

CASE 5577: ATLANTIC RICHFIELD CO.
FOR AMENDMENT OF ORDER NO. R-4549,^{ny}
AS AMENDED, EDDY COUNTY, NEW MEXIC

CASE NO.

5577

APPLICATION,
TRANSCRIPTS,
SMALL EXHIBITS,

ETC.

SUMMARY
CONDITIONS AND TERMS OF AGREEMENT
IMPROVED PRESSURE MAINTENANCE PROJECT
EMPIRE ABO UNIT
EDDY COUNTY, NEW MEXICO

1. Term: For a period as long as Pipeline has gas in the Empire Abo Unit.
2. Delivery and Redelivery Point: Amoco Empire Abo Gasoline Plant, E/2 Section 3-T13S-R27E, Eddy County, New Mexico.
3. Quantity: 25,000 MCFD on a best efforts basis.
4. Quality: Pipeline quality gas with a heating value of not less than 950 BTUs per cubic foot.
5. Priority: The Empire Abo Unit is being operated primarily for the production of oil and the delivery and redelivery of gas hereunder would be subservient to such operations.
6. Facilities: The injection of Pipeline's gas will be accomplished by the three existing 1600 horsepower compressors and related facilities now located near the Empire Abo Gasoline Plant. The Unit would have priority on the use of all unit compressors and unit facilities and would have the right to cease taking Pipeline gas at any time the capacity or facilities are needed by the Unit. In the event additional compressors or facilities are needed for the injection of Pipeline's gas, then Pipeline would have the option to purchase and locate such facilities on the Empire Abo Unit property.
7. Pressure: Suction pressure of the unit injection compressors is estimated to be 700 psig. Pipeline will reimburse the Empire Abo Unit for the estimated incremental operating costs (excluding fuel costs) incurred which are directly related to the compression of Pipeline's gas to inject it into

the Empire Abo Unit. The estimated incremental operating costs would be 1¢ per MCF adjusted upward or downward each year based on the annual hourly earnings for standard industry classification 131.2 crude petroleum and natural gas fields as published by the U. S. Department of Labor, Bureau of Labor Statistics.

8. Redelivery Conditions:

- A. Pipeline would be entitled to redelivery beginning 180 days after the date of first delivery to the Empire Abo Unit.
- B. The Empire Abo Unit would redeliver to Pipeline 88% of the total BTU's delivered by Pipeline to the Unit.
- C. During the period the gas is being injected into the Unit and prior to the termination of the pressure maintenance project, Pipeline shall have the right to take redelivery of its gas for not more than 30 days in any one period consisting of 180 consecutive days.
- D. The rate of redelivery during the pressure maintenance period shall be the lesser of 25,000 MCFD or the available surplus residue gas from the plants which meets the specifications of pipeline quality gas.
- E. The Empire Abo Unit shall deliver to Pipeline at the tailgate of the Amoco Empire Abo Gasoline Plant pipeline quality gas with a heating value of not less than 950 BTU per cubic foot and at a pressure of not less than

700 psig. Pipeline will reimburse the Empire Abo Unit for the operating costs (excluding fuel costs) incurred by the Unit Owners for the boosting, sweetening, and dehydration necessary to redeliver the gas to Pipeline.

F. When injection ceases, Pipeline will no longer have the right to inject outside gas into the Empire Abo Unit; however, Pipeline's right to redelivery shall continue until all gas to which Pipeline is entitled has been redelivered.

G. When injection is discontinued, Pipeline shall take 60% of the surplus residue gas withdrawn from the Empire Abo Unit until all gas which is owned by Pipeline (88% of the total BTU's delivered by Pipeline to the Unit) is recovered or the Empire Abo Unit ceases commercial production.

9. Atlantic Richfield, as operator of the Empire Abo Unit, shall have the duty to act only as a reasonable prudent operator under the same or similar circumstances and shall not be liable for any loss or damage except when such loss or damage is caused by Atlantic Richfield's gross negligence or willful misconduct. Any gas which is lost or which escapes from the formation, any gas lost to non-unit wells, and any gas lost or not available as a result of restrictions of takes pursuant to any regulatory body and will be considered owned by and the loss borne by both parties.

10. In no event will the Empire Abo Unit have an obligation to continue producing or operating the Empire Abo Unit below the normal economic limit in order to redeliver gas to Pipeline.

Atlantic

Richfield Company

North American Producing Division
Permian District
Post Office Box 1610
Midland, Texas 79701
Telephone 915 682 8631



October 22, 1975

United States Department
of the Interior
Geological Survey
P. O. Drawer 1857
Roswell, New Mexico 88201

Attn: Mr. N. O. Frederick (6)
Area Oil and Gas Supervisor

State of New Mexico
Mr. Phil R. Lucero
Commissioner of Public Lands
P. O. Box 1148
Santa Fe, New Mexico 87501

Attn: Mr. Ray D. Graham, Director (3)
Oil and Gas Department

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

Attn: Mr. Joe D. Ramey (3)
Secretary-Director

Working Interest Owners
Empire Abo Unit

BEFORE EXAMINER NUTTER

OIL CONSERVATION COMMISSION

App EXHIBIT NO. 2
CASE NO. 5577

Re: Revised Plan of Operation for
November 1 through December 31, 1975
Empire Abo Unit
Eddy County, New Mexico

Gentlemen:

In compliance with Section 11 of the Unit Agreement,
Empire Abo Unit, Eddy County, New Mexico, Atlantic
Richfield Company, as Unit Operator, on behalf of
itself and the other participating working interest
owners, hereby submits for your approval a Revised
Plan of Operation to cover the period beginning

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of the Interior
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November 1, 1975, and extending through the remainder
of calendar year 1975.

Principal reason for the requested revision is the
proposed Improved Pressure Maintenance Program for
injection of additional gas as discussed in para-
graph 4.f) of the attached Revised Plan.

Very truly yours,

ATLANTIC RICHFIELD COMPANY
OPERATOR

G. V. Ricks
G. V. Ricks

District Production - Drilling
Superintendent

GVR/SHC/hr

Attachments

REVISED PLAN OF OPERATION FOR
NOVEMBER 1 THROUGH DECEMBER 31, 1975
EMPIRE ABO UNIT

Submitted: October 22, 1975

1. Project Area

History and Background

The Empire Abo Unit area consists of some 11,339.15 acres in Eddy County, New Mexico. The area is located in portions of Sections 34, 35, 36, Township 17 South, Range 27, East; Sections 1, 2, 3, 4, 8, 9, 10, 11, 12, 15, 16, 17, Township 18 South, Range 27 East; Sections 25, 26, 27, 28, 31, 32, 33, 34, 35, 36, Township 17 South, Range 28 East; Sections 4, 5, 6, Township 18 South, Range 28 East; Sections 29, 30, Township 17 South Range 29 East. Within the Unit area, the following tracts did not qualify for participation as of the effective date of the Unit (October 1, 1973): 2, 6, 28, 41, 42, 46, 55, 56, 69, 79, 84, 91. These non-participating tracts total 644.74 acres. The remaining 10,694.41 acres are being developed as the project area for pressure maintenance by the injection of plant residue gas from Abo production back into the unitized Abo formation. The Unit, on September 1, 1975, expanded the Project Area by inclusion of tracts 41, 79, and 84. Tracts 2, 6, 42, and 46 have been formed into the CITGO Empire Abo Unit, which received N. M. O. C. C. approval in June 1974, and recently began gas injection.

2. Current Production, Future Recovery

In September 1973, just before Unitization, the pool had 235 producing wells averaging 24,734 BOPD with 9.3% water production and a gas-oil ratio of 1543 cubic feet/BO. The pool total production was equivalent to 67,120 RSVB/D net voidage. The Project Area, in September 1973, had 222 producing wells averaging 23,252 BOPD with 9.8% water production and a gas-oil ratio of 1505 cubic feet/BO. The project area production was equivalent to 61,808 RSVB/D net voidage. In June 1975, the Unitized Project Area averaged 40,559 BOPD with 3.8% water production and a gas-oil ratio of 1205 cubic feet/BO. Gas injection

Revised Plan of Operation for
November 1 through December 31, 1975
Empire Abo Unit
Page 2

averaged 34,377 MCF per day. The project area production for June 1975, was equivalent to 30,531 RSVB/D net voidage. Unit operations have thus increased the project area oil production by 17,307 BOPD and reduced reservoir voidage by 31,277 RSVB/D. Unitized residue gas injection for pressure maintenance is calculated to increase future recovery by about 30 MMBO compared to continued primary operations.

3. Basic Concepts Governing Future Unit Operations

- a) Field production history and reservoir numeric model studies have demonstrated that reservoir recovery is governed by a gravity drainage mechanism with an expanding secondary gas cap. Under unitized operations, Atlantic Richfield Company, as operator, will be able to maximize the beneficial effects of this most efficient recovery mechanism by careful observation of well performance and shutting in or curtailing production from inefficient wells. As of June 1975, the Project Area had 62 former producing wells shut in due to high gas-oil ratio, used for injectors or being otherwise inefficient producers. In addition, 22 other inefficient wells were restricted to very low producing rates.
- b) Injection of gas will act toward pressure maintenance and the orderly control of expansion of the secondary gas cap.

