

CASE 5505: ATLANTIC RICHFIELD COMPANY
FOR PRESSURE MAINTENANCE PROJECT EXPAN-
SION, EDDY COUNTY, NEW MEXICO

CASE NO.

5505

APPLICATION,
TRANSCRIPTS,
SMALL EXHIBITS,

ETC.

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
June 10, 1975

EXAMINER HEARING

IN THE MATTER OF:

Application of the Atlantic
Richfield Company for pressure
maintenance project expansion,
Eddy County, New Mexico.

CASE NO. 5505

BEFORE: Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the New Mexico Oil
Conservation Commission:

William F. Carr, Esq.
Legal Counsel for the
Commission
State Land Office Building
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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S. HUGH CHRISTIANSON

Direct Examination by Mr. Hinkle
Cross Examination by Mr. Nutter

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E X H I B I T S

Applicant's Exhibits Nos. 1 through 6

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CHRISTIANSON-DIRECT

MR. NUTTER: Case 5505.

MR. CARR: Case 5505. Application of the Atlantic Richfield Company for pressure maintenance project expansion, Eddy County, New Mexico.

MR. HINKLE: Clarence Hinkle of Hinkle, Bondurant, Cox and Eaton. We have one witness that we would like to have sworn.

(Witness sworn)

S. 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, residence and by whom you are employed?

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

Q What is your position with the Company?

A I am an area engineer in Midland.

Q You have previously testified before the Commission a number of times and qualified as a petroleum engineer?

A Yes, sir, I have.

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Q And you have been a witness in several cases that have involved the Empire-Abo Unit, have you not?

A Yes, sir.

Q In pressure maintenance?

A Yes, sir.

Q Have you prepared or has there been prepared under your direction certain exhibits in this case?

A Yes, sir, there have been.

Q Do you have the ones that have been marked 1 through 6?

A That is correct.

MR. NUTTER: For the record, Mr. Hinkle, let me interrupt for one second. When we prepared the legal notice for this, we actually made a slight error here. We said, "Applicant further seeks an increase in the base allowable project from 40,555 to 41,041 barrels per day. This is not the base allowable. This is the maximum allowable. I think the base allowable is something like 33,000 barrels.

THE WITNESS: Yes, that's right, and as you will find when we get into testimony, we are going to ask for the base also, a slight increase there, simply based on the increased project area.

CHRISTIANSON-DIRECT

CASE 5505

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MR. NUTTER: But the notice here saying the base allowable would be 41,000 is in error?

THE WITNESS: That is correct. I don't believe we had that in our Application.

MR. NUTTER: Go ahead, Mr. Hinkle.

BY MR. HINKLE:

Q Since you last appeared in connection with the pressure maintenance project, have you continued to make a study of the project?

A Yes, sir, I have.

MR. HINKLE: Are his qualifications sufficient?

MR. NUTTER: Yes, they are.

BY MR. HINKLE:

Q Explain briefly what Atlantic Richfield is seeking in this case?

A Atlantic Richfield seeks to increase the size of the unit project area by 120.03 acres which would result in a new area size of 10,814.44 acres in the unitized project area. We also seek an increase in the maximum project allowable from the 40,555 barrels of oil per day granted in Order R-4549-B to 41,041 barrels of oil per day, or an increase of 486 barrels of oil per day.

Q Have you continued to make studies of the areas

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since the last hearing?

A Yes, I sure have.

Q Have you completed those studies, and what are the results?

A Well, they continue to show that the unitized area is performing very much as our predictions made in earlier testimony or testified to in earlier hearings, I should say.

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

A Exhibit 1 is a map of the entire Empire-Abo Unit area. It is a similar map to the one the Commission has seen before. The heavy dashed blue lines is the outline of the entire area approved for potential unitization by the U.S.G.S., the State Land Commission and the N.M.O.C.C. at the original hearing. The white tracts or uncolored tracts if you want to call them that are those tracts which are in the present unitized project area of the Arco-Empire-Abo Unit at this time.

Q They are committed to the unit?

A They are committed to the Arco-Empire-Abo Unit at this time. Those red tracts in the northwest portion of the area, that is, Tracts Nos. 2, 6, 42 and 46 comprise

CHRISTIANSON-DIRECT

Sitco-Empire-Abo Unit area which has been unitized and plans are underway at this time, as I understand, to inject gas into a gas injection well that has been recently completed there. The other red colored tracts are those tracts which continue to remain outside the -- any unit area at this time. The three green colored tracts are the tracts that are the subject of this hearing today. On these three tracts Arco has submitted to the remainder of the unit owners in the unit, the request made by the operators of these green tracts that they be admitted to Arco-Empire-Abo Unit.

I might identify these tracts a little bit more carefully. That is, Tract 41 on Exhibit 1 is your unit designation I-32, and it comprises 40.03 acres. It is Lot 1 of the northeast quarter northeast quarter Section 4, Township 18 South, Range 28 East. Tract 79 is unit designated D-34, and it is the southeast quarter of the southwest quarter of Section 27, Township 17 South, Range 28 East and it comprises 40.00 acres. Tract 84 is unit designation U-26, and it is the southeast quarter of the northwest quarter, Section 5, Township 18 South, Range 28 East, and it contains 40.00 acres for the total added acreage of 120.03 acres that we are proposing to be included

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in the new expanded area.

I might add that the State owns the full royalty on all three of these State tracts. They are all three State tracts.

Q Now refer to Exhibit 2 and explain what this is and what it shows?

A Exhibit 2 is a table which illustrates the Empire-Abo Pool total-daily-oil-production rate with Tracts 41, 79 and 84 which are the green tracts in Exhibit 1, taken into the unitized project area, and with several representative actual producing rates postulated for the Sitgo Unit and for the remainder of the non-unit wells within the Empire-Abo Pool. I might just run down Column 1 as an explanation: Column 1, for example, Line A, the daily oil rate for the Arco-Empire-Abo Unit including these three new tracts that we are asking today, 41,041 barrels of oil per day. If we assume the Sitgo-Empire-Abo Unit as producing as the asterisk indicates at its average oil rate for the seven-month period, the Sitgo Unit itself went to maximum allowable, and that seven-month period is from September, 1974 through March, 1975, that rate is 350 barrels a day for the Sitgo-Empire-Abo Unit. The average rate for that same seven-month period in Line C for all

CHRISTIANSON-DIRECT

non-unit Empire-Abo pool production is 477 barrels per day. We add those numbers in A, B and C, and we get total production for the Empire-Abo Pool at 41,868 barrels per day. The same operation performed in Columns 2 and 3 for two other types of assumptions, which I think are pretty obvious, so I won't go into them unless you want to question me on them later.

Q Refer to Exhibit 3 and explain that?

A Exhibit 3 is a brief exhibit which simply shows the effective benefits to the reservoir voidage rates and the voidage efficiency of Tracts 79 and 84. Now, these are the two tracts that actually have production.

Q 41 does not have production?

A 41 does not have production. It has original oil-in-place and receives its equity in the unit on that basis. But, at any rate, I am making a comparison here to show the benefits gained by bringing these two producing wells into the Arco-Empire-Abo Unit and gain the advantage of the gas injection that is going on within the unit at the present time. The Column 1 oil rate indicates that Tracts 79 and 84 combined, prior to joining the Arco Unit produced 290 barrels per day. I believe this is the average for the first quarter of this year. After joining the

CHRISTIANSON-DIRECT

Arco Unit with the proposed increase we are talking about, the proposed increase would be 486 barrels a day, but there would be an improvement in net voidage rate shown in Column 2. These two tracts combined are now voiding at the oil rate of 290 barrels per day or voiding 370 reservoir barrels per day, but the voidage credited to those tracts would drop from 370 reservoir barrels per day to 224 reservoir barrels per day even though the production would increase from 290 a day to 486 a day.

Then, Column 3 is simply Column 2 divided by Column 1 and it is what we call the voidage efficiency factor, reservoir barrels per stock tank barrel and it has been brought to the Commission's attention at previous hearings, and you can see the improvement from the current approximately 1.28 reservoir barrels voided per stock tank barrel produced to a factor of about .46 reservoir barrels voided per stock tank barrels produced after the rate increase and after the joined unit.

Q Now, refer to Exhibit 4 and explain that?

A Exhibit 4, again, is a -- let me first lead into this by saying that Exhibits 4 and 5 are going to have the intent and the suggested changes we will be making in conjunction with Exhibits 4 and 5, are going to have

the intent of simply setting up the voidage and allowable calculations for the expanded project area on the same basis as they now are for the somewhat smaller project area. Exhibit 4 -- and I want to really direct your attention mainly to the top line of data on Exhibit 4 -- is the voidage formula that has been approved by the Commission for use in calculating voidage. We have submitted forms of this type to the Commission before, and I want to particularly point out that this calculation is the unit area voidage including Tracts 41, 79 and 84, and the calculated voidage up here is 56,912 reservoir barrels per day. This is calculated on the same basis as the figure that you are familiar with of 56,513 reservoir barrels per day which applied to the current unit area. We would be asking that the 56,912 reservoir barrels per day apply to the expanded project area and it is based on 1972 average rates for the project area including these three tracts that we would just now be posing to take in. That covers Exhibit 4.

