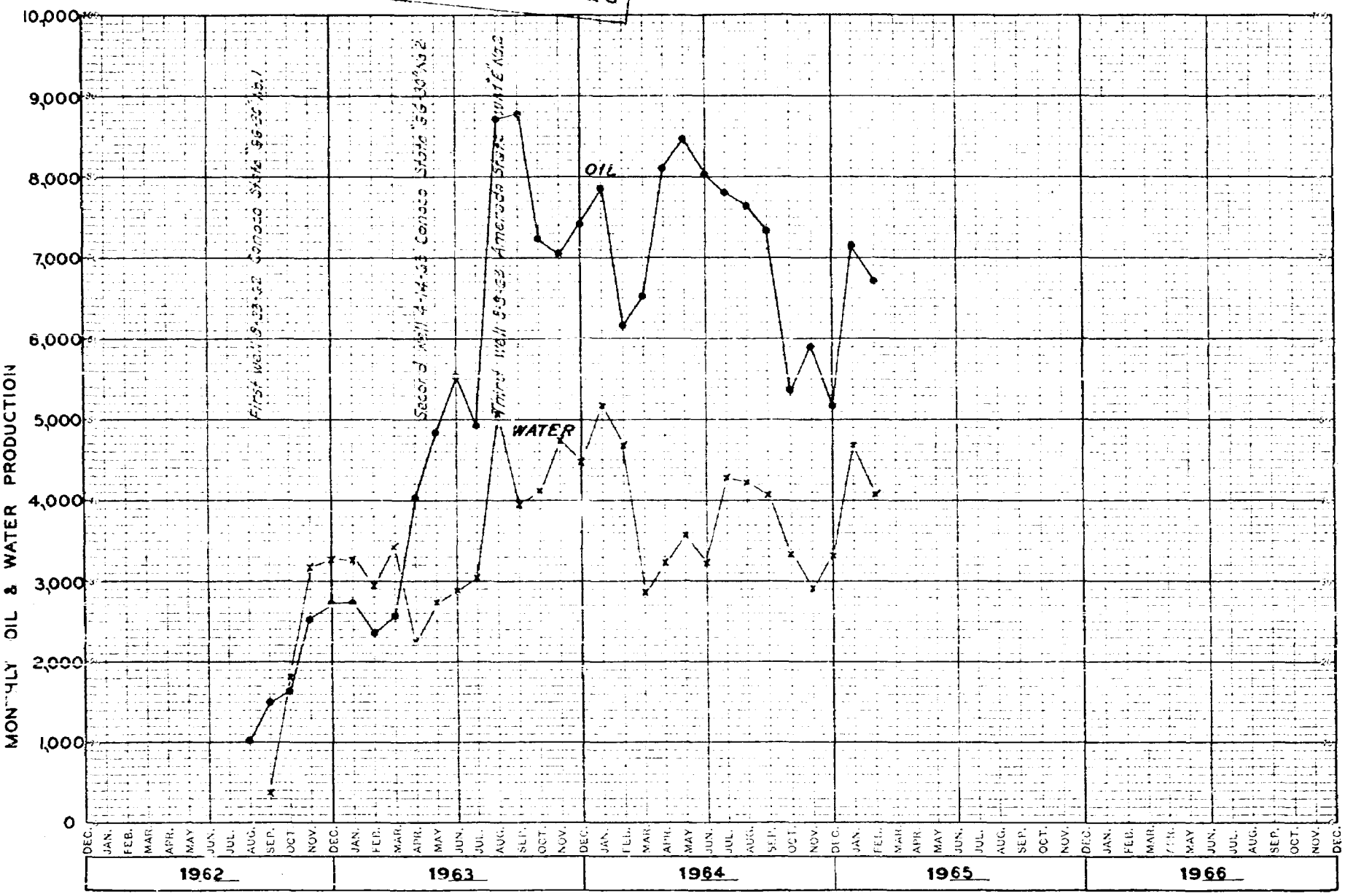
	CONTINENTAL OIL CO. State "GG-30" No. 1		CONTINENTAL OIL CO. State "GG-30" No. 2		AMERADA PETR. CORP. State WM "E" No. 2	
	OIL	WATER	OIL	WATER	OIL	WATER
1962						
Aug.	1,023					
Sept.	1,507	377				
Oct.	1,629	1,800				
Nov.	2,514	3,180				
Dec.	2,718	3,286				
Total	9,391	8,643				
1963						
Jan.	2,734	3,286				
Feb.	2,368	2,950				
March	2,580	3,410				
April	2,520	2,268	1,501			
May	2,352	2,352	2,502	372		
June	2,772	2,520	2,772	360		
July	2,759	1,240	2,161	1,794		
Aug.	3,164	2,604	3,164	2,480	2,397	
Sept.	2,828	2,400	2,828	1,560	3,122	
Oct.	2,125	2,240	2,124	1,870	2,990	
Nov.	2,104	2,250	2,105	2,490	2,841	
Dec.	2,311	2,480	2,310	2,015	2,802	
Total	30,617	30,000	21,467	12,941	14,152	
1964						
Jan.	2,590	2,635	2,591	2,325	2,671	232
Feb.	1,732	2,320	1,731	2,175	2,705	204
March	1,855	2,635	1,856	25	2,811	212
April	2,773	3,000	2,773	30	2,555	192
May	2,820	3,379	2,819		2,845	214
June	2,681	3,000	2,682	30	2,678	202
July	2,541	3,348	2,541	31	2,718	906
Aug.	2,436	3,255	2,437	31	2,756	919
Sept.	2,102	3,180	2,610	30	2,616	872
Oct.	1,350	2,574	1,808	30	2,215	738
Nov.	1,461	1,840	2,001	240	2,459	820
Dec.	1,418	2,352	1,986	31	2,778	926
Total	25,759	33,518	27,835	4,978	31,807	6,437
1965						
Jan.	1,735	3,472	2,511	248	2,915	972
Feb.	1,420	3,136	2,670	280	2,626	657
Total	3,155	6,608	5,181	528	5,541	1,629
CUM.	68,922	78,769	54,483	18,447	51,500	8,066