4. Operating Plans, Progress

a) Gas Injection Facilities

At present, the Unit is injecting gas into the Abo Gas Cap in the following eight wells:

Revised Plan of Operation for
November 1 through December 31, 1975
Empire Abo Unit
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<u>Previous Operator/ Lease and Well</u>	<u>Unit Well Designation</u>	<u>Location</u>
Exxon/Chalk Bluff Draw Unit "A" No. 4	M-6	NE/4 NW/4 Sec. 9-T18S-R27E
Amoco/Windfohr Federal No. 4	K-7	NW/4 SE/4 Sec. 4-T18S-R27E
Amoco/MALCO "H" Federal No. 9	I-10	NE/4 NW/4 Sec. 3-T18S-R27E
M. Yates, III Dooley ABO State No. 2	G-19	NW/4 SE/4 Sec. 36-T17S-R27E
Amoco/State "BM" No. 1	G-22	NE/4 SW/4 Sec. 31-T17S-R28E
Amoco/State "BV" No. 1	F-25	SW/4 NW/4 Sec. 32-T17S-R28E
ARCO/M. Yates B (ARC) No. 8	F-31	SW/4 NE/4 Sec. 33-T17S-R28E
Hondo/State "A" No. 21	C-38	NE/4 SW/4 Sec. 26-T17S-R28E

Three additional wells have been approved by the New Mexico Oil Conservation Commission for conversion to gas injection. All three of these wells (Unit F-27, Unit D-37, and Unit H-19) are now injecting gas. The object of these added injection wells is to achieve a better balance of injected gas throughout the gas cap. Construction of gas injection facilities and preparation of injection wells was completed in time to begin injecting gas in June 1974. Beginning in July and continuing through the latest month on which data is available (July 1975), all available plant residue gas has been injected into the Abo gas cap. The Unit picks up plant residue gas at about 700 psi and compresses it to 1900 psi for injection. The gas contains hydrogen sulfide and superdehydration facilities are installed to minimize possible corrosion. A rigorous corrosion checking program

will be maintained. Permits for the Gas Injection Facilities have been granted by the State of New Mexico, Environmental Improvement Agency. Atlantic Richfield Company believes the injection facilities meet the requirements of the United States Geological Survey and the State of New Mexico. In addition, the Injection Facilities provide enough operational flexibility to meet changing field conditions.

b) Oil Production and Test Facilities

Since September 1, 1974, injection of all available residue gas within the project area has earned an allowable of 41,041 BOPD or an increase of 17,789 BOPD over primary operations. In order to effectively and efficiently handle this increased production, work is in progress on enlarging and centralizing oil production and testing facilities. Design criteria for these facilities were outlined in the Plan of Operation for 1974. These have continued to be the guide during final design and construction.

Prior to Unit operations there were approximately fifty (50) batteries within the project area. The design plan which evolved is composed of 14 strategically located production and test station facilities. Exhibit 1, attached to the Plan of Operation for 1974, shows the location of each of the fourteen (14) sites and the wells going into each battery, along with location of gas injection wells, residue gas injection lines, and gas plant locations. Fourteen (14) separate battery and test facility locations will provide enough operational flexibility to hold lost production at an absolute minimum, as a result of equipment failure or a shut-down due to fire or other catastrophe. The nine largest of the new batteries have been completed. They are handling 91% of the Unit production and serve 83% of the producing wells with automatic testing facilities. Wells which will be served by the remaining five batteries continue to produce through their present facilities, while equipment installation goes on. Completion of all oil production and test facilities is now scheduled for the last quarter of 1975.

Revised Plan of Operation for
November 1 through December 31, 1975
Empire Abo Unit
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c) Workovers

A continuous workover study is in progress, so that whenever well production data and reservoir conditions so indicate, workovers are performed to lower gas-oil or water-oil ratios, and maximize producing well efficiency. Three workovers of this type have been performed in 1975 to date.

d) Continuing Field Study

In order to maximize future reserves, Atlantic Richfield Company, as Unit Operator, will continue to maintain a comprehensive production and bottom hole testing program in conjunction with numeric model tests for field performance and predictions.

e) New Producing Well Program

We are moving ahead with the program to drill new producing wells in the most favorable part of the Abo Reef section to gain efficient, low gas-oil ratio production.

Listed below are the new wells completed through September with their allowable oil rate and gas-oil ratio.

<u>Unit Well</u> <u>Designation</u>	<u>Allowable</u> <u>Oil Rate</u> <u>(BOPD)</u>	<u>Gas-Oil Ratio</u> <u>(Cu. ft./BO)</u>
E-371	250	748
E-381	350	581
F-331	450	776
G-311	300	480
H-261	300	675
H-271	300	442
H-291	190	395
J-191	300	605
J-201	250	618
J-211	450	866
L-141	300	802

Locations for the remaining wells have been approved by the N.M.O.C.C. and the wells are in various stages of drilling or completion at the present time. Based on results of this program, further drilling will be considered in the future.

Revised Plan of Operation for
November 1 through December 31, 1975
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f) New Program of Improved Pressure Maintenance

Engineering studies indicate that ultimate oil recovery from the Abo formation can be increased by augmenting the present injection of Abo plant residue gas with additional injection gas from non-Abo sources. As much as 25 MMCF per day of non-Abo gas may be available for injection. The supplier requires the option to take back this non-Abo gas at the same rate it was furnished, for a maximum of 30 days out of any 180-day period. After Unit gas injection is halted, 60% of the Unit share of produced residue gas will be returned to the non-Abo gas supplier until that supplier has recovered 88% of the original BTUs supplied.

Undertaking this project will require the Unit working interest owners to invest considerable money expanding injection compressors, increasing injection line capacity and converting five additional wells to gas injection.

Following are the five wells proposed for conversion to gas injection (see map attached):

<u>Unit Well Designation</u>	<u>Location</u>
C-39	NW/4 SE/4 Sec. 26-T17S-R28E
D-35	SW/4 SE/4 Sec. 27-T17S-R28E
G-24	NE/4 SE/4 Sec. 31-T17S-R28E
H-21	SW/4 SW/4 Sec. 31-T17S-R28E
I-18	NE/4 NW/4 Sec. 1-T18S-R27E

g) Modifications

It is understood that to meet changing conditions, this plan of operation may be modified from time to time, with the approval of the Supervisor, the Commissioner of Public Lands of the State of New Mexico, and the New Mexico Oil Conservation Commission.

Atlantic Richfield Company, as Unit Operator will act

Revised Plan of Operation for
November 1 through December 31, 1975
Empire Abo Unit
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prudently to preserve all rights of the mineral owners,
and to effectively and efficiently recover the Unit area
reserves. This Company will meet all economical offset
obligations, act to prevent waste, conserve natural
resources, and protect correlative rights.

6. Effective Date

This Plan of Operations shall be effective November 1,
1975, and extend through the calendar year unless other-
wise amended.

If this plan of Operation meets with your approval,
please indicate in the space below and return one copy
for our files.

Very truly yours,

ATLANTIC RICHFIELD COMPANY
OPERATOR

G. V. Ricks

G. V. Ricks
District Production - Drilling
Superintendent

GVR/SHC/hr

APPROVED BY: _____ DATE: _____
Supervisor of United States
Geological Survey

APPROVED BY: _____ DATE: _____
Commissioner of Public Lands
State of New Mexico

APPROVED BY: _____ DATE: _____
Secretary-Director
New Mexico Oil Conservation
Commission

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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
October 22, 1975

EXAMINER HEARING

IN THE MATTER OF:

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

CASE
5577

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:

Thomas Derryberry, Esq.
Legal Counsel for the Commission
State Land Office Building
Santa Fe, New Mexico

For the Applicant:

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

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I N D E X

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GORDON SOMMERS

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EXHIBIT INDEX

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Arco Exhibit No. One, Map	10
Arco Exhibit No. Two, Rev. Plan of Operation	10
Arco Exhibit No. Three, Gas Bank Statement	10

1 MR. NUTTER: The Hearing will come to order.
2 We will call the next Case, Number 5577.

3 MR. DERRYBERRY: Case 5577, application of Atlantic
4 Richfield Company for amendment of Order No. R-4549, as
5 amended, Eddy County, New Mexico.

6 MR. HINKLE: Clarence Hinkle, Hinkle, Bondurant,
7 Cox and Eaton appearing on behalf of Atlantic Richfield and
8 we have one witness and three exhibits.

9 (THEREUPON, the witness was duly sworn.)

10 GORDON SOMMERS

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

13
14 DIRECT EXAMINATION

15 BY MR. HINKLE:

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

18 A My name is Gordon Sommers, I reside in Midland,
19 Texas and I'm employed by Atlantic Richfield Company as a
20 petroleum engineer.

21 Q Have you previously testified before the Commission?

22 A No, I have not.

23 Q State briefly your educational background and
24 experience as a petroleum engineer?

25 A I graduated from Texas A and M University with

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1 a Bachelor of Science degree in mechanical engineering and
2 a Master of Science degree in petroleum engineering in
3 August of 1970. I was employed by Atlantic Richfield Company
4 in Corpus Christi, Texas and was associated with various
5 Gulf coast fields and reservoirs for a period of approximately
6 fifteen months. I was then transferred to Midland, Texas in
7 November of '71 and I was involved in the pre-unitization
8 efforts of the Empire Abo Pool. Since unitization of the
9 field in October of '73 I have been and am now actively
10 involved in reservoir surveillance and continuing field and
11 reservoir engineering studies of the Empire Abo Unit.

12 MR. HINKLE: Are the qualifications of the
13 witness acceptable?

14 MR. NUTTER: Yes, they are.

15 Q (Mr. Hinkle continuing.) Are you familiar with
16 the application of Atlantic Richfield in this Case?

17 A. Yes, I am.

18 Q What is Atlantic Richfield seeking to accomplish?

19 A. Atlantic Richfield Company is operator of the
20 Empire-Abo Unit and wishes to inject an additional twenty-
21 five million cubic feet per day of non-Abo gas into the
22 Abo gas cap to better maintain reservoir pressure and recover
23 additional oil over and above that which will be recovered
24 from the present injection of all available Abo residue gas.
25 The supply of this gas is requested, the right to take

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1 redelivery of a portion of this supplied gas at a rate not to
2 exceed its daily average reservoir -- average daily delivery
3 rate, for not more than thirty days in any one one hundred
4 and eighty day period. Put on an annual basis, the suppliers
5 wish to take back one sixth of what they give us to meet
6 peaks, swings and temporary interruptions.

7 We further request amendment of Order R-4549-B so
8 as to set up a separate gas bank covering honorable gas
9 input and withdrawal so that a proper rate count be kept
10 separately from the gas bank already set up for all available
11 Abo residue gas injected.

12 We wish to implement this improved pressure
13 maintenance project as soon as possible and ask for an
14 effective date of the revised plan of operation of November 1st,
15 1975.

16 Q Have you prepared or has there been prepared
17 under your supervision exhibits for introduction in this
18 case?

19 A Yes, sir.

20 Q They are the ones that have been marked One, Two
21 and Three?

22 A That is correct.

23 Q Refer to Exhibit One and explain what this is and
24 what it shows?

25 A Exhibit One is a map of the Empire-Abo Pool. We

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1 have shown all leases deemed to be productive in the Pool.

2 Tracts that are shaded orange are leases in the
3 Pool which elected not to participate in the Atlantic
4 Richfield Company Empire-Abo Unit. We also have shown by a
5 blue triangle designation, those wells which we have injected
6 gas into to this date.

7 Q I was going to ask you what is shown by the red
8 triangle?

9 A Right. Injection of an additional twenty-five to
10 thirty million cubic feet per day will necessitate the con-
11 version of five additional wells to gas injection service.
12 These five wells are designated by red triangles and have been
13 approved for gas injection by the Commission administratively.
14 These wells will be converted to gas injection service as soon
15 as we obtain approval from the State.