Q How about Exhibit 5?

A Exhibit 5, then, simply takes the new daily average, 1972 voidage figure from Exhibit 4, using the same form, but starting over here on the righthand side in

CHRISTIANSON-DIRECT

Column 13 with the 56,912 figure back calculates a new base allowable over here in Column 1 of 33,242 barrels per day. This would be the base allowable we would have calculated had these three tracts 41, 79 and 84 been in the unit at the time we first applied for and got the basic allowable of 33,000 barrels a day in there.

Q Based on these exhibits, Nos. 4 and 5, what are you requesting?

A What we would like to ask, if the Commission please, that in Rules 3 and 4 of last adjusted in Order R-4549-B, that Rules 3 and 4, wherever the figure 56,513 reservoir barrels appears, change that to 56,912 reservoir barrels. Where ever the figure 33,000 barrels of oil per day appears, change that to 33,242 barrels of oil per day. And in Rule 4, the additional allowable formula, change 33,000 to 33,242, and change the factor of 39.76 to a factor of 41.05. And in the Rule for Discussion, change 7,555 barrels per day to 7,799 barrels per day.

As I mentioned before, these changes are simply to set up the voidage and allowable calculations on the same basis for the expanded project area as they already are from the smaller project area.

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Q Now, refer to Exhibit 6 and explain that?

A Exhibit 6 compares production and reservoir efficiency from the current project area before the unitization and after unitization and after gas injection. It also compares voidage situation as it is now with the current allowable with -- under the same conditions if we are allowed to include Tracts 41, 79 and 84 and get the allowable increase that we are asking to 41,041 barrels of oil per day from 40,555. I might just say that this is voidage type calculations as you have seen before, but under sub-heading "A", Arco-Empire-Abo Unit Area, which is the current project area, Line A-1, before the unit, September, 1973, the month immediately preceeding the unitization, the current project area would produce 23,252 barrels of oil per day and was voiding 61,812 reservoir barrels per day at a voidage efficiency factor of 2.66 reservoir-barrels-per-stock-tank barrel. By June of '75, with an oil rate of 40,555, we are calculating a net voidage rate after credit for gas injection of 22,106. In other words, the oil rate is increased from 23,252 to 40,555 barrels of oil per day, but the net reservoir voidage has been reduced from 61,802 reservoir barrels a day down to 22,106 reservoir barrels per day. This, of course, has

the familiar effect of slackening the pressure decline and aiding in recovery, and this efficiency factor reflects this increase in efficiency, dropping from 2.66 to 0.545. Then, the comparison between A and B here in Exhibit 6, simply indicates Line B-1, for example, shows the rate of 41,041 barrels per day after taking in these three new tracts, but essentially the same net voidage rate 22,103 reservoir barrels per day, and essentially the same efficiency factor after taking in these three tracts and after going up on the allowable, we will, in effect, have the same net voidage and the same efficiency as we do now.

Q Will any of the proposals or requests you are making of the Commission have an effect on the increased recovery from pressure maintenance as previously testified by you?

A No. In my opinion, that is to say there will certainly be no negative effect on recovery. There will be, in my opinion, a positive effect. I think the inclusion of these tracts should result in potential increased recovery because we will be able to operate more efficiently under the expanded project area.

Q In your opinion, will the approval of this Application be in the interest of conservation, prevention

of waste and protect correlative rights?

A Yes, it certainly will.

Q Will this increased rate be in line with Governmental policies of increasing domestic rates to help alleviate the current domestic shortage?

A Yes, sir, it will.

Q Who is running the oil at the present time?

A At the present time, only Amoco pipeline to my knowledge.

Q Is there any question about the capacity of the line to take this additional allowable?

A No, it definitely has sufficient capacity. There is no question. The answer is, yes, it does have sufficient capacity.

Q And all of your service facilities are adequate to handle that?

A Yes, they are.

MR. HINKLE: We would like to offer in evidence Exhibits 1 through 6.

MR. NUTTER: Exhibits 1 through 6 will be admitted in evidence.

(Whereupon, Applicant's Exhibits Nos. 1 through 6 were marked for identification, and were offered and admitted into evidence.)

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Christianson, you are going from a current reservoir voidage of 56,513 up to 56,912, and yet on your Exhibit 3 you show that these wells have, prior to joining the unit, a current voidage of 370 reservoir barrels per day, but the change from 56,513 up to 56,912 would be 399 barrels per day. How would you explain that discrepancy?

A Only that it is figured on the overall unit. That is, the change in voidage is figured on the overall unit where these numbers on the individual tracts are just on those tracts. There may be a little difference there.

Q Well, if we take the overall unit as it is without the tracts and added the voidage from the tracts that should give us the voidage for the overall unit with the tracts, shouldn't it?

A Well, you would think it would, yes. I can only say that each of these calculations made on the separate -- just the individual wells and the other made on the total unit as of '72 --

(Whereupon, a discussion was held off the record.)

CHRISTIANSON-CROSS

A The unit area voidage, as calculated in Exhibit 4, is based on the average of 1972 as it was when we asked for it originally, and this particular individual calculation is based on current conditions.

Q On Exhibit No. 3?

A Right, Exhibit 3. So, you have different factors. You have different pressures and different production.

Q In other words, I assume that based on the 1972 calculations, Tracts 79 and 84 were voiding 399 barrels per day?

A Yes.

Q But based on current conditions, they are voiding only 370 barrels per day?

A That is right. You can make that assumption.

Q Now, you mentioned all those various numbers that would have to be changed in Rules 3 and 4 and then the allowable formula and everything. I tried to take them down, but do you have those summarized so that you can leave them with us?

A I can give you a Xerox copy of the revised R-4549-B where I have crossed out each of those numbers — I talked about and added in the number that I gave you there

very rapidly.

Q If you could leave that for convenience in preparing an order on this, Mr. Christianson, I would appreciate it.

A I would be happy to.

MR. NUTTER: Are there any other questions of Mr. Christianson? He may be excused.

(Witness dismissed.)

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

MR. HINKLE: That's all.

MR. NUTTER: Does anyone have anything they wish to offer in Case No. 5505?

MR. KELLAHIN: If the Examiner please, I am Jason Kellahin of Kellahin and Fox, Santa Fe, appearing for C and K Petroleum, Inc. C and K is the operator of Tract No. 79, being the southeast of the southwest, Section 27, Township 17 South, Range 28 East, supports the Application of Atlantic Richfield in this case. The well on this particular unit is capable of making the allowable that would be assigned to it and all of the owners have agreed to join the unit.

MR. CARR: Mr. Examiner, the Commission has

CHRISTIANSON-CROSS

received a letter from Tenneco Oil Company in support of the Application of Atlantic Richfield in this case.

BY MR. NUTTER:

Q Mr. Christianson, when should an order on the allowable provision go into effect? I realize that the joinder is being circulated to the unit members, but when is the proposed effective date on that?

A Well, of course, we don't know. It depends on they come in. It is a little difficult to estimate, but probably we should be in touch with you -- there is quite a bit of paper work we will have to go through, you know, getting some approvals from the U.S.G.S.

MR. HINKLE: Would it be possible to make the order effective the first of the month following the time when they advise you that all of the paper work has been completed committing this acreage?

(Whereupon, a discussion was held off the record.)

MR. NUTTER: Does anyone have anything they wish to offer in Case 5505? We will take the case under advisement.

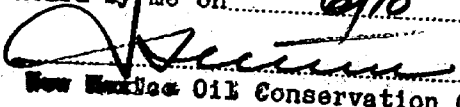
CASE 5505

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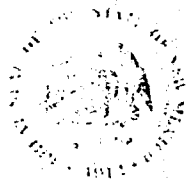
STATE OF NEW MEXICO)
COUNTY OF SANTA FE) SS.

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.

COURT REPORTER

I do hereby certify that the foregoing is
a complete record of the proceedings in
the Examiner hearing of Case No. 5505
heard by me on 6/10, 1975
, Examiner
New Mexico Oil Conservation Commission

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OIL CONSERVATION COMMISSION

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

87501

July 2, 1975

I. R. TRUJILLO
CHAIRMAN

LAND COMMISSIONER
PHIL R. LUCERO
MEMBER

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

Re: CASE NO. 5505
ORDER NO. R-4549-C

Mr. Clarence Hinkle

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

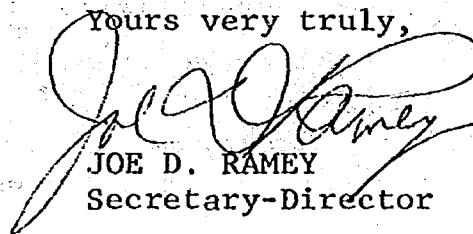
Applicant:

Atlantic Richfield Co.

Dear Sir:

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

Yours very truly,


JOE D. RAMEY
Secretary-Director

JDR/fd

Copy of order also sent to:

Hobbs OCC X
Artesia OCC X
Aztec OCC

Other

Case No. 5177
Order No. R-4549-B

accrue to the gas injection credit bank should be equal to 100 percent of the average of the total monthly injection volumes for the previous three months, not including the month being reported.