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 7
CASE NO. 3050

NO. 31 120. FIVE YEARS BY MONTHS X 100 DIVISIONS.

CODEX BOOK COMPANY, INC. NORWOOD, MASSACHUSETTS.
PRINTED IN U. S. A.

GOODWIN ABO FIELD



GOODWIN ABO FIELD
OIL AND WATER PRODUCTION

	CONTINENTAL OIL CO. State "GG-30" No. 1		CONTINENTAL OIL CO. State "GG-30" No. 2		AMERADA PETR. CORP. State WM "E" No. 2	
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June	2,772	2,520	2,772	360		
July	2,759	1,240	2,161	1,794		
Aug.	3,164	2,604	3,164	2,480	2,397	
Sept.	2,828	2,400	2,828	1,560	3,122	
Oct.	2,125	2,240	2,124	1,870	2,990	
Nov.	2,104	2,250	2,105	2,490	2,841	
Dec.	2,311	2,480	2,310	2,015	2,802	
Total	30,617	30,000	21,467	12,941	14,152	
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Total	3,155	6,608	5,181	528	5,541	1,629
CUM.	68,922	78,769	54,483	18,447	51,500	8,066

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
May 26, 1965

EXAMINER HEARING

IN THE MATTER OF:

APPLICATION OF AMERADA PETROLEUM CORPORATION FOR SPECIAL RULES FOR THE GOODWIN-ABO POOL, LEA COUNTY, NEW MEXICO

Case No. 3250

BEFORE:

DANIEL S. NUTTER

TRANSCRIPT OF HEARING

MR. NUTTER: Call Case Number 3250.

MR. DURRETT: Application of Amerada Petroleum Corporation for special rules for the Goodwin-Abo Pool, Lea County, New Mexico.

MR. KELLAHIN: If the Examiner please, Jason Kellahin of Kellahin & Fox, representing the applicant. I have two witnesses whom I would like to be sworn.

