

CASE 5135: Appli. of ATLANTIC
FOR THE AMENDMENT OF ORDER NO.
R-4549, EDDY COUNTY, NEW MEXICO.

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CASE No.

5135

Application,

Transcripts,

Small Exhibits

ETC.

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
January 3, 1974

EXAMINER HEARING

IN THE MATTER OF:

Application of Atlantic
Richfield Company for the
amendment of Order No. R-4549,
Eddy County, New Mexico.

Case No. 5135

BEFORE: Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For New Mexico Oil Conservation
Commission:

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

For the Applicant:

Clarence Hinkle, Esq.
HINKLE, BONDURANT, COX &
EATON
Hinkle Building
Roswell, New Mexico

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I N D E X

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HUGH CHRISTIANSON

Direct Examination by Mr. Hinkle

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E X H I B I T S

Applicant's Exhibits 1 through 3

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Admitted
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MR. NUTTER: Call Case No. 5135.

MR. CARR: Case 5135. Application of Atlantic Richfield Company for the amendment of Order No. R-4549, Eddy County, New Mexico.

MR. HINKLE: Clarence Hinkle, Hinkle, Bondurant, Cox and Eaton, appearing on behalf of Atlantic Richfield. We have one witness and three Exhibits.

(Whereupon, Applicant's Exhibits
Nos. 1 through 3 were marked
for identification.)
(Witness sworn.)

HUGH CHRISTIANSON

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

DIRECT EXAMINATION

BY MR. HINKLE:

Q State your name, your residence and by whom you are employed?

A Hugh Christianson. I reside in Midland, Texas and employed by Atlantic Richfield Company.

Q What is your position with Atlantic Richfield?

A I'm a petroleum engineer, specifically the senior analytical engineer.

Q Have you previously testified before the Commission?

A Yes, sir.

Q Your qualifications are a matter of record with the Commission?

A That is correct.

MR. HINKLE: Qualifications acceptable?

MR. NUTTER: Yes, they are.

BY MR. HINKLE:

Q Are you familiar with the Application of Atlantic Richfield in this case?

A Yes, sir, I am.

Q What is Atlantic Richfield seeking to accomplish?

A We seek to increase the size of the unitized project area by approximately 200 acres and four additional wells and increase the allowable from the current 30,000 barrels per day to 33,000 barrels of oil per day.

Q Did you originally testify in the case wherein the Empire-Abo Unit was approved, a pressure maintenance project was approved?

A Yes, sir, I did.

Q Have you made a continuing study of the situation since that time?

A Yes, I have. It's my principle area of responsibility.

Q Have you prepared, or has there been prepared, under your direction and supervision certain Exhibits in this case?

A Yes, three Exhibits.

Q Three, 1, 2 and 3?

A That's correct.

Q Refer to Exhibit 1 and explain what this is, what it shows?

A Exhibit 1 is a map of the Empire-Abo Unit area showing the entire unit area, the tracts not participating as of the unit effective date of October 1st, 1973, and these are the red tracts as shown in your legend down in your lower-right-hand corner, non-participating tracts on the unit effective date. All red tracts then are those tracts which are outside the unit currently. The green colored tracts are those tracts which we seek to have the Commission approve to add to the project area at this Hearing.

Q Those tracts have been fully committed to the unit agreement?

A Yes, sir, they have.

Q They were tracts at the time of the original Hearing you anticipated would not be --

A (Interrupting) This is correct. We did not

anticipate that they would be in. They were not considered in the volitive allowable calculations which resulted in the 30,000 barrels rate recommendation. Would you like me to enumerate those tracts specifically?

Q Yes, you can.

A Tract No. 49. I think the easiest way to locate it is with this alphabetical-numerical grid which, Mr. Examiner, I think you are familiar with, probably. Alphabetical enumeration down the left margin and a numerical enumeration across the top of Tract No. 49 happens to be a unit designation at D-35. Right. This is the green tract No. 49, and further we find the Southwest quarter of the Southeast quarter of Section 27, Township 17 South, Range 28 East, contains 40 acres. Next, we have Tract 73-C which is -- occupies two 40-acre designations on the alphabetic designation, H-35 and H-36, Tract 73-C contains one producing well. It is an eighty-acre tract, located in the South half of the Southeast quarter of Section 34, Township 17 South, Range 28 East. We have Tract 77, Unit designation J-23, that contains one producing well and it is a 40.13-acre tract located in the Northwest quarter of the Northeast quarter, Lot 2 of Section 6, Township 18 South, Range 28 East and the final tract which we seek to add is located in unit designated

L-22, Tract No. 95-A, otherwise known as Southeast quarter of the Southwest quarter of Section 6, Township 18 South, Range 28 East and that tract contains one producing well and 40 acres even for a total added acreage of 200.13 acres and this results in our current unit acreage being 10,694.41 acres. This is within the project area, I might add, of the total unit area.

Q It's relative to your requesting that Order R-4549 which defines the original project area be ammended to include these tracts which you just testified to, embracing 200.13 additional acres?

A That is correct.

Q Now, refer to Exhibit No. 2 and explain what this shows.