IT IS THEREFORE ORDERED:

(1) That Rule 3 of the Special Rules and Regulations for the Empire-Abo Pressure Maintenance Project as promulgated by Order No. R-4549, as amended by Order No. R-4549-A, is hereby amended to read in its entirety as follows:

"RULE 3. That the maximum daily project allowable shall be an amount of oil which will result in reservoir voidage no greater than the average daily reservoir voidage in the project area for calendar year 1972 (56,912 reservoir barrels) or 33,000 33,242 barrels of oil per day, whichever is less, except that when injection of 95 percent of all available residue gas is achieved, the maximum daily project allowable shall be an amount of oil which will result in reservoir voidage no greater than the average daily reservoir voidage in the project area for calendar year 1972 (56,912 reservoir barrels) or 41,041 40,555 barrels of oil per day, whichever is less."

(2) That Rule 4 of the Special Rules and Regulations for the Empire-Abo Pressure Maintenance Project is hereby amended to read in its entirety as follows:

"RULE 4. That upon commencement of gas injection and for as long thereafter as such injection continues, extra allowable in addition to the 33,000 barrels 33,242 per day described above may be assigned to the project area, provided that such additional allowable shall be based upon the proportion of residue gas available for injection which is actually injected into the unitized formation and shall be computed in accordance with the following formula:

Additional Allowable
in Excess of 33,000
BOPD

$$41,050 \left[2 \left(\frac{\text{MCF gas inj. previous month} \times 10}{\text{MCF residue gas available prev. month}} \right) + \left(\frac{\text{MCF gas inj. previous month} \times 10}{\text{MCF residue gas available previous month}} \right) \right]$$

33,242

That the maximum additional allowable which may be earned by gas injection shall be 2,555 barrels per day. That this maximum may be earned by the injection of 95 percent of the available residue gas into the unitized formation; that gas volumes in excess of said 95 percent which are injected into the unitized formation shall be credited each month to a gas injection bank account which shall be permitted to accrue such gas injection credits up to 100 percent of the average of the total monthly injection volumes for the three previous months, not including the month being reported; that during such times as injection well failures, injection plant shutdowns, and other temporary conditions of unforeseen nature which prevent the injection of at least 95 percent of the available residue gas, said gas injection bank account may be charged a sufficient volume to add to the actual volume of injection achieved to equal 95 percent of the available residue gas for the month. In the event there are insufficient credits accrued to the gas injection bank account to bring actual injection plus applied credits up to 95 percent of available residue gas, production shall be reduced to 33,000 barrels of oil per day plus the amount which the actual injection plus the accrued credits will actually earn. Production beyond this amount shall be considered overproduction and shall be compensated for by underproduction during the following month.

For the purpose of these rules, "Available Residue Gas" shall be defined as being all gas produced from the unitized formation less plant shrinkage, plant fuel, and lease fuel required for operation of the lease.

No raw gas nor plant residue gas attributable to the project shall be sold or otherwise disposed of by any means other than injection into the unitized formation except during emergency situations of temporary nature."

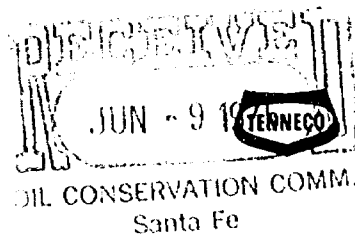
(3) That Rule 5 of the Special Rules and Regulations for the Empire-Abo Pressure Maintenance Project is hereby amended to read in its entirety as follows:

"RULE 5. That all calculations of reservoir voidage shall be made in accordance with the formula set forth in Attachment "A" to this order entitled "EMPIRE-ABO UNIT AREA-Reservoir Voidage Formula - Gas and Water Injection Credit" utilizing the reservoir and fluid data set forth in Attachment "B" to this order entitled EMPIRE-ABO UNIT AREA - Table of Fluid Properties."

(4) That Rule 14 of the Special Rules and Regulations for the Empire-Abo Pressure Maintenance Project is hereby amended to read in its entirety as follows:

Tenneco Oil
A Tenneco Company

Suite 1200
Lincoln Tower Building
Denver, Colorado 80203
(303) 292-9920



June 5, 1975

File

New Mexico Oil Conservation Commission
Post Office Box 2088
Santa Fe, New Mexico 87501

Attention: Mr. J. D. Ramey

RE: Proposed Expansion
Empire Abo Unit
Case 5505

JK

Gentlemen:

Tenneco Oil Company wishes to support the cause of the applicant, The Atlantic Richfield Company in Case 5505. This proposed expansion of the Empire Abo Unit pressure maintainance project includes three tracts in which Tenneco has an interest.

It is requested the Commission enter a favorable ruling in this case.

Very truly yours,

TENNECO OIL COMPANY

D.D. Myers

D. D. Myers
Division Production Manager

JAD/fran

CC: Atlantic Richfield Company
P. O. Bpx 1610
Midland, Texas 79701
Attention: Mr. Jerry Tweed

EMPIRE ABO POOL TOTAL OIL RATES
With
ARCO EMPIRE ABO UNIT EXPANDED ALLOWABLE
PRODUCTION of 41,041 BOPD

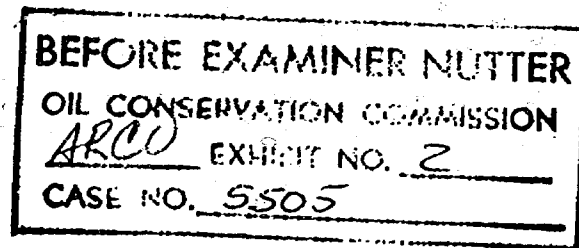
(Date of Estimate: June 1, 1975)

	(1) <u>DAILY OIL RATE</u> <u>(BOPD)</u>	(2) <u>DAILY OIL RATE</u> <u>(BOPD)</u>	(3) <u>DAILY OIL RATE</u> <u>(BOPD)</u>
a) ARCO-Empire Abo Unit Production: (Including Tracts 41, 79, 84)	41,041	41,041	41,041
b) Citgo-Empire Abo Unit Production:	350*	295**	389***
c) All Non-Unit Empire Abo Pool Production:	477*	431**	545***
Empire Abo Pool Total: (a+b+c)	41,868	41,767	41,975

(*Average Oil Rate for 7-month period from September 1974 through March 1975.)

(**Average Oil Rate for February and March 1975.)

(***Average Oil Rates for month of highest oil production from Citgo Unit (December 1974), plus month of highest oil production for all Non-Unit (October 1974).)



EMPIRE ABO POOL TOTAL OIL RATES
With
ARCO EMPIRE ABO UNIT EXPANDED ALLOWABLE
PRODUCTION of 41,041 BOPD

(Date of Estimate: June 1, 1975)

	(1) <u>DAILY OIL RATE</u> <u>(BOPD)</u>	(2) <u>DAILY OIL RATE</u> <u>(BOPD)</u>	(3) <u>DAILY OIL RATE</u> <u>(BOPD)</u>
a) ARCO-Empire Abo Unit Production: (Including Tracts 41, 79, 84)	41,041	41,041	41,041
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(*Average Oil Rate for 7-month period from September 1974 through March 1975.)

(**Average Oil Rate for February and March 1975.)

(***Average Oil Rates for month of highest oil production from Citgo Unit (December 1974), plus month of highest oil production for all Non-Unit (October 1974).)

BEFORE EXAMINATION
OIL CONSERVATION
EXHIBIT NO. <u>2</u>
CASE NO. <u>5505</u>

EMPIRE ABO POOL

Comparison of Production and Voidage Efficiency
for
Tracts 79 and 84 Before and After Joining
ARCO-Empire Abo Unit

	(1)	(2)	(3)
<u>Tracts 79 & 84 Combined:</u>	<u>Oil Rate</u> <u>(BOPD)</u>	<u>Net Voidage</u> <u>Rate</u> <u>(RVB/Day)</u>	<u>Voidage</u> <u>Efficiency</u> <u>RVB/STB</u> <u>(2)/(1)</u>
Prior to Joining ARCO Unit:	290	370	1.276
After Joining ARCO Unit:	486	224	0.461

BEFORE EXAMINER NOTER
OIL CONSERVATION & COMMISSION
EXHIBIT NO. 3
CASE NO. 5505

ESTIMATE ABO UNIT VOIDAGE CALCULATION: Expanded Project Area - 1972 - Average Daily Voidage from Expanded Project Area.