* * *

W A L L A C E W. S T E W A R T, sworn as a witness, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please.

A Wallace W. Stewart.

Q By whom are you employed, and in what position?

A Employed as a geologist for Amerada Petroleum Corporation.

Q And where are you located?

A In the Hobbs, New Mexico office.

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

A Yes, sir.

MR. KELLAHIN: Are the witness's qualifications acceptable?

MR. NUTTER: They are.

MR. KELLAHIN: Are you familiar with the application of Amerada in Case Number 3250?

A Yes, sir.

Q Briefly, what is proposed by Amerada in this application?

A Amerada is requesting the Goodwin-Abo field be assigned eighty-acre spacing for the present and future development.

Q The Goodwin-Abo Pool is a pool that has been defined by the Commission?

A This is true.

Q Referring to what has been marked Exhibit 1 for Amerada, would you identify that and discuss it, please.

A This is a structure contour map on top of the Abo formation. The wells colored in brown are those wells producing from the Abo formation, and I believe the exhibit is marked 18 South, 36 and 37 East.

Q Are there other wells located on the plat, drilled through the Abo formation?

A Yes, sir, there are three, or two.

Q Have the boundaries of the Goodwin-Abo Pool been fairly well defined by drilling?

A The boundaries are fairly well defined except on the

south end, by drilling.

Q And the plat information, or information contained on your plat, was obtained from either cores or logs of wells in the area?

A Yes.

Q Do you have logs on all the wells shown on the plat?

A Yes, sir.

Q And do you have any cores?

A We were able to obtain core analyses. We didn't look at the cores in each case, but two of the wells were cored through a portion of the pay. Also on the exhibit there is a line of cross-section which should be noted. It would be exhibit 2.

Q Is there anything you care to add in connection with Exhibit 1?

A No, sir.

Q Referring to what has been marked Exhibit 2, would you identify that and discuss it.

A This is a line of section from the southwest edge of the field; the dry holes, including the three Abo producers, and also an Abo dry hole in the northeast half of the field.

Q I believe the location of one of the wells on that exhibit is incorrect, is that right?

A That's right. At the last moment we discovered that the central well shows the location to be 660 south and 1650 west. This should read 660 south and 660 west. I believe it is correct on the other exhibit.

Q What is the name of that well?

A Continental Number 2 State GG 30.

Q Does the cross-section, in your opinion, show that this is a continuous reservoir through the area shown?

A Yes, it does.

Q What type of reservoir is the Abo?

A The Abo is a generally dolomite reservoir, very clean, fine chrystalline, gray to medium, and coarse chrystalline dolomites in the better zones of the pay. I might point out on the cross-section that it shows the intervals having been drill-stem tested. As per the legend on the left side of the center of the well, the cored intervals are in the center and the perforated intervals are on the right.

Q Now, based on your study of the logs and the core analyses available to you, and any other information available, in your opinion is this one common reservoir?

A I believe it is, sir.

Q And based on your studies, and your study of the lithography and cores and logs, in your opinion as a geologist will one well drain a development of eighty acres?

A Yes, sir.

Q Were Exhibits 1 and 2 prepared by you or under your supervision?

A They were.

MR. KELLAHIN: At this time I'd like to offer Exhibits 1 and 2.

MR. NUTTER: Applicant's Exhibits 1 and 2 will be admitted in evidence.

MR. KELLAHIN: That's all I have on direct.

MR. NUTTER: Are there any questions of Mr. Stewart? ... Mr. Stewart, what defines the pool as far as the north and west sides are concerned?

A On the west the most recent well, which is in the extreme southeast corner, the Graham State was drilled and found the Abo section to be entirely tight, not yielding fluid. Immediately south of this well is Continental's Number 2A36, which found the reef to be waterbearing. Also in Section 25 there is a low well--structura ly low well, the Continental 25 Goodwin, which carried water in the Abo.

Q That's in the southwest of the northeast, minus 43-39?

A Yes, sir.

Q That was waterbearing?

A Yes, sir.

Q What about Continental's Goodwin 30 Numbers 1 and 2 on the north?