A Exhibit 2 is a table which summarizes production and reservoir voidage performance of both before and after unit operations again on October 1st, 1973, projected unit performance under the proposed increased allowable is also illustrated. Performance data is presented for both unitized project area under Item "A" and the combined non-unit tracts under Item "B". I might start with Item "A", Unitized Project Area, particular time period. If you will refer to Line 1, Line 1 is before the unit. It is 1972 average. These values

on Line 1 are average values of gas-oil ratio, oil rates, water rates, reservoir voidage rates and reservoir voidage efficiency factor, columns 1 through 5 running from left to right and these are all values average for 1972 for the project area as it now stands, that is as of October 1st, 1973. Of course, it's still has that configuration. We see, for example, in Column 1, Line A-1, that the gas-oil ratio average for the entire unit project area in 1972 was 1,386 cubic feet per barrel of oil produced.

The oil rate in Column 2 is shown to be 24,111 barrels of oil per day and the water rate illustrated in Column 3 is 2,128 barrels of water per day. This resulting in reservoir voidage rate and reservoir volumetric barrels per day, Column 4, of 56,513 barrels of oil per day.

Column 5, again Line A-1 continuing, we find that reservoir voidage efficiency, which is in terms of reservoir volumetric barrels of voidage per stock tank barrel of oil produced. In effect, it is actually Column 4 divided by Column 2, on Line A-1. This voidage efficiency ratio, we find to be 3.24 during the year of 1972 on the average basis. I might point out that this voidage rate of 56,513 barrels was the voidage rate that we requested as a standard to be

judged against at the original Hearing of April 25th, 1973.

Now, moving on down to Line A-2, immediately before the unit, these values are average values for September of '73. The same variables we've just been talking about on Line A-1 for the 1972 errors. We find on that, for example, Line A-2, Column 1, Gas-Oil Ratio, that the average for September of '73 for the unitized project area, now, this is the month immediately before unitization. We're still operating under competitive completion conditions in September of '73. We find the gas-oil ration 1505 cubic feet per barrel.

MR. NUTTER: Let me interrupt here. Are you talking now about the units of project area as you submitted at the original Hearing, or are you talking about the project area as it would be expanded here?

THE WITNESS: This is the expanded project.

MR. NUTTER: This is the total of 10,644 acres that we've got in the unit now?

THE WITNESS: Right.

MR. NUTTER: Okay. Go ahead.

A Okay. So, we can see that gas-oil ratio had actually increased for this unitized project area from the average for '72 of 1,386 up here on Line A-1, Column 1, and

we see that gas-oil ratio by September of '73 for the project area had increased to 1505 cubic feet per barrel of oil.

Moving over to Column 2, the oil rate had actually declined somewhat to a value of 23,252 barrels of oil per day for the month of September '73, down from an oil rate of 24,111 for the 1972 average.

Moving over to Column 3, we see that the water rate had increased from the 1972 average of 2128 barrels of water per day to the September '73 average of 2518 barrels of water per day.

Moving over to Column 4, the reservoir voidage rate, essentially largely because of the increased gas-oil ratio shows lesser extent because of the increased water production. The reservoir voidage rate had increased to 71,802 barrels per day and we can see that -- moving it to Column 5 then, when you divide Column 4 by Column 2, you get the reservoir voidage efficiency ratio. That the reservoir efficiency had worsened, that is increase in these values over here in Column 5, means poorer efficiency because you are voiding more reservoir space to produce a barrel of stock tank oil, hence, pulling the pressure down somewhat more rapidly. So, at any rate, that reservoir voidage deficiency had increased

2.66 immediately before unitization compared to the average of 1972 of 2.34 barrels reservoir voided per barrel of stock tank oil produced. So, this then sets the conditions for the unitized project area immediately prior to unitization.

Then Line A-3, we find the unitized operation. Again, the same area, same project area, final analysis as of 10-1-73 and these are the values, average values, for October and November 1973, first two months that we have production data available. We do not yet have December's figures available to us. We see on Line A-3, Column 1, gas-oil ratio, has undergone a dramatic decline from a ratio of 1505 cubic feet per barrel, just prior to unitization down to 969 cubic feet per barrel. Of course, this is the result of shutting in the poor efficiency wells, high gas-oil ratio wells, a number of high water cut wells and shifting production to the efficient wells, low gas-oil wells to see this dramatic drop of more than a third in the gas-oil ratio, 1505 cubic feet per barrel to the 969 cubic feet per barrel. The oil rates are allowable, rendered to us by the Commission was 33,000 barrels per day. We actually averaged for October and November, as shown in Column 2, 33,189 barrels of oil per day.

Moving over to Column 3, you see that our water rate

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has declined approximately 1100 barrels per day from the 2,518 barrels of oil per day produced in September '73 down to 1419 barrels per day average for October and November of '73.

This results in a reservoir voidage rate then of 51,289 reservoir barrels per day and comparing this, of course, this is a drop of something like 10,600 barrels per day in reservoir voidage from the month of September '73, just prior to unitization. It's a drop of something over 5,000, around 5,200 barrels of reservoir space less being voided than our standard set in our first Hearing of 56,513, an average of 1972. This is, in spite of the fact, that we increased the oil production from 23,252 in September '73 to 30,189 average for October and November. So, we're voiding a lot less space to producing a lot more oil, which is exactly what the unit was designed to accomplish.

Moving over here then on Line A-3, Column 5, Reservoir voidage efficiency has undergone a dramatic drop in the direction of greater efficiency from 2.66 in September of '73 down to 1.70 reservoir volumetric barrels per stock tank barrel.