Equation 1: $V_{rvb} = Q_o [B_o + (R_{pn} - R_s) B_g] + [Q_{wp} - (Q_{we} + Q_{wl})] B_w$

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	Q_o (BOPD)	R_p (MCF/BO)	Q_{wp} (BWPD)	R_s (MCF/BO)	$R_{pn}-R_s$ (MCF/BO)	B_g (RVB/BBL)	$B_o +$ $(R_{pn}-R_s) B_g$ (RVB/BBL)	$Q_o B_o +$ $(R_{pn}-R_s) B_g$ (RVB/DAY)	Q_{we} (BWPD)	$Q_{we} + Q_{wl}$ (BWPD)	$Q_{wp} - (Q_{we} + Q_{wl})$ (BWPD)	$Q_{wp} - (Q_{we} + Q_{wl}) \times B_w$ (RSVB/DAY)	Total Net Voidage (8+12) (35VS/DAY)
UNIT AREA	24384	1.3806750	2128	.825	.5556750	.8946367	2.3226367	56635.2	1850.9	1850.9	277.1	277.1	56912.3
VOIDAGE:													
Non-Unit	1301	1.6364335	19	.825	.8114335	1.3064079	2.7344079	3557.5	99.6	99.6	- 80.6	- 80.6	3476.9
Pool Total	25685	1.3936301	2147	.825	.5686301	.9154944	2.3434944	60192.7	1950.5	1950.5	196.5	196.5	60389.2

PRODUCTION

RESERVOIR FLUID PROPERTIES

$Q_o =$	$B_o =$	1.428
$R_p =$	$R_s =$.825
$Q_{wp} =$	$B_g =$	1.61
$Q_{wl} =$	$Q_{we} =$	8.3 BWPD/well
$G/C_p =$	$B_w =$	1.0
	$P_r =$	1420

BEFORE EXAMINED NUTTER
OIL COMPANY
SECTION

CASE NO. 5505

Reservoir Voidage Efficiency =

EXPIRE ABO UNIT VOIDAGE CALCULATION: Oil Rate calculated as base prior to gas injection on the same basis as the previous oil base was calculated using the extended project Area.

Equation 1: $V_{rvb} = Q_o [B_o + (R_{pn} - R_s) B_g] + [Q_{wp} - (Q_{we} + Q_{wl})] \cdot B_w$

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	Q_o (BOFD)	R_p (MCF/BO)	Q_{wp} (BMFD)	R_s (MCF/BO)	$R_{pn}-R_s$ (MCF/BO)	$(R_{pn}-R_s) B_g$ (RVB/BBL)	$B_o + (R_{pn}-R_s) B_g$ (RVB/BBL)	$Q_o B_o + (R_{pn}-R_s) B_g$ (RVB/DAY)	Q_{we} (BMFD)	$Q_{we} + Q_{wl}$ (BMFD)	$Q_{wp} - (Q_{we} + Q_{wl})$ (BMFD)	$Q_{wp} - (Q_{we} + Q_{wl}) \times B_w$ (RSVB/DAY)	Total Net Voidage (8+12) (RSVB/DAY)
NIT AREA VOIDAGE:	33,242	.974	1550	.795	.179	.30603	1.72109	57212.6	1850.3	1850.3	-300.3	-300.3	56912.3

PRODUCTION

$Q_o =$
 $R_p =$
 $Q_{wp} =$
 $Q_{wl} =$
 $GL/GP =$

RESERVOIR FLUID PROPERTIES

$B_o = 1.415$
 $R_s = .795$
 $B_g = 1.710$
 $Q_{we} = 1850.3$
 $B_w = 1.0$
 $P_r = 1343$

BEFORE EXAMINED NUTTER
OIL CONSERVATION DIVISION
CASE NO. 5505

Reservoir Voidage Efficiency = $56912.3 / 33242 = 1.71206$ RSVB/STBO

EMPIRE ABO POOL

PRODUCTION AND RESERVOIR VOIDAGE PERFORMANCE
ARCO-Emple Abo Unit - Effective Date: October 1, 1973

Date Prepared June 5, 1975

EMPIRE ABO POOL

A. ARCO-Emple Abo Unit (Current Project Area)

1. Before Unit - September 1973:
2. June 1975 (estimated):

(1)	(2)	(3)
OIL RATE (BOPD)	RESERVOIR NET VOIDAGE RATE RVB/SEP DAY	RESERVOIR VOIDAGE EFFICIENCY RVB/STB (\$)/(2)