A The Number 1 encountered porosity very near the top, and they recovered water and the well was re-completed up the hole in the higher formation. The Number 2, in the very upper portion, about the upper thirty feet was apparently tight, and they did swab some oil and salt water, but that was also plugged back to a higher formation.

Q All right. What about the Continental G30-3?

A The 30--State GG 30 Number 3 was tight in approximately 100 to 115 feet of the Abo, and when they did encounter good porosity, apparently the operator felt that it might be too low to produce, and it wasn't tested; but it is considered to be a low well.

Q Would it be water productive, in all probability, if it were tested in that lower portion?

A In my opinion it would be, yes, sir.

Q Of the three wells completed in the Abo formation, by an examination of your structure here and the status of the various wells other than those three, how many of the three have eighty productive acres that could be assigned to the well?

A I believe that the Amerada well--present Amerada well could have at least an excess of forty acres, and approaching eighty. This is based on the fact that we might expect some

oil to the east of our location.

Q It would appear that that forty acres is in pretty nearly the same structural position as the Continental GG 30 Number 3?

A That is true.

Q Which wasn't productive?

A Yes, and Continental's locations--I don't know exactly how those would fit in--they do have acreage that could be assigned to the Number 2 well.

Q Are you referring to the forty-acre tract immediately north of the well?

A Right.

Q Is this Number 3 down here south of your Number 2 presently drilling?

A No, sir, it isn't. It's a location we plan to drill.

MR. NUTTER: Are there any further questions of Mr. Stewart?

MR. DURRETT: What are these wells presently making?

A Sir, I have--I believe they are all top allowable, but our engineer is prepared with that very specific data.

MR. DURRETT: Thank you--I'll ask him.

MR. NUTTER: Are there any further questions? ... The witness may be excused.

* * *

R. S. C H R I S T Y was sworn as a witness and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please.

A R. S. Christy.

Q By whom are you employed and in what position?

A I'm currently employed by Amerada Petroleum Corporation.

Q And that is until the end of the month?

A That's until the end of the month.

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

A Yes, I have.

MR. KELLAHIN: Are the witness's qualifications acceptable?

MR. NUTTER: Yes, sir.

MR. KELLAHIN: Mr. Christy, are you familiar with the application of Amerada Petroleum in Case Number 3250?

A Yes.

Q Have you made a study of the engineering problems involved in this application?

A Yes, sir.

Q Referring to what has been marked Amerada's Exhibit 3, would you identify that, please.

A Exhibit 3 is a plat showing the general location of the Goodwin-Abo Field with relation to surrounding development. It is in the northwest part of the Monument Pool and the Eumont Pool which is just northwest of the town of Monument. The Drinkard wells are shown as square and the Abo wells as circled, and all other wells are shallow wells either in the Eumont pay or the Newmont pay.

Q Actually there are only three Abo wells producing in this area?

A Yes.

Q Referring to what has been marked Exhibit 4 for Amerada, would you identify that and discuss it.

A Exhibit 4 is general data that is applicable to the field. That shows the date of the discovery well and the date of the orders delineating the field. The discovery well at the time it was delineated included the entire southwest quarter of Section 30, and when Amerada drilled their Number 2 State WME, it was brought into the field under a nomenclature case in, I believe, August 1963--no, it was November 1963. The allowable is set out as being the depth allowable for forty acres, which is 2.33 times the top allowable of 89 barrels; cumulative production for the field through February 1965 by

wells; and the initial reservoir pressure on each well has been completed in the Abo.

Q Do you attach any significance to this initial reservoir pressure?

A Yes, I think it is evident as each well is drilled following the discovery well, the reservoir pressure has declined; which indicates to me that there is communication from one well to another, and that it will drain areas in excess of forty acres.

Q Referring to Exhibit 5, would you identify that and discuss it.