I might add at this point that referred to the fact that our 30,000 barrels a day allowable which we requested

at the first Hearing, April 25th, was as mentioned in our Application based on our estimates of what well would finally be in the unit and also an estimate of what we would be able to do in the way of gas-oil ratio and water production after unitization. Naturally, this was prior to April 25th of '73 and it was necessary to make these estimates. We estimated, for example, we estimated that we would be able to get gas-oil ratio down to about 1,050 cubic feet per barrel and we actually, as you can see, had it down to 969 in October and November.

We estimated that we would be able to get the water production down to 2,088 barrels of water per day, back in April of '73. We actually got it down to around 14 -- 19 barrels of water per day.

So, as a result of these estimates, our voidage calculations to stay within the voidage that we then were calculating for the area, the project area, we estimated that we would have resulted in an allowable of approximately 30,000 barrels and this was the basis. In other words, we were basing it on the average voidage for '72 of what we thought the project area was going to be and calculating what our voidage would be on the basis of estimated oil-gas ratios and water production, both of which we bettered in the actual

operations. So, therefore, our efficiency, as you see, has been considerably better than we expected and this really is the basis on which we're asking for the increased 33,000 and this demonstrated now in Line A-4. Line A-4 then is under unitized production and these are projected values on Line A-4, if the Commission sees fit to grant us this allowable 33,000 barrels a day which we're proposing. We estimate that our gas-oil ratio in January will be 974 cubic feet per barrel. Our oil rate, of course, will be 33,000, which we're asking for in Line A-4, Column 2.

Our water rate we expect to be about 1,550 barrels of water per day and this results in a reservoir voidage rate in Column 4, Line A-4 of 56,388 barrels per day. If you look back up to Line A-1, Column 4, this is our standard that we're working against, the average voidage for 1972 of 56,513 reservoir barrels per day. So, you can see we are running -- we expect to be slightly under that standard voidage at 33,000 barrels a day rate.

In moving on over on Line A-4 to the final Column 5, reservoir voidage deficiency. That will give us a voidage deficiency the same as we actually experienced in the first two months of production of 1.71 reservoir barrels per

stock tank barrel produced.

Moving on down here to Item "B" which covers the non-unit tracts and these comprise 13 wells on about 640 acres that are staying out and they are, of course, the red-colored tract on your Exhibit 1. We grouped all these wells together just to give you a feel for what the outside unit production is doing in terms of showing some of these same variables we just been looking at for the unitized project area and we see that Line B-1, September 1973, Column 1, gas-oil ratio in non-unitized area in September had gas-oil ratio of 2,151 compared to our unit ratio, as we discussed earlier of 969 cubic feet per barrel.

The oil rate from all non-unit wells was 1,482 barrels of oil per day in Column 2. They're not making very much water, six barrels per water per day, Column 3.

The reservoir voidage rate, 5,423 reservoir barrels per day and then when you jump over to Column 5, you get to our voidage ratio, dividing that 5,423 voidage by that 1,482 stock tank barrels produced per day. You see that their average reservoir efficiency is up to 3.66 reservoir barrels per stock tank barrel and then dropping down to October, Line B-2, the same group of wells, you see that they've undergone a slight increase in gas-oil ratio from 2151 to 2295 cubic

feet per barrel. The oil rate has dropped somewhat to 1482 to 1378, a slight change of four barrels of water per day. The overall voidage rate, 5,372 barrels reservoir space per day, but with the slight drop in oil rate we find the reservoir voidage efficiency is slightly poorer than it was in September. In October it is now 3.90 voidage per barrel of stock tank barrel, up from 3.66 in September of '73.

Q Refer now to Exhibit 3 and explain that.

A Exhibit 3 is a Table summarizing the unitized project area well status and the average per well oil producing rate, both under the current allowable 30,000 barrels a day and what we would expect to experience under the new proposed new allowable of 33,000 barrels a day. Over here in the first column on the left, we find that the well status under Category "A", November, 1973, on the line "Shut-in Wells", we find that 80 wells were shut-in. These were wells producing prior to the time the unit was formed, which we're just using November as an example. This is -- it was the same in October, essentially. It may have been two wells difference, but at any rate, November shows 80 wells shut in and, of course, their average rate was zero. Producing wells are 142. So, we had 142 wells producing and those wells, in order to achieve the Commission granted

allowable of 30,000 barrels a day shown over here in the last column on the right averaged 211 barrels of oil per day per well. Down here in the last line and under Item "A", Project Area Total, we find that there are 222 wells capable of producing in the unitized project area and when you divide that 30,000 barrels allowable by those 222 wells, you find that averages out to 135 barrels allowable per well capable of producing.

Then, moving down to see what we would have under -- in January under our projected 33,000 allowable that we're requesting here, we find that we would still have the same 80 wells shut-in in January of '74, same 142 wells producing and the same project total of 222. The average, in order to get the 33,000 average per well producing will have increased from 211 barrels a day to 232 barrels per day or about 21 barrels per day per producing well increase. Project area total of 222 wells, you divide that 33,000 allowable by those 222 wells capable of producing, you get this figure of 149, which might be called an average of allowable per well capable of producing 149 barrels of oil per day. That's an increase of about 14 barrels a day from the figure of 135 shown up here on Category "A".

Q Who is purchasing or running the oil from the Empire-

Abo?

A At the present time ARCO Pipeline.

Q Does ARCO have the facilities available to handle increased production if the Commission sees fit to approve the increased allowable?

A Yes, they do.

Q Is your gathering system sufficient at the present time to handle the additional 3,000 barrels?

A Yes, it is.