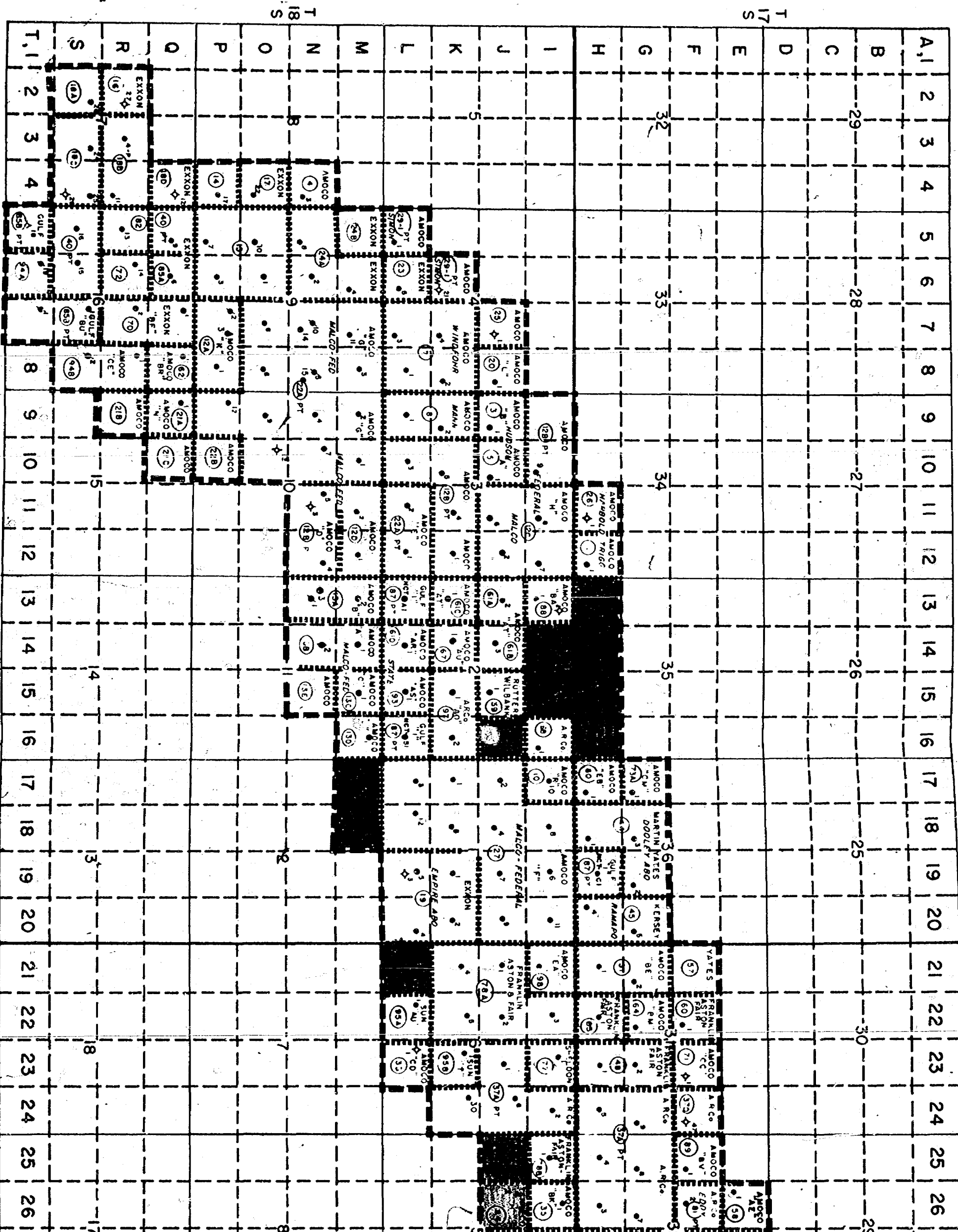
23,252	61,802	2.66
40,555	22,106	0.545

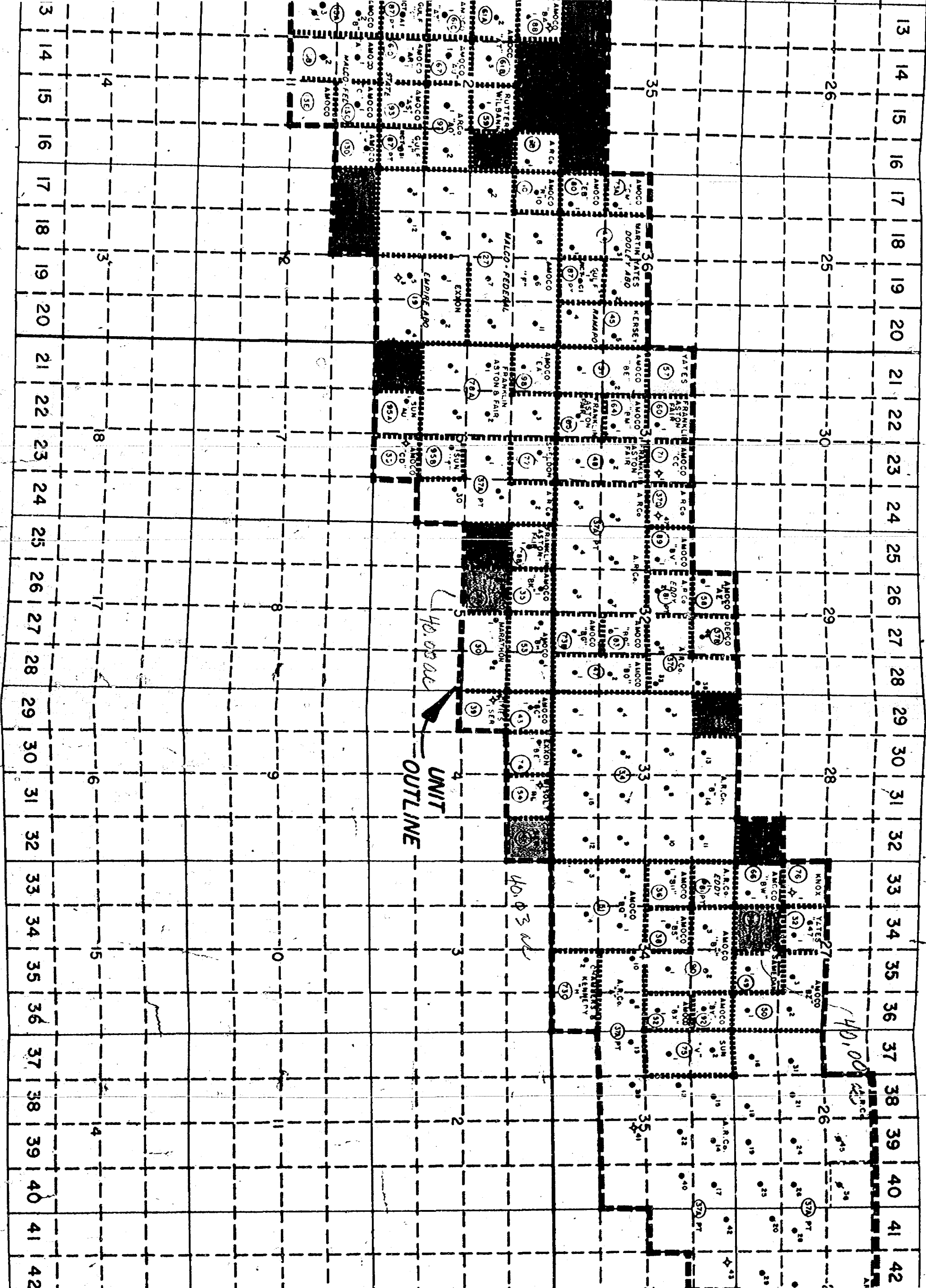
B. ARCO-Emple Abo Unit (Expanded Project, Area including Tr's. 41, 79, 84):

1. June 1975 (estimated)

41,041	22,103	0.539
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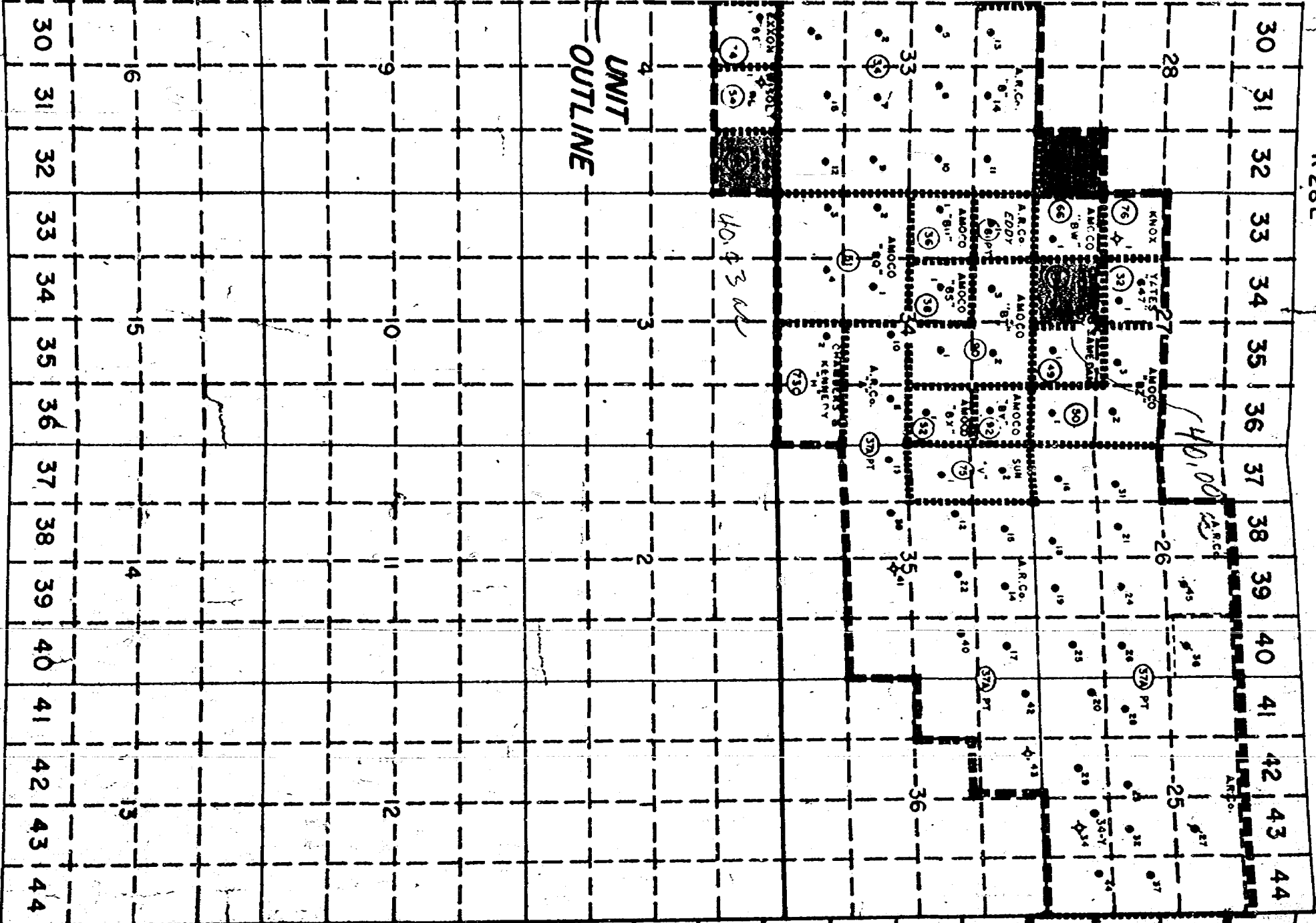
BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 6
CASE NO. 5525