A Exhibit 5 lists some reservoir data and some individual well data. We have valid reservoir data, and most of this was determined from electric logs. The porosity and permeability and water saturation was taken from sonic logs or logs on the WME Number 2. Initial reservoir pressure of 2,905 was the highest pressure obtained in the Continental State GG 30 Number 1, and it is a drill stem test pressure. The average gas-oil ratio for the field, based on oil and gas production for the month of February 1965, was 716 cubic feet per barrel. The formation volume factor is 1.205; bottom hole temperature 120; oil gravity 44 degrees. The next tabulation on this same exhibit is well data for individual wells. This gives the location, the elevation, top of the Abo, perforations for each

well, the total depth and the stimulation, completion date and the potential.

Q Referring to what has been marked Exhibit 6, would you identify that and discuss it.

A Exhibit 6 is a tabulation of the oil-water production for the Goodwin-Abo Field from discovery through February 1965. The total oil production for the discovery well, Continental State GG 30 Number 1, through that period, is 68,922 barrels. Water production was 78,769. The second well to be completed was the Continental Oil State GG 30 Number 2, and it had production from April 1963, and shows the cumulative through February 1965 of 54,483 barrels. This well has just started--for some time it made some water, and it appears, although I haven't checked, that they must have shut off the water in March 1964, producing very little water--about a barrel a day. Apparently it has started to increase again, because in the months of January and February the water increased to 248 for January and 290 for February.

Q Do you know whether that well has been re-completed or not?

A No.

Q Would it indicate that perhaps it has been?

A It would appear so from the production record, yes. The third well, Amerada State WME Number 2, was completed in

August 1963 and the cumulative production through February of 1965 was 51,500 barrels; water production 8,066.

Q Referring to what has been marked Exhibit 7, would you identify that and discuss it, please.

A Exhibit 7 is simply a graphical interpretation of the tabulated oil-water production, and listed on there are the wells and the time they were completed, shown in red ink.

Q And Exhibit 8--would you identify it, please.

A I haven't got Exhibit 8 here. I don't know how the record shows this. What does the record indicate Exhibit 5 was?

MR. NUTTER: Reservoir data and well data, according to the record.

MR. CHRISTY: For Number 6 I must have given Number 7.

MR. KELLAHIN: Yes, Mr. Christy, in response to questions I think you got the wrong exhibits. Would you go back and identify and discuss Exhibit 6, please.

A Exhibit 6 is a tabulation of the various bottom hole pressures taken in the various Goodwin-Abo wells. I think I might point out that some of these pressures--the discovery well, Continental Oil Company State GG 30 Number 1, was completed in August of 1962 and the drill stem test pressure was 2,905, which I considered to be the reservoir pressure--initial

reservoir pressure of the pool. Another pressure was taken in September 1962. At that time the bottom hole pressure was 2,386 pounds after 188 hours shut-in, and the pressure was then extrapolated from buildup test, and had a pressure of 2,700. The next pressure was taken in October 1964 and pressure had declined through 1,220 pounds after 72-hour shut-in. I think it is probably obvious that it takes a long time to build up pressure in this particular well because it hadn't reached maximum in 188 hours in the previous test. As shown, the barrels of oil produced per pound dropped from the initial of 2,905 to the pressure taken in October 1964, which was a decline of 1,685 pounds, which would be equivalent to 37 barrels per pound drop. The second well completed, Continental Oil GG Number 2, had initial pressure of 2,883, which is some 22 pounds lower than the initial reservoir pressure about a year later. In July pressure was taken and showed a pressure of 2,794 pounds. In this well the pressure stabilized in 18 hours, which indicates very good permeability in this particular well. The third pressure was taken in October 1964 and pressure at that time was 2,540 pounds, for a total decline from April 1963 to October 1964 of 343 pounds, which would be equivalent to 128 barrels per pound drop. The third completed well is the Amerada State WME Number 2. Initial pressure in this well was extrapolated to 2,436. Here again we have a similar

permeability condition that was evidenced in Continental GG 30 Number 1, and a very slow build-up. As a matter of fact, after 401 hours pressure was only 2,292, and by extrapolating it from the build-up curve we obtained 426 pounds. Another pressure was taken in November and showed pressure of 1,498 pounds--that is, November 1964. Further pressure was taken in January 1965; it had a pressure of 1,371 pounds. Total decline from initial production to January 1965 was 1,065 pounds, or 44 barrels per pound drop.