Q When would you like to make this increased allowable effective if it is approved by the Commission?

A We would like to ask that it be made effective January 1st, 1974, if the Commission so pleases.

Q Now, in your original testimony before the Commission, in connection with the pressure maintenance project, you estimated that it would be an increased recovery of some three million barrels of oil. In your opinion, will this increase of allowable have any effect upon the total recovery?

A In my opinion, any effect to this increase in ultimate recovery or increased recovery due to pressure maintenance would be so small of such a marginal nature that it would be far less than the normal range of accuracy you'd expect in any type of reservoir engineering calculation giving the

increased reserves that we have cited here.

Q Under the original Order approving the pressure maintenance project, gas was to be started by a certain date or you estimated it would be started by a certain date?

A Yes.

Q Are you on schedule with your original necessary facilities and so forth?

A We are on schedule. We feel like we're a little ahead of schedule, but the project engineers themselves are still saying March 18th, 1974, will be the day we'll start injecting gas, so --

Q (Interrupting) And then under the present Orders the allowable will automatically be increased at that time, is that right?

A This is -- yes, this is tied somewhat to the volume of produced gas injected. However, we will earn an allowable increase. We already have been granted in the original Order an allowable of 40,192 after we start gas injection.

Q So, what you're really asking is that you be permitted to produce an additional 3,000 barrels per day until such time as you start your gas injection and come under the provisions of the existing Order, is that right?

A Which is -- right -- which we foresee now should be

March 18th, 1974.

Q Now, in your opinion, will the increased allowable be, in the interest of the provision of project area, in the interest of conservation and prevention of waste and intend to protect correlative rights?

A Yes, it will.

Q Will the increased allowable also be in the interest of helping alleviate the present energy shortage?

A Yes, I think it goes without saying that it certainly will.

Q We would like to introduce in evidence Exhibits 1 through 3.

MR. NUTTER: Applicant's Exhibits 1 through 3 will be admitted in evidence.

MR. HINKLE: That's all I have.

(Whereupon, Applicant's Exhibits
Nos. 1 through 3 for identification were admitted in evidence.)

MR. NUTTER: Mr. Christianson, just to set the record straight, I'd like to make a couple of corrections that I think you erred in your testimony. In referring to Tract No. 77 on Exhibit 1, I believe you called that to be in grid J-23. That would be I-23?

THE WITNESS: Yes, I was on the wrong line.

MR. NUTTER: And also when you were referring to the non-unit tracts on Exhibit No. 2 having a ratio of 2151 during the month of September --

THE WITNESS: (Interrupting) That's right.

MR. NUTTER: (Continuing) -- you compared that to the unitized area of 969. However, the 2151 would be compared to 1505, I believe.

THE WITNESS: Yes, I'm sorry.

MR. NUTTER: For September.

THE WITNESS: That's a bad comparison. Actually, October would be -- looks even worse, really, for the non-unit area. The gas-oil ratio went up. In October, of course, our project area went way down to 969 approximately.

MR. NUTTER: Now, I'm still confused. When you were first talking about the average reservoir voidage during 1972 at the Hearing last April, you were talking about 56,513 barrels in the area that you anticipated would be in the unit; is that correct?

THE WITNESS: Well, no. Last April, I think, the value would have been something different than that. We didn't --

MR. NUTTER: (Interrupting) So, this 56,000 is not

the figure you gave in April then?

THE WITNESS: No, we didn't actually -- I didn't testify to any figure as such in April. The only thing I testified to was the 30,000. The 30,000 was based on a lower voidage value than 56,513, which I didn't discuss in my testimony there.

MR. NUTTER: You had a 1972 reservoir voidage in April, didn't you?

THE WITNESS: Well, I don't find it in the record of testimony. Now, what -- let me clarify this as to what this is, this 56,513 is the voidage for 1972 for all of these -- for the entire unitized project area, which means it leaves out the red tracts only.

MR. NUTTER: It does include the green tract?

THE WITNESS: The green tract.

MR. NUTTER: Okay. That's what I wanted to be clear. It does include the green tract?

THE WITNESS: Yes, and our 30,000 allowable that we asked for at April 25th was not based -- we assumed the green tract was not going to come in.

MR. NUTTER: All right.

THE WITNESS: So, we actually then had a lower voidage value, which in effect gave us a lower allowable also.

MR. NUTTER: But Line 1, Column 4, does represent the unitized area as expanded here today?

THE WITNESS: Right. We figure we are working against or as defined as the average voidage for 1972 of the unitized project here as it stands as of October 1, 1973, effective date of unit.

MR. NUTTER: Now, Mr. Christianson, the Order that authorized the pressure maintenance has a formula in it whereby the amount of injected gas that's plugged into the formula and the allowable for the project increased, and I think the total maximum increase is something like 10,192 barrels or something like that.

THE WITNESS: That's right.

MR. NUTTER: Okay. Now is it your interpretation that this would be on top of 33,000 or would this be on top of 30,000?

THE WITNESS: Actually, the 30,192 is what we would work against, so, we're asking for an extra 3,000, which in effect, we look at it as subtracting from that extra 10,192.

MR. NUTTER: So, in other words, that means when full gas injection is accomplished under the existing formula, you get a bonus, so to speak, for gas injection of about 7,000?

THE WITNESS: That's right.

MR. NUTTER: Because you're taking 3,000 now under your proposal?

THE WITNESS: Yes, that's right.

MR. NUTTER: Okay. I wanted to be sure of the interpretations there.