16 Q Now refer to Exhibit Two and explain what this is?

17 A Exhibit Two is a copy of the revised plan of
18 operations. The principal reason for the revised plan of
19 operation in 1975 is for the implementation of the improved
20 pressure maintenance project by the injection of non-Abo gas.
21 This perform and content of this revised plan of operations
22 is similar to that that was approved by the Commission for
23 the calendar year of '75, and in paragraph four(f), (Reading.)
24 other revised plan of operations that we are submitting
25 concerns itself with an improved pressure maintenance project

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1 and the injection of non-Abo gas. (End of reading.)

2 In summary, paragraph four (f) of the revised plan of
3 operation states that engineering studies, both previous and
4 current show that an additional amount of oil will be recovered
5 from the reservoir by augmenting our present injection of
6 Abo plant gas with an additional injection of gas from non-Abo
7 sources. The suppliers indicate that as much as twenty-five
8 million cubic feet per day will be available for injection.
9 The suppliers of the non-Abo gas, as previously stated,
10 require the option to take back a portion of this gas at the
11 same rate it was furnished to the unit for a maximum of
12 thirty days out of every one hundred and eighty days. After
13 unit gas injection is halted sixty percent of the unit's share
14 of produced residue gas will be returned to the non-Abo gas
15 supplier until the supplier has recovered eighty-eight
16 percent of the original BTU supplied to the unit.

17 Q Does this also give the location of the new injection
18 well?

19 A Yes, it does.

20 Q Has this modified plan of operation been approved
21 by the USGS?

22 A We have been advised by the USGS Monday, October 20th,
23 that a copy of the approved revised plan of operation and
24 a transmittal letter had been sent to us in the mail. As of
25 this date we haven't received it. It is probably in our

1 offices now.

2 Q What about approval by the Commissioner of Public
3 Lands?

4 A This program was reviewed with the Commissioner,
5 with a representative of the Commissioner of New Mexico Public
6 Lands. They took it under advisement. At the time they
7 seemed receptive to the whole proposal and didn't have
8 anything against it.

9 Q The Commissioner is waiting the approval by the
10 Commission before his approval of the plan?

11 A That is my understanding.

12 Q Now refer to Exhibit Three and explain this?

13 A Exhibit Three is a copy of the gas bank statement
14 as previously submitted to the Commission to account for the
15 five percent credit derived to the Unit by the injection of
16 all available residue gas in any one month period. We wish
17 to supplement this gas bank by the inclusion of page three.
18 Page three is a rather simple method of accounting for the
19 non-Abo gas injected into the Abo gas cap. We plan to account
20 for this on a monthly basis as we account for the injection
21 of all Abo gas on a monthly basis. The columns we have set
22 up will represent gas injected, accumulative gas injected,
23 gas delivered back to the suppliers or the withdrawals,
24 accumulative withdrawals, and the gas in the Abo gas cap.
25 Page three concerns itself with strictly non-Abo gas as

1 differentiated from pages one or two, which is the calculation
2 of the monthly gas bank.

3 Q Will these monthly reports be furnished to the
4 Commission?

5 A Yes, they will.

6 Q What will be the benefits of the revised project, in
7 your opinion?

8 A Engineering studies, both previously and present,
9 show an added oil recovery of about two point eight million
10 barrels of oil implementation of the proposed improved pressure
11 maintenance project. Now this is in addition to what would
12 be recovered by continuation of the present program of
13 injecting all available residue Abo gas. In other words,
14 this two point eight million barrels of oil will not be
15 recovered unless we implement the improved pressure maintenance
16 project.

17 Q It will be additional recovery?

18 A Yes, sir.

19 Q Are there any provisions of the unit agreement that
20 provides for this or that might conflict with the injection
21 of extraneous gas?

22 A Yes, Section 16 of the Empire-Abo Unit agreement
23 (5) provides for the injection of non-Abo gas and/or non-
24 unitized substances.

25 Q In your opinion do you feel that this optimizes

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1 the New Mexico natural resources for use in New Mexico?

2 A. Yes, I do.

3 Q. Do you feel that this improved pressure maintenance
4 project is in the interest of conservation and the prevention
5 of waste and will protect correlative rights?

6 A. I do.

7 Q. Do you have any further comments with respect to
8 these exhibits?

9 A. No, I do not.

10 MR. HINKLE: We would like to offer Exhibits One,
11 Two and Three.

12 MR. NUTTER: Arco Exhibits One through Three will
13 be admitted into evidence.

14 Are you through, Mr. Hinkle?

15 MR. HINKLE: Yes.

16

17 CROSS EXAMINATION

18 BY MR. NUTTER:

19 Q. Mr. Sommers, page three of your gas bank statement
20 doesn't make any provisions for debiting the gas bank, it is
21 not your intent to use this gas that goes into the reservoir
22 as a debit in the calculation of increased allowables under
23 Rule 4 of the Order?

24 A. No, sir.

25 Q. In other words, this is just an accounting sheet

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1 to show how much gas has been put in the reservoir?

2 A. Yes, sir.

3 Q How would you suggest that we do, just insert a
4 Rule 4-A in our Empire-Abo rules authorizing the establishment
5 of a gas bank for non-Abo gas and a simple accounting of it?

6 A. Yes, sir, that would be my recommendation.

7 MR. NUTTER: Is there anything further of Mr.
8 Sommers?

9 MR. HINKLE: That's all I have.

10 MR. NUTTER: He may be excused.

11 (THEREUPON, the witness was excused.)

12 MR. NUTTER: Anything further, Mr. Hinkle?

13 MR. HINKLE: That's all.

14 MR. NUTTER: Does anyone have anything they wish
15 to offer in Case 5577?

16 We will take the Case under advisement and the
17 Hearing is adjourned.

18

19

20

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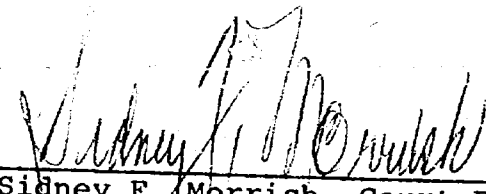
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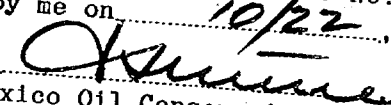
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REPORTER'S CERTIFICATE

I, SIDNEY F. MORRISH, a 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.


 Sidney F. Morrish, Court Reporter

I do hereby certify that the foregoing is
 a complete record of the proceedings in
 the Examiner hearing of Case No. 5575, 5577
 heard by me on 10/22, 19 75.

 Examiner
 New Mexico Oil Conservation Commission

sid morrish reporting service
 General Court Reporting Service
 825 Calle Mejia, No. 122, Santa Fe, New Mexico 87501
 Phone (505) 982-9212

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. 5577
Order No. R-4549-D

APPLICATION OF ATLANTIC RICHFIELD
COMPANY FOR AMENDMENT OF ORDER NO.
R-4549, AS AMENDED, EDDY COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on October 22, 1975, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 17th day of November, 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 pursuant to Commission Order No. R-4549, dated June 15, 1973, as amended by Orders Nos. R-4549-A, R-4549-B, and R-4549-C, dated January 15, 1974, April 30, 1974, and July 1, 1975, respectively, the applicant Atlantic Richfield Company is conducting pressure maintenance operations in the Empire Abo Unit Area, Empire-Abo Pool, Eddy County, New Mexico.

(3) That said pressure maintenance operations include the reinjection of casinghead gas produced from said Empire-Abo Pool back into the reservoir from which it came.

(4) That even with the reinjection of all available casinghead gas produced from said pool, there still remains considerable reservoir voidage resulting from the production of liquid hydrocarbons from the reservoir.

(5) That the applicant seeks to minimize this reservoir voidage by the injection into the Abo formation of extraneous gas brought in from other sources.

-2-

Case No. 5577

Order No. R-4549-D

(6) That the injection of from 25 million to 35 million cubic feet of extraneous gas per day into the Abo formation will virtually eliminate the net voidage of the reservoir underlying the Empire Abo Unit Area, will result in the recovery of additional oil, thereby enhancing the recovery of oil from the reservoir and otherwise prevent waste, will not impair correlative rights, and should be approved.

IT IS THEREFORE ORDERED:

(1) That the Special Rules and Regulations for the Empire-Abo Pressure Maintenance Project, as promulgated by Commission Order No. R-4549, and as amended by Commission Order Nos. R-4549-A, R-4549-B, and R-4549-C, are hereby further amended by the addition of the following Rule 4(A):

"RULE 4(A).

That in addition to the injection of available residue gas and the establishment of an available residue gas injection bank as described in Rules 3 and 4 above, the project operator may inject up to and including 35 million cubic feet of extraneous gas per day into the Abo formation underlying the project area; further, that withdrawals of said extraneous gas may be made, but pending reservoir blow-down, during not more than 30 days in any one 180-day period; provided however, that pending blow-down, the daily rate of withdrawal shall not exceed the average daily rate of injection of such extraneous gas during the preceding 180-day period; provided further, that the project operator shall establish and maintain an "Extraneous Gas Bank Statement" which shall be filed with the Commission each month concurrently with the project operator's "Empire-Abo Pressure Maintenance Project Monthly Report" and "Abo Gas Bank Statement", and which shall show thereon each month the volume of extraneous gas injected, the cumulative volume of such gas injected, the volume of gas delivered back to the supplier of extraneous gas, the cumulative volume of gas delivered back to the supplier, and the net cumulative extraneous gas bank."

(2) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

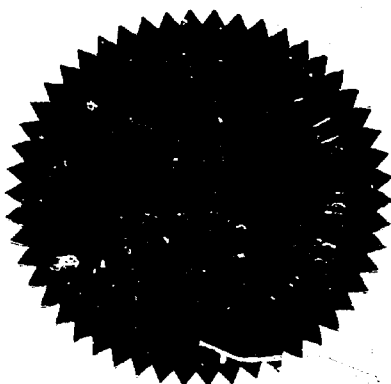
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Case No. 5577

Order No. R-4549-D

DONE at Santa Fe, New Mexico, on the day and year herein-
above designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION


Phil R. Lucero
PHIL R. LUCERO, Chairman

Emery C. Arnold
EMERY C. ARNOLD, Member

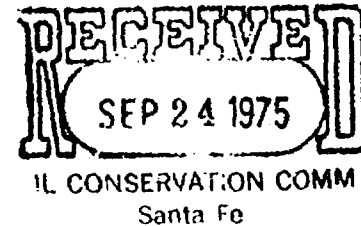
Joe D. Ramey
JOE D. RAMEY, Member & Secretary

S E A L

dr/

Case 5577

BEFORE THE OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO



APPLICATION OF ATLANTIC RICHFIELD COMPANY,
UNIT OPERATOR OF THE EMPIRE ABO UNIT EM-
BRACING LANDS IN TOWNSHIPS 17 AND 18 SOUTH,
RANGES 27, 28 AND 29 EAST, EDDY COUNTY TO
INSTITUTE AN IMPROVED PRESSURE MAINTENANCE
PROJECT BY AUGMENTING CURRENT GAS INJECTION
WITH ADDITIONAL NON-ABO GAS. APPLICANT ALSO
SEEKS TO ESTABLISH A SEPARATE NON-ABO GAS
BANK FOR THE EMPIRE ABO PRESSURE MAINTENANCE
PROJECT AS APPROVED BY ORDER R-4549 AND
AMENDED BY ORDERS R-4549A, R-4549B and R-4549C.