Q Referring to Exhibit 7, Mr. Christy, have you discussed that exhibit yet?

A Yes, Exhibit 7 is the tabulation of oil-water production for all three wells.

Q And Exhibit 8?

A Exhibit 8 is a graphical interpretation of this--

Q This same information on Exhibit 7?

A Right.

Q What type drive exists in this reservoir?

A It would appear from the declining pressure, particularly in Continental State GG 30 Number 1 and Amerada State WME Number 2, that we have a very limited water drive; and I say "limited" because I think we do have some, as evidenced by the water production. The reason I think--one of the reasons why the pressure is higher in State GG 30 Number 2

of Continental is because of the much higher permeability--quite some permeability in excess of 1,000 millidarcies.

Q Are these wells on pump at the present time?

A They are all on a pump at this time. The Amerada well just went on pump this year, and I'm not sure how long the Continental Number 2 has been on pump, but the Number 1 has been on for some time.

Q Based on pressure data, in what state of depletion is this reservoir?

A It would appear to me from the declining pressures, particularly in the two wells--I would expect those two wells particularly to be at least 50% depleted.

Q Based on your study of this reservoir, in your opinion will one well economically and efficiently drain in excess of eighty acres?

A Yes, I think it would.

Q What factors have you taken into consideration in arriving at this conclusion?

A In the first place, we know--we're pretty confident, at least, that we have had drainage from as far away on our well to Continental's GG 30 Number 1, which is in the northeast quarter of the southwest quarter of 30, and our well Number 2 State WMS is northwest of the northwest of Section 31. Of course, the production from Continental's State GG 30 Number 2

probably had some influence on our Number 2 also, so I think we have had pretty wide drainage in this reservoir.

Q Now, you heard Mr. Nutter's question of Mr. Stewart in regard to the acreage Continental could dedicate to its wells. Are you familiar with the GG 30 Number 3 well?

A I have no more information other than what Mr. Stewart has.

Q In your opinion, is this acreage definitely non-productive of oil?

A The information we have apparently indicates that there is no oil in that particular well bore, at least.

Q But is the whole acreage necessarily dry?

A I don't think you can say the whole forty acres is dry. I would also think or believe, since we have such good recovery from all three wells, that they are evidently draining better than forty acres; otherwise we wouldn't have as much production as we have.

Q Have you made any study of the economics of developing this acreage on eighty acres?

A Yes.

Q Would you give us that information.

A Based on the present allowable or actually the allowable in April, which was 38 barrels for forty acres, I have calculated that the payout for a forty-acre well would be

14.3 months. That is assuming, of course, that the allowable remains for the next twelve months; and with pressure dropping rather rapidly there might be some question that it would hold up its full allowable for that long. If you add another forty-acre factor to that, for eighty acres that would cut the payout time down to approximately 8/10 of a year, or 9-3/4 months.

Q Will one well on eighty acres adequately develop this pool?

A In my opinion, yes.

Q Is it necessary to drill a well on forty-acre spacing in order to recover all the oil in this--

A No, I don't think it would be economically feasible from here on to drill additional wells on forty-acre spacing.

Q Would that result in waste, to require drilling wells on forty-acre spacing?

A I think it would, economically at least. We have a location for Number 3, as pointed out earlier, and I think we would much rather drill that if we can get an eighty-acre allowable on it, because it would have a better chance of paying out. With the reservoir pressure down to 1,300 pounds now, it would--probably any wells drilled in the future would have much more payout than the ones drilled in the past.

Q Why do you say that--because of drainage that has already occurred?

A Yes.

Q Do you feel that the well Amerada has already drilled, drained acreage to the south of it, to some extent?

A Yes, I think so. I think we might expect to find bottom hole pressure in Number 3, if it is drilled, to be lower than the pressure in Number 2.

Q So that, of course, would affect the economics of Well Number 3?

A It certainly would.

Q Are you recommending to the Commission that definite well locations be included in your proposed eighty-acre order?