THE WITNESS: Yes.

MR. NUTTER: Are there any further questions of the witness? You may be excused.

(Witness excused.)

MR. NUTTER: Do you have anything further, Mr. Hinkle?

MR. HINKLE: That is all.

MR. NUTTER: Does anyone have anything further they wish to offer in Case 5135?

Mr. Currens?

MR. CURRENS: Daniel Currens, Amco Production Company. Amco supports Atlantic in their request for revision of the Order governing the Empire-Abo pressure maintenance project and urge approval of their Application here today.

MR. NUTTER: Does Amco have any wells in this unit, Mr. Currens?

MR. CURRENS: Yes, sir, significantly.

MR. CARR: Mr. Examiner, we've received a letter from Exxon Company in support of the Application.

MR. NUTTER: Thank you.

MR. HINKLE: Mr. Examiner, I have here a letter from Exxon addressed to the Commission. This is to advise that Exxon Company supports Atlantic Richfield Application for an allowable increase.

MR. NUTTER: That's a copy of this same letter.

Is there anything further in Case 5135? If not, we'll take the case under advisement.

STATE OF NEW MEXICO)
)ss
COUNTY OF SANTA FE)

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


RICHARD L. NYE, Court Reporter

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 5135, heard by me on 1-3, 1974.


Examiner
New Mexico Oil Conservation Commission

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OIL CONSERVATION COMMISSION

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

87501

I. R. TRUJILLO
CHAIRMAN
LAND COMMISSIONER
ALEX J. ARMIJO
MEMBER
STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

January 15, 1973

Mr. Clarence Hinkle
Hinkle, Bondurant, Cox & Eaton
Attorneys at Law
Post Office Box 10
Roswell, New Mexico 88201

Re: CASE NO. 5135
ORDER NO. R-4549-A
Applicant:
Atlantic Richfield 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.

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

Copy of order also sent to:

Hobbs OCC x
Artesia OCC x
Aztec OCC

Other State Engineer Office

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. 5135
Order No. R-4549-A

APPLICATION OF ATLANTIC RICHFIELD
COMPANY FOR AMENDMENT OF ORDER
NO. R-4945, EDDY COUNTY, NEW
MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on January 3, 1974,
at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 15th day of January, 1974, 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 by Order No. R-4548, dated June 15, 1973, the
Commission granted approval of the Empire-Abo Unit Agreement.

(3) That by Order No. R-4549, dated June 15, 1973, the
applicant, Atlantic Richfield Company, was authorized to institute
a pressure maintenance project in the Empire-Abo Pool in its
Empire-Abo Unit Area, Eddy County, New Mexico, designated the
ARCO Empire-Abo Unit Pressure Maintenance Project.

(4) That Order No. R-4549 further promulgated Special Rules
and Regulations for the Empire-Abo Pressure Maintenance Project.

(5) That Finding (7) of Order No. R-4549 limits production
from the project area as described in Finding (4) of said order
to the average reservoir voidage for the calendar year 1972 or
30,000 barrels of oil per day, whichever is less, during the
period prior to the start of gas injection.

(6) That the allowable figure of 30,000 barrels of oil per
day was based on assumptions as to the future size of the
unitized project area and the estimated gas and water production
expected after unitization.

Case No. 5135
Order No. R-4549-A

(7) That since the formation of the Empire-Abo Unit Pressure Maintenance Project the following additional tracts, comprising 200.13 acres of land, within the Empire-Abo Unit Area have been committed to the unit:

EDDY COUNTY, NEW MEXICO
TOWNSHIP 17 SOUTH, RANGE 28 EAST, NMPM
Section 27: SW/4 SE/4
Section 34: S/2 SE/4

TOWNSHIP 18 SOUTH, RANGE 28 EAST, NMPM
Section 6: NW/4 NE/4 (Lot 2) and
SE/4 SW/4

(8) That these additional tracts were not considered in arriving at the 30,000 barrels of oil per day project allowable provided for in Order No. R-4549.

(9) That the actual production of gas and water has been less than was anticipated under unitized operations.

(10) That due to more unit area wells and greater efficiency than was expected, an increased allowable can be produced while continuing to limit reservoir voidage to the average voidage set for calendar year 1972 in Order No. R-4945.

(11) That the project allowable should be increased to 33,000 barrels of oil per day effective retroactively to January 1, 1974.

(12) That increasing the project allowable to 33,000 barrels of oil per day is in the interest of conservation, prevention of waste and protection of correlative rights.

IT IS THEREFORE ORDERED:

(1) That Order No. R-4945 is hereby amended to include within the Empire-Abo Unit Pressure Maintenance Project the following tracts which comprise 200.13 acres:

EDDY COUNTY, NEW MEXICO
TOWNSHIP 17 SOUTH, RANGE 28 EAST, NMPM
Section 27: SW/4 SE/4
Section 34: S/2 SE/4

TOWNSHIP 18 SOUTH, RANGE 28 EAST, NMPM
Section 6: NW/4 NE/4 (Lot 2) and
SE/4 SW/4

(2) That the project allowable is increased to 33,000 barrels of oil per day effective retroactively to January 1, 1974.