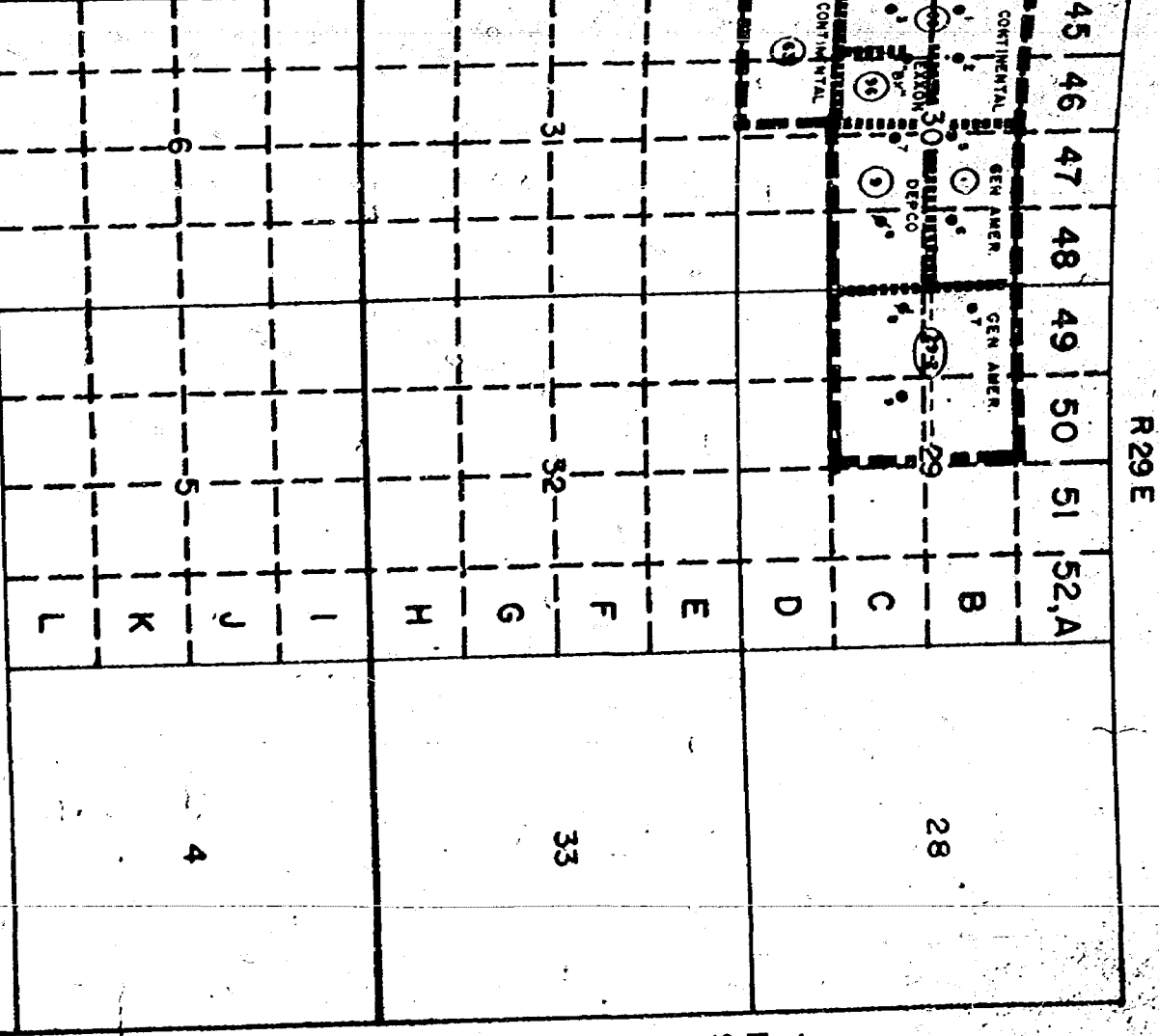


R28E

R29E



UNIT
OUTLINE



L E G E N D

UNIT BOUNDARY
TRACT BOUNDARY
TRACT NUMBER
PT PARTIAL TRACTS

PROPOSED TRACTS TO BE
ADDED TO PROJECT AREA

BEFORE EXAMINER
OIL CONSERVATION COMMISSION

ARCO EXHIBIT NO.

CASE NO. 5505

EMPIRE ABO UNIT
EDDY COUNTY, NEW MEXICO

REVISED: JUNE 2, 1975



T 18 S

T 17 S

EMPIRE ABO POOL

Comparison of Production and Voidage Efficiency
for

Tracts 79 and 84 Before and After Joining
ARCO-Empire Abo Unit

(Tract 41 does not have production)

Tracts 79 & 84 Combined:

Prior to Joining ARCO Unit:

After Joining ARCO Unit:

(1)
Oil Rate
(BOPD)

(2)
Net Voidage
Rate
(RVB/Day)

(3)
Voidage
Efficiency
RVB/STB
(2)/(1)

290

370

1.276

486

224

0.461

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
ARCO EXHIBIT NO. 3
CASE NO. 5505

EMPIRE ABO POOL

PRODUCTION AND RESERVOIR VOIDAGE PERFORMANCE
Effective Date: October 1, 1973

ARCO-Emple Abo Unit
Date Prepared June 5, 1975

(1)	(2)	(3)
OIL RATE (BOPD)	RESERVOIR NET VOIDAGE RATE RVB/STB DAY	RESERVOIR VOIDAGE EFFICIENCY RVB/STB (1)/(2)

EMPIRE ABO POOL

A. ARCO-Emple Abo Unit (Current Project Area)

1. Before Unit - September 1973:
2. June 1975 (estimated):

23,252	61,802	2.66
40,555	22,106	0.545

B. ARCO-Emple Abo Unit (Expanded Project, Area including Tr's. 41, 79, 84):

1. June 1975 (estimated)

41,041	22,103	0.539
--------	--------	-------

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
ARCO PROJECT NO. 6
CASE NO. 5505

Case 5505

CLARENCE E. HINKLE
W. E. BONDURANT, JR. (914-1073)
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.

JAMES H. BOZARTH
RONALD G. HARRIS
JAMES H. ISBELL

LAW OFFICES
HINKLE, BONDURANT, COX & EATON

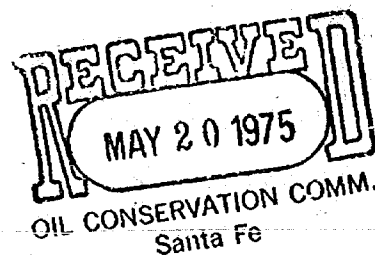
600 HINKLE BUILDING
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ROSWELL, NEW MEXICO 88201

May 19, 1975

TELEPHONE (809) 822-8510

MR. ISBELL LICENSED
IN TEXAS ONLY

MIDLAND, TEXAS OFFICE
521 MIDLAND TOWER
(818) 683-4691



Oil Conservation Commission
Box 2088
Santa Fe, New Mexico 87501

Gentlemen:

We enclose in triplicate application of Atlantic Richfield to increase the project area of the Empire Abo Pressure Maintenance Project and to increase the project allowable.

This matter has been discussed with Dan Nutter in order to place the same on the examiner's hearing docket for June 11.

Yours very truly,

HINKLE, BONDURANT, COX & EATON

By Clarence E. Hinkle

CEH:cs
Enc.

DOCKET MAILED

Date

Case 5505

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

APPLICATION OF ATLANTIC RICHFIELD
COMPANY, UNIT OPERATOR OF THE EMPIRE
ABO UNIT, TO INCREASE THE PROJECT
AREA BY 120.03 ACRES, AND FOR AN
INCREASED PROJECT ALLOWABLE FOR THE
EMPIRE ABO PRESSURE MAINTENANCE
PROJECT AS APPROVED BY ORDER R-4549
AND AMENDED BY ORDERS R-4549A AND
R-4549B FROM 40,555 BARRELS PER DAY
TO 41,041.

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

Comes Atlantic Richfield, Unit Operator of the Empire Abo Unit, acting by and through the undersigned attorneys, and hereby makes application to increase the project area by 120.03 acres, and for an increased project allowable for the Empire Abo Pressure Maintenance Project as approved by Order R-4549 and amended by Orders R-4549A and R-4549B from 40,555 barrels per day to 41,041, and in support thereof respectfully shows:

1. That as a result of Case No. 5135, Order No. R-4549A and Case No. 5177, Order No. R-4549B, the Commission has on file the latest plats 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 dated June 15, 1973, as subsequently amended by Order R-4549A, dated January 15, 1974, and Order R-4549B, dated April 30, 1974.

3. That Finding 5 of Order R-4549B limits production from the project area as described in Finding 4 of Order R-4549, expanded by Order R-4549B, to the average reservoir voidage for the calendar year 1972 or 40,555 barrels of oil per day, whichever is less, after gas injection has been achieved.

4. The allowable figure of 40,555 barrels of oil per day testified to at the hearing of February 27, 1974, Case No. 5177, Order R-4549B, was based on the size of the unitized project area as it was on that date.

5. That owners of three additional tracts comprising 120.03 acres and containing two Abo producing wells, now wish to commit these tracts to the Unit. These tracts are as follows:

<u>Tract Number</u>	<u>Unit Designation</u>	<u>Location</u>	<u>Tract Acreage</u>
41	I-32	Lot 1 (NE $\frac{1}{4}$ NE $\frac{1}{4}$) Section 4, Township 18 South, Range 28 East	40.03
79	D-34	SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 27, Township 17 South, Range 28 East	40.00
84	J-26	SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 5, Township 18 South, Range 28 East	40.00
			<u>120.03</u>

6. That these additional tracts were not considered in the Project Area in arriving at the 40,555 barrels of oil per day project allowable provided for in Order R-4549B.

7. Applicant requests an increase above the project allowable of 40,555 barrels of oil per day previously granted for the period after gas injection to 41,041 barrels of oil per day.

8. In the opinion of applicant, said pressure maintenance project, project area expansion and allowable increase are 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 June 11, 1975.

Respectfully submitted,

ATLANTIC RICHFIELD COMPANY

By 

HINKLE, BONDURANT, COX & EATON
Attorneys for Applicant
Box 10
Roswell, New Mexico 88201

Case 5505

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

APPLICATION OF ATLANTIC RICHFIELD
COMPANY, UNIT OPERATOR OF THE EMPIRE
ABO UNIT, TO INCREASE THE PROJECT
AREA BY 120.03 ACRES, AND FOR AN
INCREASED PROJECT ALLOWABLE FOR THE
EMPIRE ABO PRESSURE MAINTENANCE
PROJECT AS APPROVED BY ORDER R-4549
AND AMENDED BY ORDERS R-4549A AND
R-4549B FROM 40,555 BARRELS PER DAY
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Oil Conservation Commission
P.O. Box 2088
Santa Fe, New Mexico 87501

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1. That as a result of Case No. 5135, Order No. R-4549A and Case No. 5177, Order No. R-4549B, the Commission has on file the latest plats 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 dated June 15, 1973, as subsequently amended by Order R-4549A, dated January 15, 1974, and Order R-4549B, dated April 30, 1974.
3. That Finding 5 of Order R-4549B limits production from the project area as described in Finding 4 of Order R-4549, expanded by Order R-4549B, to the average reservoir voidage for the calendar year 1972 or 40,555 barrels of oil per day, whichever is less, after gas injection has been achieved.

Case 5505

4. The allowable figure of 40,555 barrels of oil per day testified to at the hearing of February 27, 1974, Case No. 5177, Order R-4549B, was based on the size of the unitized project area as it was on that date.