A With this type of structure, which appears to be sort of elongated and narrow, I think we need some flexibility, and we would recommend an order similar to the ~~El~~ Sudo order, which allows you to drill in either forty; and I'm not sure what it means when it says you can drill in both forties, but I assume it means if you want to drill two wells you could, on one eighty-acre allowable. Was that right?

MR. NUTTER: Yes, sir, that was the intent.

MR. CHRISTY: We would recommend an order similar to the El Sudo order.

MR. KELLAHIN: Were Exhibits 3 through 8 prepared by you or under your supervision?

A Yes, sir.

MR. KELLAHIN: At this time I offer Applicant's Exhibits 3 through 8.

MR. NUTTER: Applicant's Exhibits 3 through 8 will be admitted in evidence.

MR. KELLAHIN: That's all I have of Mr. Christy.

MR. NUTTER: Does anyone have any questions of Mr. Christy?

MR. CHRISTY: Incidentally, the ~~El Sudo~~ Osudo order is Number R-2821.

MR. NUTTER: Is that the ~~El Sudo~~ Osudo-Strawn?

MR. CHRISTY: That's the Wolfcamp--they have a similar one, I understand, for the Strawn also.

MR. NUTTER: Are there any further questions of Mr. Christy?

MR. CHRISTY: The order for the Strawn is Number R-2822.

MR. NUTTER: Just what are Amerada's plans at the present time for this location? Is that a firm location, as far as budget and so forth are concerned?

A Mr. Nutter, I believe the well is actually--has actually been authorized.

Q The FE has been put in and authorized?

A Yes. I also--to be frank, we are waiting until the order comes out before we start, but that doesn't mean we won't

drill if we get the forty-acre part.

Q What do you dedicate to that--the south half of the northwest of 31?

A Yes.

Q And presumably you would dedicate the north half of the northwest to Number 2?

A Yes.

Q In your opinion, is the north half of the northwest quarter of Section 31 productive of oil through that eighty-acre tract?

A I believe, from the structure on it as the geologist testified to, that the probabilities are very good that it could all be productive. I think--of course, one thing you have to take into consideration when you're talking about drainage is that that's not a square or rectangle. There may be some oil around these other tracts nobody is ever going to get if these wells are not drilled and produced, because they're not economical to drill, so that's the reason why you get better recovery from wells spaced on forty or eighty acres, because you're draining a lot more area than you give them credit for--they really have to, in order to get the oil they do.

Q Would you even consider drilling your well Number 3 in the northeast of the northwest, rather than the southwest

of the northwest?

A We think the present proposed location is a better gamble.

Q Much more attractive than the other forty?

A Yes.

Q The fact that the Continental GG 30 Number 1 and your Well Number 2 don't seem to build up to stabilized pressure within any kind of reasonable time doesn't particularly speak well for the drainage ability of the wells, does it?

A Well, it does for those two, I think, because they're fairly close together and it dropped rather rapidly. I think it indicates that there isn't very good communication between the Continental Number 2 and the other two wells, but I still think they are in the same reservoir.

Q And it also indicates that the Continental Number 1 and your Number 2 are both in a rather tight section?

A That's correct. This appears to be a fractured and tight ~~Metrex~~ matrix reservoir, and after you have built up your fractured production--after it builds up pressure, then you start getting oil coming out of the Metrex, which is very tight.

Q This is a fractured formation?

A Yes.

Q Are each of the three wells presently completed in

the pool capable of making top allowable under eighty-acre proration units?

A I think Continental's Number 2, the State GG 30 and Amerada State WME Number 2 are capable of making an eighty-acre allowable. I would imagine--I would hazard a guess that the Continental State GG 30 Number 1 at this time could not now. There would appear to be some possibility of them going in there and shutting off some of that water; in that case they might be able to make eighty.

Q Their ratio is better than two to one on water and oil?

A Yes, and it has always produced a considerable amount of water--it's rather odd.

Q It's the lowest well in the pool, structurally?

A That's right, but I believe our information will show that it was perforated pretty close to the water table, and they may have some additional productive capacity above the perforations that they could open up and shut off the water --I don't know.