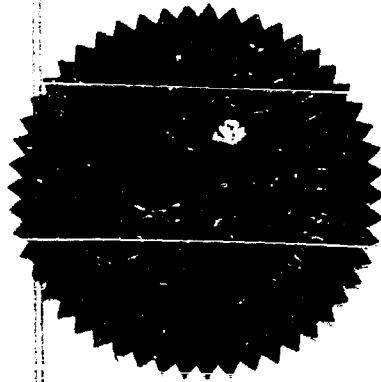
-3-

Case No. 5135

Order No. R-4549-A

(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

I. R. Trujillo
I. R. TRUJILLO, Chairman

Alex J. Armijo
ALEX J. ARMILLO, Member

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

S E A L

dr/

EXXON COMPANY, U.S.A.
POST OFFICE BOX 1600 • MIDLAND, TEXAS 79701

Jan 5/35

December 21, 1973

PRODUCTION DEPARTMENT
MIDCONTINENT DIVISION
L. H. BYRD
MANAGER

Re: Empire Abo Unit
Eddy County, New Mexico
File: 22-3

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

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

Gentlemen:

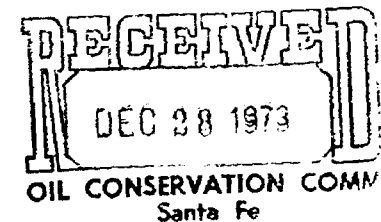
Atlantic Richfield Company, as Unit Operator, has scheduled for January 3, 1974, a hearing to request an allowable increase for the Empire Abo Unit, Eddy County, New Mexico. Please be advised that Exxon Company, U.S.A. supports Atlantic Richfield Company's application for the allowable increase.

Very truly yours,

L. H. Byrd
L. H. Byrd

WEN/bh

cc: Atlantic Richfield Company
P. O. Box 1610
Midland, Texas 79701



Memo

From
D. S. NUTTER
CHIEF ENGINEER

To
Barrels per day rather than
30,000 as presently provided,

Memo

From
D. S. NUTTER
CHIEF ENGINEER

To
the SW/4 SE/4 of Sec 27 and
the S/2 SE/4 of Sec 34, both
in Township 17 South,
Range 28 East, and the
NW/4 NE/4 and the SE/4
SW/4 of Sec 6, Township
18 South Range 28 East,
Empire Oil Pool, Eddy
County, New Mexico.
Applicant further seeks
the amendment of Rules 3 and
4 of said special rules to
provide that, ^{effective January 1, 1974,} the maximum allowable
for the project area be 33,000

EMPIRE ABO POOL - Production and Reservoir Voidage Performance
(Unit Effect Date, October 1, 1973. Data prepared December, 1973.)

| (1) | (2) | (3) | (4) | (5) |
|---|--------------------|----------------------|------------------------------------|--|
| Gas/Oil Ratio (ft ³ /BO) | Oil Rate (BOPD) | Water Rate (BWPD) | Reservoir Voidage Rate RVB/D | Reservoir Voidage Efficiency, RVB/STB (4)/(2) |

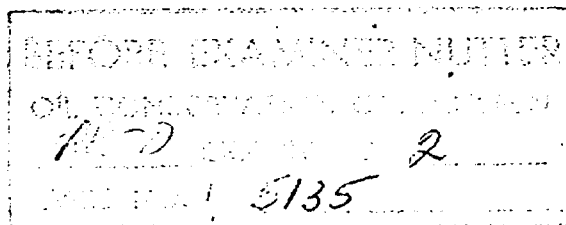
Empire Abo Pool:

A. Unitized Project Area,
Time Period

| | | | | | |
|---|-------|--------|-------|--------|------|
| 1. Before Unit - 1972 Avg. | 1,386 | 24,111 | 2,128 | 56,513 | 2.34 |
| 2. Before Unit - Sept, '73. | 1,505 | 23,252 | 2,518 | 61,802 | 2.66 |
| 3. Unitized - Oct-Nov, '73. | 969 | 30,189 | 1,419 | 51,289 | 1.70 |
| 4. Unitized - Jan, '74. (Proposed allowable) | 974 | 33,000 | 1,550 | 56,388 | 1.71 |

B. Non-Unit Tracts,
Time Period

| | | | | | |
|--------------------|-------|-------|---|-------|------|
| 1. September, 1973 | 2,151 | 1,482 | 6 | 5,423 | 3.66 |
| 2. October, 1973 | 2,295 | 1,378 | 4 | 5,372 | 3.90 |



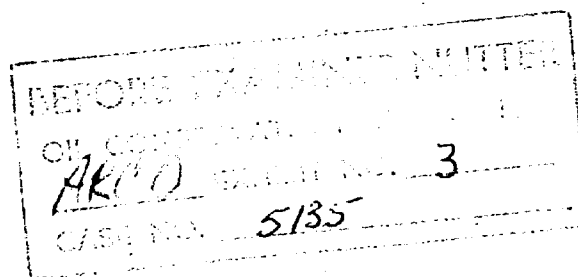
EMPIRE ABO POOL

Unitized Project Area

Well Status and Average Oil Producing Rate,
Actual for November 1973 (Allowable 30,000 BOPD);
Proposed for January 1974 (Allowable 33,000 BOPD).

| <u>Well Status</u> | <u>Number of Wells</u> | <u>Average Rate BOPD/Well</u> | <u>Project Area Allowable (BOPD)</u> |
|--------------------------------|----------------------------|-----------------------------------|--|
| A. <u>November 1973</u> | | | |
| Shut In | 80 | 0 | |
| Producing | 142 | 211 | |
| Project Area Total: | 222 | 135 | 30,000 |
| B. <u>January 1974</u> | | | |
| Shut In | 80 | 0 | |
| Producing | 142 | 232 | |
| Project Area Total: | 222 | 149 | 33,000 |