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

Comes Atlantic Richfield Company, Unit Operator of the Empire Abo Unit, acting by and through the undersigned attorneys and hereby makes application to institute an improved pressure maintenance project by augmenting current gas injection with additional non-Abo gas. Applicant also seeks to establish a separate non-Abo gas bank for the Empire Abo Pressure Maintenance Project as approved by Order R-4549 and amended by Orders R-4549A, R-4549B and R-4549C, and in support thereof respectfully shows:

1. The Oil Conservation Commission 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, Order R-4549B, dated April 30, 1974 and Order R-4549C, dated July 1, 1975.
2. That in Case No. 5505, pursuant to which Order No. R-4549C was issued there are on file plats showing the boundaries of the unit area and showing those tracts within the unit area committed to the pressure maintenance project.
3. That applicant has developed and has available a supply of non-Abo gas for injection into the Abo gas cap.
4. That such supplemental gas injection will better maintain reservoir pressure and will result in recovery of additional oil over and above that which is anticipated from the present injection of all available Abo residue gas.

Case 5577

5. That the supplier of the non-Abo gas has requested the right to take redelivery of a portion of the gas it has supplied, at a rate not to exceed the daily delivery rate, for not more than 30 days in any one 180 day period.

6. Applicant desires that the right to inject non-Abo gas in connection with the pressure maintenance project be made effective at the earliest possible time.

7. Applicant requests that Order R-4549B be amended so as to set up a separate gas bank covering only non-Abo gas input and withdrawal, so that proper account can be kept separately from the gas bank already set up for available residue gas.

8. In the opinion of applicant, said improved pressure maintenance project by injection of non-Abo gas and separate gas bank provisions as outlined in this application 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 October 22, 1975.

Respectfully submitted,

ATLANTIC RICHFIELD COMPANY

By


HINKLE, BONDURANT, COX & EATON

Attorneys for Applicant

P.O. Box 10

Roswell, New Mexico 88201

DOCKET MAILED

Date 10/14/75

AGREEMENT

THIS AGREEMENT is made this _____ day of _____, 1975, by and between Southern Union Gas Company, a Delaware corporation, whose address is Fidelity Union Tower Building, Dallas, Texas 75201, Llano, Incorporated, a New Mexico corporation, whose address is P. O. Drawer 1320, Hobbs, New Mexico 88240, TUCO, Inc., a New Mexico corporation, whose address is P. O. Box 1261, Amarillo, Texas 75170, hereinafter referred to as "Pipeline," and Atlantic Richfield Company, a Pennsylvania corporation, whose address is P. O. Box 2819, Dallas, Texas 75221, hereinafter referred to as "Atlantic Richfield," acting as operator of the Empire Abo Unit.

WHEREAS, the Empire Abo Unit, located in Eddy County, New Mexico, has been formed and the current plan of operation under the Unit Agreement provides for gas injection for pressure maintenance purposes, and

WHEREAS, Atlantic Richfield has determined that it can use, in addition to the residue gas available from unit production, an additional amount of gas for injection in the Unit which is estimated to be 25,000 MCFGPD, and

WHEREAS, Pipeline may have or may cause to be available an estimated 25,000 MCFGPD which it is willing to deliver to Atlantic Richfield for injection in the Empire Abo Unit, and

WHEREAS, Pipeline, acting as agent for certain other Parties which Pipeline has contractual arrangements with, desires to furnish its gas for use in the Empire Abo Gas Pressure Maintenance until said gas is needed elsewhere.

IT IS NOW THEREFORE AGREED:

ARTICLE I

DEFINITIONS

1.1 Empire Abo Unit shall mean the area generally outlined in Exhibit "A" hereto and effectively committed to the Unit Agreement and Unit Operating

Agreement dated October 1, 1972, which became effective October 1, 1973, whether committed prior or subsequent to October 1, 1973.

1.2 "MCF" shall mean one thousand (1,000) cubic feet at a temperature of sixty degrees (60°) Fahrenheit and an absolute pressure of fourteen and sixty-five one hundredths (14.65) pounds per square inch measured and computed in accordance with Articles IV, V and VI hereof.

1.3 "BTU" shall mean British Thermal Unit.

1.4 Pipeline Quality Gas shall mean gas which conforms to the following specifications:

- A. Liquids: The gas shall be essentially free of liquid hydrocarbons and contain no more than seven (7) pounds of water vapor per million cubic feet of gas.
- B. Hydrogen Sulfide: The gas shall contain no more than 0.25 of one (1) grain of hydrogen sulfide per one hundred (100) cubic feet.
- C. Sulfur: The gas shall contain no more than five (5) grains of total sulfur per one hundred (100) cubic feet and no more than two (2) grains of mercaptans per one hundred (100) cubic feet.
- D. Dust, Gums: The gas shall be commercially free from all dust, gums and other solid matter.
- E. Heating Value: The gas shall have a minimum gross heating value of 950 BTU per cubic foot.
- F. Temperature: The gas shall be delivered at temperatures not in excess of 120 degrees Fahrenheit and not less than 50 degrees Fahrenheit.
- G. Carbon Dioxide: The gas shall contain not more than three percent (3%) by volume of carbon dioxide.
- H. Oxygen: The gas shall contain not more than one percent (1%) by volume of oxygen.

1.5 Surplus Residue Gas shall mean the residue gas attributable to the Empire Abo Unit gas processed in the Plants which is in excess of the varying quantities used or required for the operation and development (including injection gas) of the leases within the Empire Abo Unit.

1.6 Plants shall mean all presently existing Plants processing gas from the Empire Abo Unit.

ARTICLE II

DURATION OF AGREEMENT

2.1 The effective date of this Agreement shall be _____ 1975, and shall be for a term for as long as Pipeline has gas in the Empire Abo Unit under the terms of this Agreement.

ARTICLE III

DELIVERY AND REDELIVERY

3.1 Pipeline agrees to deliver, on a best effort basis, to a delivery point in the vicinity of the Hondo Oil & Gas - Amoco Empire Abo Gasoline Plant, located in the East half (E/2) of Section Three (3), Township Eighteen South (T18S), Range Twenty-Seven East (R27E), Eddy County, New Mexico, up to 25,000 MCFGPD of Pipeline Quality Gas which shall not have a heating value less than nine hundred fifty (950) BTU's per cubic foot, it being understood and agreed that Pipeline is not required to deliver any particular volume of gas for injection hereunder. This will also be the point of redelivery.

3.2 The Empire Abo Unit is being operated primarily for the production of oil and the delivery and redelivery of gas under this Agreement shall be subservient to said operations. It is assumed by the Parties that the injection of Pipeline's gas will be accomplished by the three existing sixteen hundred (1600) horsepower compressors and related facilities now on location near the Empire Abo Gasoline Plant. It is expressly understood that the Unit has priority on the use of all unit compressors and facilities and has the right to cease taking Pipeline's gas upon notice to Pipeline at any time the capacity is needed by the Unit. In the event additional compressors or facilities are needed for the injection of Pipeline's gas, then Pipeline may purchase same at its sole cost and expense to be located on Atlantic Richfield's property.

3.3 Pipeline will deliver its gas at the suction pressure of the unit injection compressors which is estimated to be seven hundred (700) psig maximum at the point of delivery and will reimburse Atlantic Richfield for the estimated incremental operating costs (excluding fuel costs) incurred by Atlantic Richfield which are directly related to the additional compression of said gas necessary to inject it into the Empire Abo Unit. Estimated incremental operating costs shall be one cent (1¢) per MCF adjusted upward or downward on January 1, 1976, by multiplying it by a fraction, the denominator of which is the Annual Hourly Earnings for Standard Industry Classification 131.2 Crude Petroleum and Natural Gas Fields as published by the U.S. Department of Labor - Bureau of Labor Statistics or its successor index for the month of December, 1974, and the numerator of which is the Average Hourly Earnings for such classification for December, 1975. The base charge will be adjusted in a similar manner on each January 1 thereafter, using as the denominator of the adjustment fraction the Average Hourly Earnings figure for December, 1974, and as the numerator the Average Hourly Earnings figure for the immediately preceding December.

3.4 Pipeline's delivery of gas under the terms hereof shall not under any circumstances be construed to be a sale or transfer of title of said gas to Atlantic Richfield.

3.5 Atlantic Richfield shall redeliver to Pipeline the gas delivered by Pipeline under the terms of this Agreement pursuant to the following terms and conditions:

- A. Pipeline shall be entitled to redelivery of its gas beginning one hundred and eighty (180) days after the date of first delivery by Pipeline to Atlantic Richfield under the terms hereof.
- B. Atlantic Richfield shall redeliver to Pipeline an equal number of BTU's delivered by Pipeline to Atlantic Richfield subject, however, to reduction as further provided in this Article III, Paragraph 3.5.
- C. Pipeline, during the period that gas is being injected into the Unit and prior to termination of the pressure maintenance project, shall have the right to take

redelivery of its gas hereunder for only thirty (30) days in any one period consisting of one hundred and eighty (180) consecutive days.