5. That owners of three additional tracts comprising 120.03 acres and containing two Abo producing wells, now wish to commit these tracts to the Unit. These tracts are as follows:

<u>Tract Number</u>	<u>Unit Designation</u>	<u>Location</u>	<u>Tract Acreage</u>
41	I-32	Lot 1 (NE $\frac{1}{4}$ NE $\frac{1}{4}$) Section 4, Township 18 South, Range 28 East	40.03
79	D-34	SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 27, Township 17 South, Range 28 East	40.00
84	J-26	SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 5, Township 18 South, Range 28 East	40.00 <u>120.03</u>

6. That these additional tracts were not considered in the Project Area in arriving at the 40,555 barrels of oil per day project allowable provided for in Order R-4549B.

7. Applicant requests an increase above the project allowable of 40,555 barrels of oil per day previously granted for the period after gas injection to 41,041 barrels of oil per day.

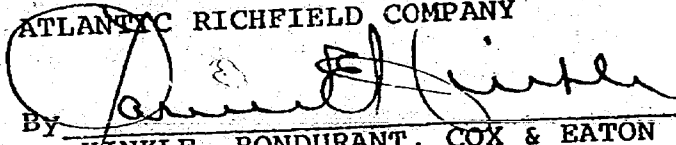
8. In the opinion of applicant, said pressure maintenance project, project area expansion and allowable increase are in the interest of conservation, prevention of waste, the protection of correlative rights, and will tend to promote the greatest ultimate recovery of oil and gas from that portion of 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 June 11, 1975.

Respectfully submitted,

ATLANTIC RICHFIELD COMPANY

By


HINKLE, BONDURANT, COX & EATON
Attorneys for Applicant
Box 10
Roswell, New Mexico 88201

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

APPLICATION OF ATLANTIC RICHFIELD
COMPANY, UNIT OPERATOR OF THE EMPIRE
ABO UNIT, TO INCREASE THE PROJECT
AREA BY 120.03 ACRES, AND FOR AN
INCREASED PROJECT ALLOWABLE FOR THE
EMPIRE ABO PRESSURE MAINTENANCE
PROJECT AS APPROVED BY ORDER R-4549
AND AMENDED BY ORDERS R-4549A AND
R-4549B FROM 40,555 BARRELS PER DAY
TO 41,041.

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

Comes Atlantic Richfield, Unit Operator of the Empire Abo Unit, acting by and through the undersigned attorneys, and hereby makes application to increase the project area by 120.03 acres, and for an increased project allowable for the Empire Abo Pressure Maintenance Project as approved by Order R-4549 and amended by Orders R-4549A and R-4549B from 40,555 barrels per day to 41,041, and in support thereof respectfully shows:

1. That as a result of Case No. 5135, Order No. R-4549A and Case No. 5177, Order No. R-4549B, the Commission has on file the latest plats 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 dated June 15, 1973, as subsequently amended by Order R-4549A, dated January 15, 1974, and Order R-4549B, dated April 30, 1974.

3. That Finding 5 of Order R-4549B limits production from the project area as described in Finding 4 of Order R-4549, expanded by Order R-4549B, to the average reservoir voidage for the calendar year 1972 or 40,555 barrels of oil per day, whichever is less, after gas injection has been achieved.

Case 5565

4. The allowable figure of 40,555 barrels of oil per day testified to at the hearing of February 27, 1974, Case No. 5177, Order R-4549B, was based on the size of the unitized project area as it was on that date.

5. That owners of three additional tracts comprising 120.03 acres and containing two Abo producing wells, now wish to commit these tracts to the Unit. These tracts are as follows:

<u>Tract Number</u>	<u>Unit Designation</u>	<u>Location</u>	<u>Tract Acreage</u>
41	I-32	Lot 1 (NE $\frac{1}{4}$ NE $\frac{1}{4}$) Section 4, Township 18 South, Range 28 East	40.03
79	D-34	SE $\frac{1}{4}$ SW $\frac{1}{4}$ Section 27, Township 17 South, Range 28 East	40.00
84	J-26	SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 5, Township 18 South, Range 28 East	40.00
			<u>120.03</u>

6. That these additional tracts were not considered in the Project Area in arriving at the 40,555 barrels of oil per day project allowable provided for in Order R-4549B.

7. Applicant requests an increase above the project allowable of 40,555 barrels of oil per day previously granted for the period after gas injection to 41,041 barrels of oil per day.

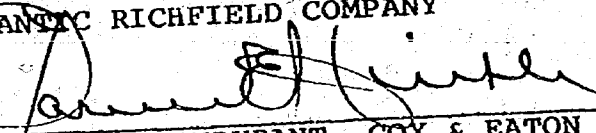
8. In the opinion of applicant, said pressure maintenance project, project area expansion and allowable increase are in the interest of conservation, prevention of waste, the protection of correlative rights, and will tend to promote the greatest ultimate recovery of oil and gas from that portion of 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 June 11, 1975.

Respectfully submitted,

ATLANTIC RICHFIELD COMPANY

By


HINKLE, BONDURANT, COX & EATON
Attorneys for Applicant
Box 10
Roswell, New Mexico 88201

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. 5505
Order No. R-4549-C

THE APPLICATION OF THE ATLANTIC
RICHFIELD COMPANY FOR PRESSURE
MAINTENANCE PROJECT EXPANSION,
EDDY COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on June 10, 1975,
at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 1st day of July, 1975, 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, The Atlantic Richfield Company,
is the operator of the Empire-Abo Pressure Maintenance Project,
Empire-Abo Pool, Eddy County, New Mexico, which project was
authorized by Commission Order No. R-4549, expanded by Order
No. R-4549-A, and is operated pursuant to Special Rules and
Regulations promulgated by Order No. R-4549, as amended by
Orders Nos. R-4549-A and R-4549-B.

(3) That the applicant seeks the further expansion of
the pressure maintenance project area as defined by said
Order No. R-4549 and expanded by said Order No. R-4549-A by
the inclusion of the following described lands, which are to
be committed to the Empire Abo Unit Area:

TOWNSHIP 17 SOUTH, RANGE 28 EAST, NMPM
Section 27: SE/4 SW/4, being 40.00 acres

TOWNSHIP 18 SOUTH, RANGE 28 EAST, NMPM
Section 4: NE/4 NE/4, being 40.03 acres
Section 5: SE/4 NW/4, being 40.00 acres

-2-

Case No. 5505

Order No. R-4549-C

(4) That in conjunction with the expansion of said project area, applicant also seeks the amendment of Rule 3 of the Special Rules and Regulations for the Empire Abo Pressure Maintenance Project as promulgated by Order No. R-4549 and amended by Orders Nos. R-4549-A and R-4549-B to provide that the maximum daily project allowable will result in average daily reservoir voidage no greater than the reservoir voidage in the project area, as expanded, for calendar year 1972 (56,912 reservoir barrels) or 33,242 barrels of oil per day, whichever is less, except that when injection of 95 percent of all available residue gas is achieved, the project allowance would be an amount of oil no greater than would result in average daily reservoir voidage in the project area, as expanded, for calendar year 1972 (56,912 reservoir barrels) or 41,041 barrels of oil per day, whichever is less.

(5) That to accomplish the aforesaid increase in project base allowable and maximum project allowable, certain modifications to Rule 4 of the project rules would be necessary.

(6) That the proposed expansion of the Empire-Abo Pressure Maintenance Project Area and the concurrent increase in base allowable and maximum project allowable is in the interest of increased recovery of oil and gas, will prevent waste and will not violate correlative rights, and should be approved.

IT IS THEREFORE ORDERED:

(1) That the project area for the Empire-Abo Pressure Maintenance Project is hereby expanded to include therein:

TOWNSHIP 17 SOUTH, RANGE 28 EAST, NMPM
Section 27: SE/4 SW/4

TOWNSHIP 18 SOUTH, RANGE 28 EAST, NMPM
Section 4: NE/4 NE/4
Section 5: SE/4 NW/4

being 120.03 acres, all in Eddy County, New Mexico.

(2) That Rule 3 of the Special Rules and Regulations for the Empire-Abo Pressure Maintenance Project as promulgated by Order No. R-4549, as amended by Orders Nos. R-4549-A and R-4549-B, is hereby amended to read in its entirety as follows:

"RULE 3. That the maximum daily project allowable shall be an amount of oil which will result in reservoir voidage no greater than the average daily reservoir voidage in the project area for calendar year 1972 (56,912 reservoir barrels) or 33,242 barrels of oil per day,

-3-

Case No. 5505

Order No. R-4549-C

whichever is less, except that when injection of 95 percent of all available residue gas is achieved, the maximum daily project allowable shall be an amount of oil which will result in reservoir voidage no greater than the average daily reservoir voidage in the project area for calendar year 1972 (56,912 reservoir barrels) or 41,041 barrels of oil per day, whichever is less."