*21 BOPD,
5 producing
wells*



CLARENCE E. HINKLE
W. E. BONDURANT, JR.
LEWIS C. COX, JR.
PAUL W. EATON, JR.
CONRAD E. COFFIELD
HAROLD L. HENSLEY, JR.
STUART D. SHANOR
C. D. MARTIN
PAUL J. KELLY, JR.
~~ANDREW ALLEN~~

LAW OFFICES
HINKLE, BONDURANT, COX & EATON

600 HINKLE BUILDING
POST OFFICE BOX 10
ROSWELL, NEW MEXICO 88201

December 10, 1973

TELEPHONE (505) 822-6510

MIDLAND, TEXAS OFFICE
521 MIDLAND TOWER
(915) 683-4691

Oil Conservation Commission
Box 2088
Santa Fe, New Mexico 87501

Attention: Mr. Dan Nutter

Gentlemen:

We enclose in triplicate application of Atlantic Richfield Company for an increased project allowable for the Empire Abo Unit Area. I have previously discussed this matter with Dan Nutter and it is my understanding that this case will appear on the docket for January 3, 1974.

Yours very truly,

HINKLE, BONDURANT, COX & EATON

By Clarence E. Hinkle
CH

CEH:cs

Enc.

cc: Horace N. Burton
D. W. Holt
J. R. Rhotenberry
Hugh Christianson

DOCKET MAILED

12-18-73

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

APPLICATION OF ATLANTIC RICHFIELD
COMPANY FOR AN INCREASED PROJECT
ALLOWABLE FOR THE EMPIRE ABO PRESSURE
MAINTENANCE PROJECT AS APPROVED BY
ORDER R-4549 AND FOR REVISION OF THE
PROJECT AREA TO INCLUDE 200.13 ADDI-
TIONAL ACRES IN TOWNSHIPS 17 AND 18
SOUTH, RANGE 28 EAST. APPLICANT SEEKS
TO INCREASE THE PROJECT ALLOWABLE FROM
30,000 BARRELS OF OIL PER DAY TO 33,000
BARRELS PER DAY AND TO MAKE THE SAME
RETROACTIVE TO JANUARY 1, 1974.

Oil Conservation Commission
Box 2088
Santa Fe, New Mexico 87501

Comes Atlantic Richfield Company, acting by and through the undersigned attorneys, and hereby makes application for an increased project allowable for the Empire Abo Pressure Maintenance Project as approved by Order R-4549 and for the revision of the project area to include 200.13 additional acres in Townships 17 and 18 South, Range 28 East. Applicant seeks to increase the project allowable from 30,000 barrels of oil per day to 33,000 barrels per day and to make the same retroactive to January 1, 1974, and in support thereof respectfully shows:

1. There is filed herewith as Exhibit "A" a plat showing the boundaries of the originally proposed unit area and showing those tracts within and without the present unitized project area.

2. The Oil Conservation Commission of the State of New Mexico granted approval of the Empire Abo Unit Agreement by Order R-4548 dated June 15, 1973 and granted approval of the ARCO Empire Abo Unit Pressure Maintenance Project by Order R-4549, also date June 15, 1973.

3. That Finding 7 of Order R-4549 limits production from the project area as described in Finding 4 of the same Order to the average reservoir voidage for the calendar year 1972 or 30,000 barrels of oil per day, whichever is less, during the period prior to start of gas injection.

4. The allowable figure of 30,000 barrels of oil per day testified to at the hearing on April 25, 1973 was based on certain

assumptions as to future size of the unitized project area and as to the estimated gas and water production to be expected after unitization.

5. The following described tracts within the Empire Abo Unit Area have been committed to the unit agreement and at the time of the formation of the unit it was not anticipated that these tracts would be committed and they were not considered in arriving at the 30,000 barrels of oil per day for the project allowable provided for in Order R-4549:

| Tract Number | Unit Designation | Location | Tract Acreage |
|-----------------|---------------------|--|------------------|
| 49 | D35 | SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 27, Township 17 South, Range 28 East | 40.00 |
| 73C | H35, H36 | S $\frac{1}{2}$ SE $\frac{1}{4}$ Section 34, Township 17 South, Range 28 East | 80.00 |
| 77 | I23 | NW $\frac{1}{4}$ NE $\frac{1}{4}$ (Lot 2) Section 6, Township 18 South, Range 28 East | 40.13 |
| 95A | L22 | SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 6, Township 18 South, Range 28 East | 40.00 |
| | | | <hr/> 200.13 |

6. The actual production of gas and water has been less than was anticipated under unitized operations and because there are more unit area wells than expected and due to the fact that the unit wells are performing more efficiently than was anticipated, an increased allowable can be produced while continuing to limit reservoir voidage to the average voidage for the calendar year 1972.

7. Applicant requests an increase above the project allowable of 30,000 barrels per day previously granted for the period before gas injection to 33,000 barrels and that such allowable be made retroactive to January 1, 1974.

8. In the opinion of applicant, said pressure maintenance project, and allowable increase will be in the interest of conservation, prevention of waste, the protection of correlative rights and will tend to promote the greatest ultimate recovery of oil and gas from that portion of the Empire Abo Pool covered by the project.