- D. The rate at which Pipeline is entitled to redelivery during the period specified in C. above shall be the lessor of 25,000 MCFGPD or the available Surplus Residue Gas from the Plants which meets the specifications of Pipeline Quality Gas.
- E. Atlantic Richfield shall begin to redeliver to Pipeline its gas hereunder upon three (3) hours notice by Pipeline unless in the sole judgment of Atlantic Richfield said redelivery will have an adverse effect on allowables or a detrimental effect on the operation of the Unit. Except in cases of Force Majeure, Atlantic Richfield will on a best efforts basis give Pipeline twenty-four (24) hours, but not less than three (3) hours notice of its intention to cease in part or whole either accepting gas from Pipeline for injection or redelivering gas to Pipeline. Notices contemplated in this Paragraph may be given as provided in Article XII, Paragraph 12.1, or notices may be given by any means of communication to such Party as the Parties may designate. All notices shall be confirmed in writing.
- F. Atlantic Richfield shall redeliver to Pipeline at the tailgate of Hondo - Amoco Empire Abo Gasoline Plant Pipeline Quality Gas with a heating value of not less than nine hundred and fifty (950) BTU's per cubic foot at a pressure not less than seven hundred (700) psig. Provided, however, that Pipeline will reimburse Atlantic Richfield for the operating costs (excluding fuel costs) incurred by the Unit Owners for the boosting, sweetening and dehydration necessary to redeliver the gas to Pipeline. This operating cost shall be the same cost that the Amoco operated Empire Abo Gasoline Plant charges the producers of casinghead gas for this service as provided for in the attached Exhibit "B".
- G. Pipeline's right to redelivery shall continue until all gas (BTU's) to which Pipeline is entitled has been redelivered.
- H. At the time injection is discontinued, which is estimated to be ten (10) years, Pipeline shall be entitled to receive volumes of gas on any day up to sixty percent (60%) of the Surplus Residue Gas withdrawn from the Empire Abo Unit until all gas (BTU's) which is owned by Pipeline is recovered or the Empire Abo Unit ceases commercial production. If any conflict arises between the provisions of this Paragraph H. and the Plan of Operation approved by USGS and the Commissioner of Public Land of the State of New Mexico, as provided for in Section 16 of the Unit Agreement for Empire Abo Unit or as otherwise may be

required by law or regulation, the requirements of said Plan of Operation or applicable law or regulation shall prevail. Nothing herein, however, shall entitle Pipeline to receive more than the actual amount of BTU owned by Pipeline in the Unit adjusted for BTU as determined in I. below.

- I. BTU which is owned by Pipeline, expressed in MMBTU's, shall be eighty-eight percent (88%) of the BTU's delivered by Pipeline for injection into the Unit.
- J. From the time of delivery by Pipeline to Atlantic Richfield until redelivery back to Pipeline, Atlantic Richfield shall have custody and control of and be responsible for the handling of Pipeline's gas. However, in the handling of such gas, Atlantic Richfield shall have the duty to act only as a reasonably prudent operator under the same or similar circumstances and shall not be liable for any loss or damage except such loss or damage as is caused by Atlantic Richfield's gross negligence or willful misconduct and it is further agreed that any gas which is lost or which escapes from the formation, any gas lost to non-Unit wells, any gas lost or not available as a result of restriction of takes pursuant to Paragraph H. above and any gas lost or not available from any Plant not presently existing which processes casinghead gas from the Unit shall be deemed beyond the custody and control of Atlantic Richfield and will be considered owned by and the loss borne by both Parties.
- K. However, in no event shall Atlantic Richfield have an obligation to produce or operate the Empire Abo Unit below a normal economic limit in order to redeliver gas to Pipeline. When Atlantic Richfield, acting as Unit Operator, has deemed the operation of the Empire Abo Unit has become uneconomical, Atlantic Richfield and Pipeline will put forth at this time a best effort in an attempt to secure either through lease or purchase the equipment, well bores, pipelines, etc., necessary for the continued operation of the Empire Abo Field by Pipeline. The operation of this equipment by Pipeline will only be necessary in the recovery of natural gas not yet returned to Pipeline as set forth in Paragraph H. above.

3.6 Atlantic Richfield agrees to furnish to Pipeline such non-interpretative geological, engineering, and production data available to Atlantic Richfield without cost to Pipeline, as may be needed for a determination of gas reserves of the Unitized Formation. Such information shall be furnished upon request of Pipeline at intervals not less than two (2) years.

ARTICLE IV

METERING

4.1 Pipeline, at its sole cost, risk and expense, shall install, maintain and operate at the points of delivery and redelivery hereunder standard type orifice meters or other types of meters which are mutually acceptable for measuring the volume of gas delivered and redelivered at the points of delivery and redelivery and Pipeline shall cause said meters to be read at such daily or weekly intervals as Pipeline may elect. The orifice meters and other facilities so installed at the points of delivery and redelivery shall be constructed and installed in accordance with the specifications prescribed in Report No. 3 of the Gas Measurement Committee of the American Gas Association dated September, 1969, and revisions thereto. Gas volumes, when measured by positive displacement, rotary turbine or other non-orifice type meter(s), shall be computed in accordance with the recommendations of the manufacturer of the meter(s) and accepted practices of the natural gas industry.

4.2 Said meters and all meter readings and meter charts shall be accessible at all reasonable times to inspection and examination by Atlantic Richfield, but the calibration and adjustment of Pipeline's meters shall be done by Pipeline.

4.3 Said meters shall be calibrated at least once each thirty (30) days by and at the expense of Pipeline. Pipeline shall give Atlantic Richfield's designated representative notice of each such calibration test in sufficient time to enable Atlantic Richfield to have its representative present. If upon any such test the measuring equipment is found to be equal to or less than two percent (2%) erroneous in the aggregate, previous readings of such equipment shall be considered correct in computing the deliveries and redeliveries of gas hereunder, but such equipment shall be adjusted at once to read accurately.

If upon any test the measuring equipment shall be found to be inaccurate in the aggregate by an amount exceeding two percent (2%) at a reading corresponding to the average rate of flow for the period since the last preceding test, then any previous reading of such equipment shall be corrected to zero error for any period which is known definitely or agreed upon, but in case the period is not known definitely or agreed upon, then for a period extending back one-half ($\frac{1}{2}$) of the time elapsed since the date of the last test. If for any reason any of the measuring equipment is out of service or out of repair, so that the volume of gas delivered or redelivered cannot be ascertained or computed from the reading thereof, the volume of gas delivered or redelivered during the period such equipment is out of repair shall be estimated and agreed upon by the Parties hereto on the basis of the best data available, using the first of the following methods which is feasible:

- A. By using the registration of Atlantic Richfield's check meter, if installed and accurately registering;
- B. By correcting the error in Pipeline's meter, if the percentage of error is ascertainable by calibration, test or mathematical calculation;
- C. By estimating the volume of delivery or redelivery by using as a basis the volumes delivered or redelivered during preceding periods under the similar conditions when the meter was registering accurately.

4.4 Atlantic Richfield may install, maintain and operate such check measuring equipment as it desires, provided that such check meters and equipment shall be so installed as not to interfere with the operation of the meters to be installed and maintained by Pipeline at or near the point of delivery and redelivery hereunder as provided in Paragraph 4.3.

ARTICLE V

UNITS OF VOLUME

5.1 The unit of volume for all purposes hereunder (except for determination of heating value) shall be one (1) cubic foot at an absolute

pressure of fourteen and sixty-five one hundredths (14.65) pounds per square inch at a temperature of sixty degrees (60°) Fahrenheit.

5.2 The unit of volume for the determination of heating value for purposes of Article VI hereof shall be the amount of gas, saturated with water vapor, which would occupy a volume of one (1) cubic foot at a temperature of sixty degrees (60°) Fahrenheit and under a pressure equivalent to thirty (30) inches of mercury at thirty-two degrees (32°) Fahrenheit. Heating value(s) thus determined shall be corrected and expressed as total calorific value(s), dry basis, at an absolute pressure of 14.65 pounds per square inch and temperature of sixty degrees (60°) Fahrenheit.

ARTICLE VI

MEASUREMENT

6.1 All measurement of gas by orifice meter hereunder shall be in accordance with the recommendations for measuring gas contained in Report No. 3 of the Gas Measurement Committee of the American Gas Association, dated September, 1969, including the revisions thereto, applied in an appropriate manner, and correction shall be made for deviation from the Ideal Gas Laws. For measurement purposes hereunder an assumed atmospheric pressure of thirteen and one tenth (13.1) pounds per square inch absolute shall be utilized irrespective of any variation of the actual barometric pressure from such assumed pressure.

6.2 The temperature of the gas flowing through the meter or meters shall be determined by the use of a recording thermometer of standard manufacture, installed, maintained and operated by Pipeline at its sole cost, risk and expense so that it may properly record the temperature of the gas flowing through Pipeline's meter or meters at the points of delivery and redelivery. The arithmetical average of the twenty-four (24) hour record, or of that portion of the twenty-four (24) hours during which gas was passing if gas

had not been passing during the entire period, from the recording thermometer shall be taken to be the gas temperature for the day and shall be used to make proper corrections in volume computations.

6.3 The specific gravity of the gas delivered or redelivered hereunder shall be determined: (i) by spot tests with an instrument of standard manufacture acceptable to the Parties at least quarterly, or more frequently if found necessary in practice to insure accurate measurement, or (ii) at Pipeline's option by a recording gravitometer. Each spot test shall determine the specific gravity to be used in computation for the measurement of natural gas delivered or redelivered until the next succeeding test.

6.4 The gross heating value of the gas as determined for purposes hereunder shall be determined by Pipeline by means of a recording calorimeter installed by Pipeline.

6.5 Pipeline or its designated representative shall conduct the tests and determinations under this Article VI which are to be made with equipment owned or to be furnished by Pipeline, but Pipeline, prior to making such test or determination, shall give Atlantic Richfield or its designated representative notice of each such test or determination in sufficient time to enable Atlantic Richfield to have their representative present.

ARTICLE VII

BILLING, ACCOUNTING AND REPORTS

7.1 All charges contemplated under this Agreement, except those in bona fide dispute, shall become due and payable by the fifteenth (15th) day of the month following the month of the billing by either Party. Examination of the books of account kept by either Party respecting this Agreement shall be permitted by either Party at any and all reasonable hours. All statements, billings, and payments shall be subject to correction of any errors contained therein until the expiration of one (1) year after rendition.

7.2 When requested to do so by Atlantic Richfield, Pipeline shall mail all charts or microfilm copies thereof to Atlantic Richfield or its designated representative for checking as soon as is conveniently possible after computing the volumes therefrom after which such charts or microfilm copies thereof shall be returned to Pipeline within forty-five (45) days of receipt by Atlantic Richfield and kept on file by Pipeline for the mutual use of both Parties for a period of at least one (1) year.