Q The three wells in the pool at the present time have all paid out, as far as costs of drilling and completing them is concerned?

A Yes, sir.

Q So when you were referring to payout a while ago,

as far as payout is concerned the only one you would be concerned with would be this new location, the Number 3?

A Yes--any new wells would be involved in the payout.

MR. NUTTER: Are there any further questions of Mr. Christy?

MR. PORTER: Mr. Examiner, I don't have any questions but I have something I'd like to say, since this will be my last chance.

MR. CHRISTY: Is this off the record?

MR. PORTER: No, I think what I have to say should be part of the record. It came to my attention maybe a month ago that this would be Mr. Christy's last appearance here as an official representative of Amerada Petroleum Corporation, and certainly we're happy that Bob chose to come out and testify in this case himself, and give us an opportunity to visit with him again. Bob has actually been one of the most active of the industry people in New Mexico, and his career pretty closely parallels the significant producing history of New Mexiso, because he became acquainted with New Mexico during the old Hobbs pool days, and I believe he's been with the company for thirty-six years and that pool is about thirty-six years old. I remember a number of years ago at a hearing down here with the Texas Railroad Commission to consider establishing common allowables in the Bronco pools, and Jim

Thompson was presiding at that hearing, and he said he had seen Bob testify when he was a boy.

I haven't known Bob quite that long; our acquaintance goes back more than twenty years, and certainly during that twenty years Bob has rendered many services to this Oil Commission, for which we are certainly duly appreciative. We have thanked him at the time he performed these services; but I just want to say, Bob, that we certainly have appreciated all your contributions to conservation in this state. Bob has served on many industrial committees from 'way back in the Hobbs pool days, and perhaps most recent was the committee which considered revision of our forms. As a result of his working with other members of the committee and our staff, we made rather comprehensive changes in forms, and I believe we eliminated about three forms, and I think that's the most progress we ever made, Bob.

Certainly we hope you will get back to see us from time to time. We know you like Santa Fe and are sorry you couldn't get out here for your retirement--I mean come out here to live. I understand you're going to Texas. Certainly we have no argument with Texas; I know it will be good to do some fishing down there. Bob says he's never been proficient at fishing, but maybe he can concentrate more now.

Bob, it's been a pleasure to have associated with

you over all these years, and I know I speak for the Commission when I say we certainly appreciate it.

MR. CHRISTY: Thank you very much, Mr. Porter. There's not much more I can say--I think if I had my choice I would retire in New Mexico, and probably up here in Santa Fe, but for several reasons it won't work out that way.

I will say that in traveling around over the states Amerada operates in, and following proration matters and considering all the rules and regulations and laws, that I agree with your esteemed Governor when he made the talk the other day and said that New Mexico had the best set of rules and regulations and laws of any of the states producing oil; and certainly I agree with him. It's been a pleasure to come up here, and I know this is one state where you don't have to wait two or three years to get an order--and sometimes you don't even get an answer; we appreciate an answer, even if it's null, and some states don't even do that. I can certainly congratulate this state on their conservation, and I think it's doing a real fine job. With that, this case is closed.

MR. NUTTER: I want to say on behalf of myself and the staff of the Commission that we have enjoyed working with you over many long years, and we hope that, even though you don't come back as an official representative of Amerada, we will see you occasionally.

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MR. CHRISTY: You can be sure I'm going to try to get up here occasionally.

MR. NUTTER: Does anyone have anything they wish to offer? Mr. Christy may be excused. Does anyone have anything to offer in Case Number 3250? We will take the case under advisement.

* * *

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ELIZABETH K. HALE, Notary Public and Court Reporter, do hereby certify that the proceedings in the foregoing case were taken and transcribed by me, and that the foregoing is a true and correct transcript of proceedings to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF, my hand and seal of office this 5th day of June, 1965.

Elizabeth K. Hale
Notary Public

My commission expires

May 23, 1968.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3250, heard by me on 5/26, 1965.

....., Examiner
New Mexico Oil Conservation Commission