9. Applicant requests that this matter be set for hearing at the examiner's hearing to be held on January 3, 1973.

Respectfully submitted,

ATLANTIC RICHFIELD COMPANY

By


HINKLE, BONDURANT, COX & EATON
Attorneys for Applicant

DRAFT

dr/

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 5135

Order No. R-4549-A

APPLICATION OF ATLANTIC RICHFIELD
COMPANY FOR AMENDMENT OF ORDER
NO. R-4945, EDDY COUNTY, NEW
MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on January 3, 1974,
at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this day of January, 1974, 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 by Order No. R-4548, dated June 15, 1973, the
Commission granted approval of the Empire-Abo Unit Agreement.

(3) That by Order No. R-4549, dated June 15, 1973, the applicant, Atlantic Richfield Company, was authorized to institute a pressure maintenance project in the Empire-Abo Pool in its Empire-Abo Unit Area, Eddy County, New Mexico, designated the ARCO Empire-Abo Unit Pressure Maintenance Project.

(4) That Order No. R-4549 further promulgated Special Rules and Regulations for the Empire-Abo Pressure Maintenance Project.

(5) That Finding (7) of Order No. R-4549 limits production from the project area as described in Finding (4) of said order to the average reservoir voidage for the calendar year 1972 or 30,000 barrels of oil per day, whichever is less, during the period prior to the start of gas injection.

(6) That the allowable figure of 30,000 barrels of oil per day was based on assumptions as to the future size of the unitized project area and the estimated gas and water production expected after unitization.

(7) That since the formation of the Empire-Abo Unit Pressure Maintenance Project the following additional tracts, comprising 200.13 acres of land, within the Empire-Abo Unit Area have been committed to the unit:

EDDY COUNTY, NEW MEXICO
TOWNSHIP 17 SOUTH, RANGE 28 EAST, NMPM
Section 27: SW/4 SE/4
Section 34: S/2 SE/4

TOWNSHIP 18 SOUTH, RANGE 28 EAST, NMPM
Section 6: NW/4 NE/4 (Lot 2) and
SE/4 SW/4

(8) That these additional tracts were not considered in arriving at the 30,000 barrels of oil per day project allowable provided for in Order No. R-4549.

(9) That the actual production of gas and water has been less than was anticipated under unitized operations.

(10) That due to more unit area wells and greater efficiency than was expected, an increased allowable can be produced while continuing to limit reservoir voidage to the average voidage set for calendar year 1972 in Order No. R-4945.

(11) That the project allowable should be increased to 33,000 barrels of oil per day effective retroactively to January 1, 1974.

(12) That increasing the project allowable to 33,000 barrels of oil per day is in the interest of conservation, prevention of waste and protection of correlative rights.

IT IS THEREFORE ORDERED:

(1) That Order No. R-4945 is hereby amended to include within the Empire-Abo Unit Pressure Maintenance Project the following tracts which comprise 200.13 acres:

EDDY COUNTY, NEW MEXICO
TOWNSHIP 17 SOUTH, RANGE 28 EAST, NMPM
Section 27: SW/4 SE/4
Section 34: S/2 SE/4

TOWNSHIP 18 SOUTH, RANGE 28 EAST, NMPM
Section 6: NW/4, NE/4 (Lot 2) and
SE/4, SW/4

(2) That the project allowable is increased to 33,000 barrels of oil per day effective retroactively to January 1, 1974.

(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.

DRAFT

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. 5135

Order No. R-4549-A

*Application of Atlantic Richfield
Company for Amendment of
Order No. 1945, Eddy County,
New Mexico.*

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on January 3, 1974,
at Santa Fe, New Mexico, before Examiner Daniel S. Norton.

NOW, on this 3 day of January, 1974, 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.

(8) That the additional tracts were not considered in arriving at the 30,000 ~~±~~ barrels of oil per day project allowable provided for in Order No. Z-4549.

(9) That the actual production of gas and water has been less than was anticipated under unitized operations. ^{(10) That} due to more ^{unit area} wells ~~than expected~~ and greater efficiency than ^{was} expected, an increased allowable can be produced while continuing to limit reservoir voidage to the average voidage set for calendar year 1972 in Order Z-1945.

(10) That the project allowable should be increased to 33,000 barrels of oil per day effective ~~on~~ ^{from} January 1, 1974.

(11) That increasing the project allowable to 33,000 barrels of oil per day is in the interest of conservation, prevention of waste and protection of correlative rights.

IT IS THEREFORE ORDERED:

(1) That Order No. Z-4945 is hereby amended to include ~~the~~ ^{the} within the Empire also ~~the~~ Unit Pressure Maintenance Project the following tracts which comprise 200.13 acres:
(see Exhibit 7)

(2) That the program ...
increased to \$33,000 ...
per day effective retroactively to
January 1, 1974.

(3) That jurisdiction ...

DONE at Santa Fe,

Clarence Hinkel
Memo

From
D. S. NUTTER
CHIEF ENGINEER

To
All auto Right of Way
Increased Project Allocation
30000 to 33000 PDDP
for Empire also Unit
Project Area
retroactive to Jan 1, 1974.

Memo

From
D. S. NUTTER
CHIEF ENGINEER

To
Application of Atlantic Richfield
Company for the Amendment
of Order No. R-4549, Edley
County, New Mexico.

Applicant, in the above styled
Cause, seeks the amendment
of Rule 1 of the Special Rules
for the Empire - also
Pressure Maintenance Project
to expand as promulgated
by Order No. R-4549 to
expand the project area as