ARTICLE VIII

WARRANTY OF TITLE AND INDEMNIFICATION

8.1 Pipeline hereby warrants the title to all gas which it will deliver under the terms hereof and further warrants that all taxes and royalty have been paid or provided for prior to delivery and Atlantic Richfield warrants that the gas redelivered to Pipeline under the terms hereof shall be free of all encumbrances including without limitation any taxes or royalty payments. Each Party agrees to indemnify the other Party against all suits, actions, debts, accounts, damages, costs, losses, and expenses arising from or out of any adverse legal claims or any and all persons to or against the warranties stated herein.

8.2 Atlantic Richfield shall install and maintain in good condition at all times and its own expense all facilities between the point of delivery and the point of redelivery. Pipeline shall have no responsibility on account of anything which may be done, happen or arise with respect to the gas during the time it is in Atlantic Richfield's facilities or in the Empire Abo Unit or while in Plants and Atlantic Richfield shall indemnify and hold harmless Pipeline from any and all claims, demands and causes of action in this connection. Atlantic Richfield shall have no responsibility with respect to Pipeline's gas or on account of anything which may be done, happen or arise with respect thereto prior to the delivery of Pipeline's gas to Atlantic

Richfield or after the redelivery thereof into Pipeline's facilities and Pipeline shall indemnify and hold harmless Atlantic Richfield from any and all claims, demands and causes of action in this connection.

ARTICLE IX

INTRASTATE USE

9.1 It is a condition of this Agreement, without which the Parties would not have entered into this Agreement, that none of the gas to be delivered and redelivered under the terms hereof, will be subject to jurisdictional consequences of the Federal Power Commission or any successor agency. Likewise, it is a condition of this Agreement that no act, direct or indirect, on the part of either Party, hereto will result in said gas becoming subject to the jurisdiction of the Federal Power Commission. It is recognized that the representation herein constitutes, in part, the consideration for each Party entering this Agreement.

ARTICLE X

FORCE MAJEURE

10.1 Any failure of either Party hereto to perform any of the obligations hereunder shall be excused if, and to the extent, such failure is due to fires, strikes, floods, lack of water, winds, lightning, accidents, or delays on the part of such Party in acquiring, at reasonable cost after the exercise of reasonable diligence, materials, supplies, permits or government approvals required in the construction, maintenance, or repair of any of the facilities or installations necessary to the performance by such Party of its obligation hereunder, or any circumstances, whether similar or dissimilar to the causes above enumerated, beyond the control of the Party failing to perform.

ARTICLE XI

TAXES

11.1 All taxes or assessments which are imposed by the State or other governmental agency or duly constituted authority, either directly or indirectly

on the gas owned by Pipeline or the delivery or redelivery of same hereunder shall be borne and paid solely and entirely by Pipeline.

ARTICLE XII

MISCELLANEOUS

12.1 It is contemplated by Pipeline and Atlantic Richfield that there may arise circumstances during the term of this Agreement that will require, for operational reasons, deviation from the delivery and redelivery terms and conditions hereof and it is agreed that said terms and conditions can be mutually waived in writing or by direct oral or telephone communications, confirmed in writing, between the Parties provided, however, no such waiver shall act as an amendment to this Agreement. The intent of this Paragraph is to provide a procedure whereby the operations of the respective Parties hereto can be performed in response to day-to-day circumstances.

12.2 Notice to each Party hereunder shall be given to such Party at its address first herein shown or at such other address as such Party may from time to time designate to the other Party. All notices, unless otherwise provided herein, shall be given in writing and shall not be deemed to have been given until actual receipt thereof.

12.3 This Agreement shall be subject to all applicable orders, directives, rules and regulations of any governmental body having jurisdiction and it shall otherwise be interpreted, performed and enforced in accordance with the laws of the State of New Mexico.

12.4 This Agreement shall be binding upon and shall inure to the benefit of the Parties and their respective successors and assigns and the rights of Pipeline and the rights of Atlantic Richfield may be assigned in whole or in part at any time and from time to time without consent or approval of the other or any Party hereto, but no transfer of or succession to the interest of either Party hereunder, wholly or partially, shall affect or bind the other Party until

it shall have been furnished a copy of the original instrument or with proper proof that the claimant is legally entitled to such interest. Pipeline further agrees that no such assignment of its interest shall subject any gas in the Empire Abo Unit to be delivered (either directly or indirectly) into an interstate pipeline system.

12.5 All of the Parties executing this Agreement as "Pipeline" shall designate one Party as "Pipeline Representative". Pipeline Representative shall be empowered to do or perform, on behalf of Pipeline, the following:

- A. To allocate commingled gas delivered to Atlantic Richfield as between the Parties furnishing such gas;
- B. To allocate gas redelivered to Pipeline from the Empire Abo Unit;
- C. To witness tests to be made of the gas and measurement equipment;
- D. To deliver and take redelivery of gas hereunder.
- E. To receive and furnish notice of changes in the quantity of gas to be delivered and redelivered hereunder;
- F. To receive billings and pay for services covered hereunder applicable to Pipeline.

Insofar as Pipeline is concerned, Atlantic Richfield shall be fully protected in relying upon any and all such functions done by Pipeline Representative as representative of Pipeline as fully and effectively as though each Pipeline Party had done or performed same. Pipeline Representative shall have full authority to represent all Pipeline Parties in all disputes which may arise between Seller and Pipeline relating to such functions.

IN WITNESS WHEREOF, the Parties hereto cause this Agreement to be duly
executed on the day and year first written above.

ATLANTIC RICHFIELD COMPANY;
EMPIRE ABO UNIT OPERATOR

By _____
Danny D. Echols, Attorney-in-Fact

ATTEST:

SOUTHERN UNION GAS COMPANY

By _____

By _____
Vice-President

LLANO, INCORPORATED

By _____

By _____
President

TUCO, INC.

By _____

By _____
Vice Chairman of the Board

SUPPLEMENTAL AGREEMENT TO
CASINGHEAD GAS CONTRACT

THIS AGREEMENT, made and entered into as of the 3rd day of
June, 1974, between Lee Drilling Company, a Partnership
composed of F. L. Dunn, Jr. and Evans H. Dunn, Rogers Aston, Individually,
Rogers Aston, Trustee for Charles Aston Trust and Lincoln Aston Trust U/W/O
Esther Aston, and Rogers Aston and The First National Bank in Dallas,
Co-Trustees of The "C" Trusts U/W/O Bert Aston, as "Seller," and HONOO
OIL AND GAS COMPANY and AMOCO PRODUCTION COMPANY (formerly Pan American
Petroleum Corporation), as "Buyer,"

W I T N E S S E T H:

WHEREAS, Buyer and Seller are parties to that certain Casinghead
Gas Contract, dated June 1, 1960, providing for the
purchase and sale of casinghead gas to be produced from oil and gas
leases described in Exhibit "1" thereof; and

WHEREAS, said Casinghead Gas Contract, as may have heretofore
been amended, is in full force and effect; and

WHEREAS, Seller contemplates the need for casinghead gas residue
for injection into formations underlying lands described in Exhibit "1"
attached to said Casinghead Gas Contract or to be injected into formations
underlying other lands which will be or have been communitized with
land described in Exhibit "1"; and

WHEREAS, Seller has reserved the right to use residue gas for
such purposes pursuant to the terms of said Casinghead Gas Contract

and Estate of J. P. Dunn, deceased, by
F. L. Dunn, Jr., Executor,

subject to agreement between Buyer and Seller as to compression charges and other conditions of delivery as provided in Article IX B. 2. of said Casinghead Gas Contract; and

WHEREAS, Buyer and Seller desire by this Supplemental Agreement to set out their agreement as to terms and conditions of the delivery of residue gas for injection and charges applicable thereto;

NOW, THEREFORE, in consideration of mutual covenants contained herein and in said Casinghead Gas Contract, Buyer and Seller agree as follows:

1.

Buyer shall make available to Seller at or near the plant fence of the Empire Abo Gasoline Plant located in Section 3, T18S-R27E, NMPM, Eddy County, New Mexico, residue gas volumes for injection by Seller, such volumes being determined in accordance with the terms and conditions of said Casinghead Gas Contract. Such volumes shall be made available to Seller, or its nominee, at the prevailing Empire Abo Gasoline Plant discharge pressure and dehydrated such as not to exceed a water content of seven pounds per one million cubic feet and shall not contain in excess of one grain of hydrogen sulfide per one hundred cubic feet.

The charge to be made by Buyer to Seller shall be Buyer's cost for the services of compressing such residue gas from the plant inlet pressure to the discharge pressure plus Buyer's cost of sweetening and dehydration. Such costs shall be determined in accordance with engineering practices generally used in the industry for each calendar year and shall be applicable to residue gas delivered to Seller for injection for the next succeeding calendar year.

2.

This Supplemental Agreement shall become effective as of the date hereof and shall continue in force and effect for a term contemporaneous with the term of said Casinghead Gas Contract or discontinuation of injection operations, whichever first occurs; provided, however, in the event Buyer has not commenced injection operations by the receipt of gas herein provided for within two (2) years from the date hereof, this Supplemental Agreement shall terminate.

IN WITNESS WHEREOF, Buyer and Seller have affixed their signatures hereto as of the date hereof.

LEE DRILLING COMPANY, A PARTNERSHIP

By: [Signature]

By: [Signature]

ATTEST: _____

By: Edward B. Zimmerman

ESTATE OF J. P. DUNN, DECEASED

By: F. L. Dunn, Jr.
F. L. DUNN, Jr., EXECUTOR

[Signature]
Rogers Aston, Individually, as
Trustee of Charles Aston Trust
and Lincoln Aston Trust, and
as Co-Trustee of The "C" Trusts
U/W/O Bert Aston, deceased
and

FIRST NATIONAL BANK IN DALLAS

By: [Signature]
Assistant Vice President-Trust
Co-Trustee of The "C" Trusts U/W/O
"SELLER" Bert Aston, deceased

HONDO OIL AND GAS COMPANY

BY Danny O. Echols
Attorney-in-Fact

AMOCO PRODUCTION COMPANY

BY _____
Attorney-in-Fact

"BUYER"



Executed by First National Bank in Dallas in accordance with the condition that it have no liability to any individual or entity on any agreement, warranty or indemnity herein contained.