(3) That Rule 4 of the Special Rules and Regulations for the Empire-Abo Pressure Maintenance Project is hereby amended to read in its entirety as follows:

"RULE 4. That upon commencement of gas injection and for as long thereafter as such injection continues, extra allowable in addition to the 33,242 barrels per day described above may be assigned to the project area, provided that such additional allowable shall be based upon the proportion of residue gas available for injection which is actually injected into the unitized formation and shall be computed in accordance with the following formula:

Additional Allowable

in Excess of 33,242 = 41.05
BOPD

$$2 \left(\frac{\text{MCF gas inj. previous month} \times 10}{\text{MCF residue gas available prev. month}} \right) + \left(\frac{\text{MCF gas inj. previous month} \times 10}{\text{MCF residue gas available previous month}} \right)$$

That the maximum additional allowable which may be earned by gas injection shall be 7,799 barrels per day. That this maximum may be earned by the injection of 95 percent of the available residue gas into the unitized formation; that gas volumes in excess of said 95 percent which are injected into the unitized formation shall be credited each month to a gas injection bank account which shall be permitted to accrue such gas injection credits up to 100 percent of the average of the total monthly injection volumes for the three previous months, not including the month being reported; that during such times as injection well failures, injection plant shutdowns, and other temporary conditions of unforeseen nature which prevent the injection of at least 95 percent of the available residue gas, said gas injection bank account may be charged a sufficient volume to add to the actual volume of injection achieved to equal 95 percent of the available residue gas for the month. In the event there are insufficient credits accrued to the

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Case No. 5505
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gas injection bank account to bring actual injection plus applied credits up to 95 percent of available residue gas, production shall be reduced to 33,242 barrels of oil per day plus the amount which the actual injection plus the accrued credits will actually earn. Production beyond this amount shall be considered overproduction and shall be compensated for by underproduction during the following month.

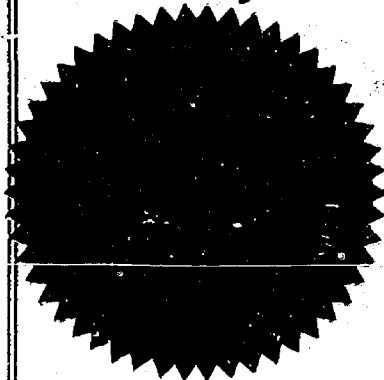
For the purpose of these rules, "Available Residue Gas" shall be defined as being all gas produced from the unitized formation less plant shrinkage, plant fuel, and lease fuel required for operation of the lease.

No raw gas nor plant residue gas attributable to the project shall be sold or otherwise disposed of by any means other than injection into the unitized formation except during emergency situations of temporary nature."

(4) That the effective date of this order shall be the effective date of ratification of the unit agreement by the parties concerned.

(5) 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.



S E A L

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Phil R. Lucero
PHIL R. LUCERO, Member

Joe D. Ramey
JOE D. RAMEY, Member & Secretary

dr/

The Atlantic Richfield Co.

to inc project area 120.03
inc proj acc'n
Empire

R-4549 R 4549 A & 4549 B
from 40,555 to 41,041 bpd

Tract 41 79 84
40+1 NENE 4-18-28 40.03
SESW 271728 40.0
SESW 5-18-28 40.0

unorthodox gas well loc
comp pooling Eddy Co
1315

~~1320~~ FS & WL 33 17 28

10,500 Marrow

W/2 of 33

acc mud int
below base of Empire and
utilized from down to
base of Penn w/2 sec 33

Penn

cost of drly
op cost
super
appl as op
chg for risk

Tenneco
Conth } 40 acres
have not
agreed.

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. 5505

Order No. R-4549-C

THE APPLICATION OF THE ATLANTIC
RICHFIELD COMPANY FOR PRESSURE
MAINTENANCE PROJECT EXPANSION,
EDDY COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on June 10, 1975,
at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this day of July, 1975, 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, The Atlantic Richfield Company, is the
operator of the Empire-Abo Pressure Maintenance Project, Empire-Abo
Pool, Eddy County, New Mexico, which project was authorized by
Commission Order No. R-4549, expanded by Order No. R-4549-A, and is
operated pursuant to Special Rules and Regulations promulgated by
Order No. R-4549, as amended by Orders Nos. R-4549-A and
R-4549-B.

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(3) That the applicant seeks the further expansion of the pressure maintenance project area as defined by said Order No. R-4549 and expanded by said Order No. R-4549^A by the inclusion of the following described lands, which are to be committed to the Empire Abo Unit Area:

TOWNSHIP 17 SOUTH, RANGE 28 EAST, NMPM
Section 27: SE/4 SW/4, being 40.00 acres

TOWNSHIP 18 SOUTH, RANGE 28 EAST, NMPM
Section 4: NE/4 NE/4, being 40.03 acres
Section 5: SE/4 NW/4, being 40.00 acres

(4) That ~~in conjunction with the~~ expansion of said project area, applicant ^{also} seeks the amendment of Rule 3 of the Special Rules and Regulations for the Empire Abo Pressure Maintenance Project as promulgated by Order No. R-4549 and amended by Orders Nos. R-4549-A and R-4549-B to provide that the maximum daily project allowable will result in average daily reservoir voidage no greater than the reservoir voidage in the project area, as expanded, for calendar year 1972 (56,912 reservoir barrels) or 33,242 barrels of oil per day, whichever is less, except that when injection of 95 percent of all available residue gas is achieved, the project allowance would be an amount of oil no greater than would result in average daily reservoir voidage in the project area, as expanded, for calendar year 1972 (56,912 reservoir barrels) or 41,041 barrels of oil per day, whichever is less.

(5) That to accomplish the aforesaid increase in project base allowable and maximum project allowable, certain modifications to Rule 4 of the project rules would be necessary.

(6) That the proposed expansion of the Empire-Abo Pressure Maintenance Project Area and the concurrent increase in base allowable and maximum project allowable is in the interest of increased recovery of oil and gas, will prevent waste, and will not violate correlative rights, and should be approved.

IT IS THEREFORE ORDERED:

(1) That the project area for the Empire-Abo Pressure Maintenance Project is hereby expanded to include therein:

TOWNSHIP 17 SOUTH, RANGE 28 EAST, NMPM
Section 27: SE/4 SW/4

TOWNSHIP 18 SOUTH, RANGE 28 EAST, NMPM
Section 4: NE/4 NE/4
Section 5: SE/4 NW/4

being 120.03 acres, all in Eddy County, New Mexico.

(2) That Rule 3 of the Special Rules and Regulations for the Empire-Abo Pressure Maintenance Project as promulgated by Order No. R-4549, as amended by Orders Nos. R-4549-A and R-4549-B, is hereby amended to read in its entirety as follows:

"RULE 3. That the maximum daily project allowable shall be an amount of oil which will result in reservoir voidage no greater than the average daily reservoir voidage in the project area for calendar year 1972 (56,912 reservoir barrels) or 33,242 barrels of oil per day, whichever is less, except that when injection of 95 percent of all available residue gas is achieved, the maximum daily project allowable shall be an amount of oil which will result in reservoir voidage no greater than the average daily reservoir voidage in the project area for calendar year 1972 (56,912 reservoir barrels) or 41,041 barrels of oil per day, whichever is less."

(3) That Rule 4 of the Special Rules and Regulations for the Empire-Abo Pressure Maintenance Project is hereby amended to read in its entirety as follows:

"RULE 4. That upon commencement of gas injection and for as long thereafter as such injection continues, extra allowable in addition to the ~~33,000~~ barrels per day described above may be assigned to the project area, provided that such additional allowable shall be based upon the proportion of residue gas available for injection which is actually injected into the unitized formation and shall be computed in accordance with the following formula:

Additional Allowable
in Excess of ~~33,000~~
BOPD 33,242

41.05
= 33.76

$\left[2 \left(\frac{\text{MCF gas inj. previous month} \times 10}{\text{MCF residue gas available prev. month}} \right) \right]^2$

$+ \left(\frac{\text{MCF gas inj. previous month} \times 10}{\text{MCF residue gas available previous month}} \right)$

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That the maximum additional allowable which may be earned by gas injection shall be 7,799 barrels per day. That this maximum may be earned by the injection of 95 percent of the available residue gas into the unitized formation; that gas volumes in excess of said 95 percent which are injected into the unitized formation shall be credited each month to a gas injection bank account which shall be permitted to accrue such gas injection credits up to 100 percent of the average of the total monthly injection volumes for the three previous months, not including the month being reported; that during such times as injection well failures, injection plant shutdowns, and other temporary conditions of unforeseen nature which prevent the injection of at least 95 percent of the available residue gas, said gas injection bank account may be charged a sufficient volume to add to the actual volume of injection achieved to equal 95 percent of the available residue gas for the month. In the event there are insufficient credits accrued to the gas injection bank account to bring actual injection plus applied credits up to 95 percent of available residue gas, production shall be reduced to 33,242 barrels of oil per day plus the amount which the actual injection plus the accrued credits will actually earn. Production beyond this amount shall be considered overproduction and shall be compensated for by underproduction during the following month.

For the purpose of these rules, "Available Residue Gas" shall be defined as being all gas produced from the unitized formation less plant shrinkage, plant fuel, and lease fuel required for operation of the lease.

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Indent [No raw gas nor plant residue gas attributable to the project shall be sold or otherwise disposed of by any means other than injection into the unitized formation except during emergency situations of temporary nature."

(4) That the effective date of this order shall be the effective date of ratification of the unit agreement by the parties concerned.

(5) 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.