EMPIRE ADO PRESSURE MAINTENANCE PROJECT
(N.M.O.C.C. Orders R-4548, R-4549, R-4549-A, R-4549-B)
Atlantic Richfield Company Operator

Page 1

ABO GAS BANK STATEMENT
Monthly Report for August 1975

(1)	(2)	(3)	(4)	(5)	If Column 5 is 95% or Greater		If Column 5 is less than 95%			(12)	
					(6)	(7)	(8)	(9)	(10)		(11)
MONTH	GAS PRODUCED (MCF)	TOTAL PLANT RESI- DUE AVAIL- ABLE FOR INJECTION (MCF)	GAS INJECTED (MCF)	FRACTION OF AVAILABLE RESIDUE GAS IN- JECTED (Fraction)	(COL 5 - .95) (Fraction)	GAS BANK CREDIT (COL 6 x COL 3) (MCF)	CUMU- LATIVE GAS BANK CREDIT (MCF)	(.95 - COL 5) (Fraction)	GAS BANK DEBIT (COL 9 x COL 3) (MCF)	CUMU- LATIVE GAS BANK DEBIT (MCF)	CUMU- LATIVE CREDIT (MCF)
1975											
January	1,741,012	1,143,415	1,143,415	1.0	.05	57,171	321,438				321,438
February	1,554,911	997,528	969,540	0.9719	.0219	21,846	343,284				343,284
March	1,705,511	1,227,247	1,227,247	1.0	.05	61,362	404,646				404,646
April	1,318,681	980,984	980,984	1.0	.05	49,049	453,695				453,695
May	1,432,141	1,073,979	1,073,979	1.0	.05	53,699	507,394				507,394
June	1,466,542	1,031,323	1,031,323	1.0	.05	51,566	558,960				558,960
July	1,554,094	1,150,227	1,150,227	1.0	.05	57,511	616,460				616,460
August	1,811,369	1,099,433	1,099,433	1.0	.05	54,972	671,432				671,432
September											
October											
November											
December											

BEFORE EXAMINER NUTTER

OIL CONSERVATION COMMISSION

App EXHIBIT NO. 3

CASE NO. 5577

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
App EXHIBIT NO. 3
CASE NO. 5577

EMPIRE ADO PRESSURE MAINTENANCE PROJECT
(N.M.O.C.C. Orders R-4548, R-4549, R-4549-A, R-4549-B)
Atlantic Richfield Company Operator

ABO GAS BANK STATEMENT
Monthly Report for August 1975

(4)	(5) FRACTION OF AVAILABLE RESIDUE GAS IN- JECTED (Fraction)	If Column 5 is 95% or Greater			If Column 5 is less than 95%			(12)	(13)	(14)
		(6) (COL 5 - .95) (Fraction)	(7) GAS BANK CREDIT (COL 6 x COL 3) (MCF)	(8) CUMU- LATIVE GAS BANK CREDIT (MCF)	(9) (.95 - COL 5) (Fraction)	(10) GAS BANK DEBIT (COL 9 x COL 3) (MCF)	(11) CUMU- LATIVE GAS BANK DEBIT (MCF)			
5	1,143,415	1.0	.05	57,171	321,438			321,438	0.	321,438
8	969,540	0.9719	.0219	21,846	343,284			343,284	0.	343,284
7	1,227,247	1.0	.05	61,362	404,646			404,646	0.	404,646
4	980,984	1.0	.05	49,049	453,695			453,695	0.	453,695
9	1,073,979	1.0	.05	53,699	507,394			507,394	0.	507,394
3	1,031,323	1.0	.05	51,566	558,960			558,960	0.	558,960
7	1,150,227	1.0	.05	57,511	616,460			616,460	0.	616,460
3	1,099,433	1.0	.05	54,972	671,432			671,432	0.	671,432

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
Adl EXHIBIT NO. 3
CASE NO. 5577

EMPIRE ABO PRESSURE MAINTENANCE PROJECT

Atlantic Richfield Company Operator

ABO GAS BANK STATEMENT

Page 2

MONTH	(15) GAS INJECTED (MCF)	(16) THREE MONTH RUNNING AVERAGE GAS INJECTED (MCF)	(17) GAS BANK BALANCE (MCF)	(18) IF COLUMN (17) IS GREATER THAN COLUMN (16) THEN GAS BANK BALANCE IS COLUMN (16)
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July	1,150,227	1,028,762	616,460	616,460
August	1,099,433	1,060,696	671,432	671,432
September				
October				
November				
December				

EMPIRE ABO PRESSURE MAINTENANCE PROJECT
(N.M.O.C.C. Orders R-4548, R-4549, R-4549-A, R-4549-B, R-4549-C)
Atlantic Richfield Company Operator

MONTH	NON-ABO GAS BANK STATEMENT				
	Monthly Report for				1975
	(1) GAS INJECTED (MCF)	(2) CUMULATIVE GAS INJECTED (MCF)	(3) GAS DELIVERED TO SUPPLIER (MCF)	(4) CUMULATIVE GAS DELIVERED TO SUPPLIER (MCF)	(5) NET CUMULATIVE NON-ABO GAS BANK (Col (2) - Col (4)) (MCF)
1975					
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					

CASE 5576: Application of George D. Riggs for a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in the Saladar-Yates Pool by the injection of water through his Hughes-Federal No. 4, Malco Well No. 2, and Mayfield-Federal No. 4 Wells located, respectively, in Units F, I, and O of Section 33, Township 20 South, Range 28 East, Eddy County, New Mexico.

CASE 5577: Application of Atlantic Richfield Company for amendment of Order No. R-4549, as amended, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the amendment of Order No. R-4549, as amended, which order approved the institution of the Empire-Abo Pressure Maintenance Project in the Empire-Abo Unit Area, Eddy County, New Mexico, and established rules for the operation of said project. Applicant seeks the amendment of said rules to permit the injection of non-Abo gas and to establish a separate non-Abo gas bank for said project.

Docket No. 26-75

Dockets Nos. 28-75 and 29-75 are tentatively set for hearing on November 5 and November 19, 1975. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: EXAMINER HEARING - WEDNESDAY - OCTOBER 22, 1975

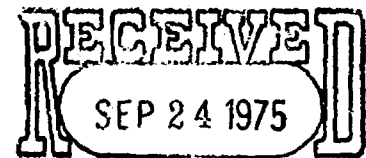
9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING - SANTA FE, NEW MEXICO

The following cases will be heard before Daniel S. Nutter, Examiner, or Richard L. Stamets, Alternate Examiner:

- CASE 5572: Application of Gulf Oil Corporation for downhole commingling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to commingle Blinebry and Drinkard production in the wellbore of its H. T. Mattern Wells Nos. 4 and 8, and its Harry Leonard Well No. 17, located, respectively, in Unit B of Section 1, Township 22 South, Range 36 East, Unit E of Section 6, Township 22 South, Range 37 East, and Unit C of Section 36, Township 21 South, Range 36 East, all in Lea County, New Mexico.
- CASE 5573: Application of El Paso Natural Gas Company for downhole commingling, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks authority to commingle Blanco-Mesa-verde and Basin-Dakota production in the wellbore of its Mudge Well No. 11, located in Unit M of Section 10, Township 31 North, Range 11 West, San Juan County, New Mexico.
- CASE 5574: Application of Filon Exploration Corporation for pool creation, assignment of a discovery allowable, and special pool rules, Sandoval County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new pool for the production of oil from the Entrada formation for its Federal 12 Well No. 1 located in Unit M of Section 12, Township 19 North, Range 4 West, Sandoval County, New Mexico, and the assignment of a discovery allowable to said well; applicant further seeks the promulgation of special pool rules for said pool, including a provision for a special depth bracket allowable.
- CASE 5575: Application of Morris R. Antweil for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Pennsylvanian formation underlying the E/2 of Section 20, Township 22 South, Range 27 East, South Carlsbad Field, Eddy County, New Mexico, to be dedicated to a well to be drilled 2030 feet from the North line and 1980 feet from the East line of said Section 20. Also to be considered will be the cost of drilling and completing said well and the allocation of such costs as well as actual operating costs and charges for supervision. Also to be considered is the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

Case 5577

BEFORE THE OIL CONSERVATION COMMISSION
STATE OF NEW MEXICO



APPLICATION OF ATLANTIC RICHFIELD COMPANY,
UNIT OPERATOR OF THE EMPIRE ABO UNIT EM-
BRACING LANDS IN TOWNSHIPS 17 AND 18 SOUTH,
RANGES 27, 28 AND 29 EAST, EDDY COUNTY TO
INSTITUTE AN IMPROVED PRESSURE MAINTENANCE
PROJECT BY AUGMENTING CURRENT GAS INJECTION
WITH ADDITIONAL NON-ABO GAS. APPLICANT ALSO
SEEKS TO ESTABLISH A SEPARATE NON-ABO GAS
BANK FOR THE EMPIRE ABO PRESSURE MAINTENANCE
PROJECT AS APPROVED BY ORDER R-4549 AND
AMENDED BY ORDERS R-4549A, R-4549B and R-4549C.

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

Comes Atlantic Richfield Company, Unit Operator of the Empire Abo Unit, acting by and through the undersigned attorneys and hereby makes application to institute an improved pressure maintenance project by augmenting current gas injection with additional non-Abo gas. Applicant also seeks to establish a separate non-Abo gas bank for the Empire Abo Pressure Maintenance Project as approved by Order R-4549 and amended by Orders R-4549A, R-4549B and R-4549C, and in support thereof respectfully shows:

1. The Oil Conservation Commission 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, Order R-4549B, dated April 30, 1974 and Order R-4549C, dated July 1, 1975.

2. That in Case No. 5505, pursuant to which Order No. R-4549C was issued there are on file plats showing the boundaries of the unit area and showing those tracts within the unit area committed to the pressure maintenance project.

3. That applicant has developed and has available a supply of non-Abo gas for injection into the Abo gas cap.

4. That such supplemental gas injection will better maintain reservoir pressure and will result in recovery of additional oil over and above that which is anticipated from the present injection of all available Abo residue gas.

Case 5577

5. That the supplier of the non-Abo gas has requested the right to take redelivery of a portion of the gas it has supplied, at a rate not to exceed the daily delivery rate, for not more than 30 days in any one 180 day period.

6. Applicant desires that the right to inject non-Abo gas in connection with the pressure maintenance project be made effective at the earliest possible time.

7. Applicant requests that Order R-4549B be amended so as to set up a separate gas bank covering only non-Abo gas input and withdrawal, so that proper account can be kept separately from the gas bank already set up for available residue gas.

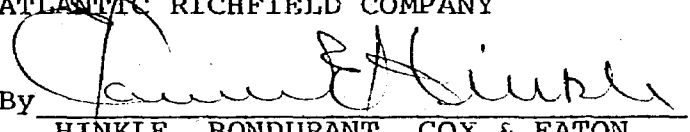
8. In the opinion of applicant, said improved pressure maintenance project by injection of non-Abo gas and separate gas bank provisions as outlined in this application are in the interest of conservation, prevention of waste, the protection of correlative rights, and will tend to promote the greatest 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 October 22, 1975.

Respectfully submitted,

ATLANTIC RICHFIELD COMPANY

By


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

EMPIRE ADO PRESSURE MAINTENANCE PROJECT
(N.M.O.C.C. Orders R-4548, R-4549, R-4549-A, R-4549-B)
Atlantic Richfield Company Operator

ABO GAS BANK STATEMENT
Monthly Report for August 1975

Page 1

(1)	(2)	(3)	(4)	(5)	If Column 5 is 95% or Greater			If Column 5 is less than 95%			(12)
					(6)	(7)	(8)	(9)	(10)	(11)	
MONTH	GAS PRODUCED (MCF)	TOTAL PLANT RESIDUE AVAILABLE FOR INJECTION (MCF)	GAS INJECTED (MCF)	FRACTION OF AVAILABLE RESIDUE GAS INJECTED (Fraction)	(COL 5 - .95) (Fraction)	GAS BANK CREDIT (COL 6 x COL 3) (MCF)	CUMULATIVE GAS BANK CREDIT (MCF)	(.95 - COL 5) (Fraction)	GAS BANK DEBIT (COL 9 x COL 3) (MCF)	CUMULATIVE GAS BANK DEBIT (MCF)	CUMULATIVE CREDIT (MCF)
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March	1,705,511	1,227,247	1,227,247	1.0	.05	61,362	404,646				404,646
April	1,318,681	980,984	980,984	1.0	.05	49,049	453,695				453,695
May	1,432,141	1,073,979	1,073,979	1.0	.05	53,699	507,394				507,394
June	1,466,542	1,031,323	1,031,323	1.0	.05	51,566	558,960				558,960
July	1,554,094	1,150,227	1,150,227	1.0	.05	57,511	616,460				616,460
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September											
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BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 3
CASE NO. 5577

est. oil recovery
will be increased
2.8 million bbls
by inj of non-Abg gas

EMPIRE ADO PRESSURE MAINTENANCE PROJECT
(N.M.O.C.C. Orders R-4548, R-4549, R-4549-A, R-4549-B)
Atlantic Richfield Company Operator

ABO GAS BANK STATEMENT
Monthly Report for August 1975

	(4)	(5)	If Column 5 is 95% or Greater			If Column 5 is less than 95%			(12)	(13)	(14)
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	GAS INJECTED (MCF)	FRACTION OF AVAILABLE RESIDUE GAS INJECTED (Fraction)	(COL 5 - .95) (Fraction)	GAS BANK CREDIT (COL 6 x COL 3) (MCF)	CUMU-LATIVE GAS BANK CREDIT (MCF)	(.95 - COL 5) (Fraction)	GAS BANK DEBIT (COL 9 x COL 3) (MCF)	CUMU-LATIVE GAS BANK DEBIT (MCF)	CUMU-LATIVE CREDIT (MCF)	CUMU-LATIVE DEBIT (MCF)	GAS BANK BALANCE (MCF)
15	1,143,415	1.0	.05	57,171	321,438				321,438	0.	321,438
28	969,540	0.9719	.0219	21,846	343,284				343,284	0.	343,284
47	1,227,247	1.0	.05	61,362	404,646				404,646	0.	404,646
34	980,984	1.0	.05	49,049	453,695				453,695	0.	453,695
79	1,073,979	1.0	.05	53,699	507,394				507,394	0.	507,394
23	1,031,323	1.0	.05	51,566	558,960				558,960	0.	558,960
27	1,150,227	1.0	.05	57,511	616,460				616,460	0.	616,460
13	1,099,433	1.0	.05	54,972	671,432				671,432	0.	671,432

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
App EXHIBIT NO. 3
CASE NO. 5577

est. oil recovery will be increased 2.8 million bbls by inj of non-ABO gas

EMPIRE ABO PRESSURE MAINTENANCE PROJECT

Atlantic Richfield Company Operator

ABO GAS BANK STATEMENT

Page 2

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EMPIRE ABO PRESSURE MAINTENANCE PROJECT
(N.M.O.C.C. Orders R-4548, R-4549, R-4549-A, R-4549-B, R-4549-C)
Atlantic Richfield Company Operator

Page 3

MONTH	NON-ABO GAS BANK STATEMENT				
	Monthly Report for 1975				
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1975					
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					

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. 5577

Order No. R-4549-D

APPLICATION OF ATLANTIC RICHFIELD
COMPANY FOR AMENDMENT OF
ORDER NO. R-4549, AS AMENDED,
EDDY COUNTY, NEW MEXICO

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on Oct 22, 1975,
at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this day of November, 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 pursuant to Commission Order No.
R-4549, dated June 15, 1973, as amended by
Orders Nos. R-4549-A, R-4549-B, and R-4549-C,
dated January 15, 1974, April 30, 1974, and July 1,
1975, respectively, the applicant Atlantic Richfield
Company is conducting pressure maintenance
operations in the Empire Also Unit Area,
Empire Also Pool, Eddy County, New Mexico.

(3) That said pressure maintenance operations include the reinjection of casinghead gas produced from said Empire Abo Pool back into the reservoir from which it came.

(4) That even with the reinjection of all available casinghead gas produced from said ~~the~~ pool, there still remains considerable reservoir voidage resulting from the production of liquid hydrocarbons from the reservoir.

(5) That the applicant seeks to minimize this reservoir voidage by the injection into the Abo formation of extraneous gas brought in from other sources.

(6) That the injection of from 25 million to 35 million cubic feet of extraneous gas ^{per day} into the Abo formation will virtually eliminate the net voidage of the reservoir underlying the Empire Abo Unit Area, will enhance ^{the} recovery of oil from the reservoir and result in the recovery of additional oil, and, ^{will} otherwise prevent waste, will not impair correlative rights, and should be approved.

IT IS THEREFORE ORDERED:

(1) That the Special Rules and Regulations for the Empire-Abo Pressure Maintenance Project, as promulgated by Commission Order No. R-4549, and as amended by Commission Order Nos. R-4549-A, R-4549-B,

and R-4549-C, are hereby further amended by the addition of the following Rule 4(A):

"RULE 4(A).

That in addition to the injection of available residue gas and the establishment of an available residue gas injection bank as described in Rules 3 and 4 above, the project operator may inject up to and including 35 million cubic feet of extraneous gas per day into the ~~also formation underlying the project~~ ^{pending reservoir blow-down,} area; further, That, with draws of said extraneous gas may be made ~~not~~ during not more than 30 days in any one 180-day period, provided however, that the daily rate of withdrawal shall not exceed the average daily rate of injection of such extraneous gas during the preceding 180-day period (or portion thereof if injection has been for less than 180 days), and provided further, that the project operator shall establish and maintain an "Extraneous Gas Bank Statement," which shall be filed with the Commission each month concurrently with the project operator's "Empire Gas Pressure Maintenance Project

Monthly Report" and "Abc Gas Bank
Statements" and which shall show
thereon, ^{each month} the volumes of gas received
from each supplier of extraneous
gas, the ^{monthly} volume of such gas injected,
the cumulative volume of such
gas injected, the ~~monthly~~ ^{monthly} gas
volume of extraneous gas delivered
back to the each supplier of extraneous
gas, the cumulative volume of
such gas delivered back to each
supplier and the net cumulative
extraneous gas bank attributable
to each supplier of extraneous
gas.

(2) That jurisdiction

Done at

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. 5577

Order No. R- 4549-D

APPLICATION OF ATLANTIC RICHFIELD
COMPANY FOR AMENDMENT OF ORDER NO.
R-4549, AS AMENDED, EDDY COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on October 22,
19 75, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this day of November, 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 pursuant to Commission Order No. R-4549, dated
June 15, 1973, as amended by Orders Nos. R-4549-A, R-4549-B,
and R-4549-C, dated January 15, 1974, April 30, 1974, and July 1,
1975, respectively, the applicant Atlantic Richfield Company
is conducting pressure maintenance operations in the Empire
Abo Unit Area, Empire-Abo Pool, Eddy County, New Mexico.

(3) That said pressure maintenance operations include the
reinjection of casinghead gas produced from said Empire-Abo
Pool back into the reservoir from which it came.

(4) That even with the reinjection of all available
casinghead gas produced from said pool, there still remains
considerable reservoir voidage resulting from the production
of liquid hydrocarbons from the reservoir.

(5) That the applicant seeks to minimize this reservoir voidage by the injection into the Abo formation of extraneous gas brought in from other sources.

(6) That the injection of from 25 million to 35 million cubic feet of extraneous gas per day into the Abo formation will virtually eliminate the net voidage of the reservoir underlying the Empire Abo Unit Area, ^{thereby} ~~will~~ enhancing the recovery of oil from the reservoir, ^{will} ~~and~~ result in the recovery of additional oil, and ~~will~~ otherwise prevent waste, will not impair correlative rights, and should be approved.

IT IS THEREFORE ORDERED:

(1) That the Special Rules and Regulations for the Empire-Abo Pressure Maintenance Project, as promulgated by Commission Order No. R-4549, and as amended by Commission Order Nos. R-4549-A, R-4549-B, and R-4549-C, are hereby further amended by the addition of the following Rule 4(A):

"RULE 4(A).

That in addition to the injection of available residue gas and the establishment of an available residue gas injection bank as described in Rules 3 and 4 above, the project operator may inject up to and including 35 million cubic feet of extraneous gas per day into the Abo formation underlying the project area; further, that (pending reservoir blow-down, withdrawals of said extraneous gas may be made, ^{but} during not more than 30 days in any one 180-day period; provided however, that ^{pending blow-down,} the daily rate of withdrawal shall not exceed the average daily rate of injection of such extraneous gas during the preceding 180-day period; ~~(or portion thereof if injection has been less than 180 days)~~ and provided

further, that the project operator shall establish and maintain an "Extraneous Gas Bank Statement" which shall be filed with the Commission each month concurrently with the project operator's "Empire-Abo Pressure Maintenance Project Monthly Report" and "Abo Gas Bank Statement", and which shall show thereon each month the volume ~~of gas received from each supplier~~ of extraneous gas, ~~the volume of such gas~~ injected, the cumulative volume of such gas injected, the volume of ~~extraneous~~ gas delivered back to ~~each~~ ^{the} supplier of extraneous gas, the cumulative volume of ~~such~~ gas delivered back to ~~each~~ ^{the} supplier, and the net cumulative extraneous gas bank, ~~attributable to the each supplier of extraneous gas."~~

(2) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.