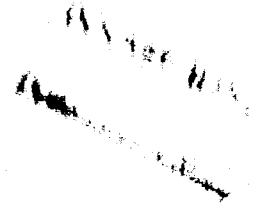
CASE 4628: Appli. of CONTINENTAL FOR ORDER OR ORDERS TO ENSURE RATABLE TAKING OF GAS & EXCEPTION TO ORDER R-1670, RIO ARRIBA.



Case Number

4628

Application

Trascripts

Small Exhibits

ETC.

OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
P. O. BOX 2088 - SANTA FE
87501

April 26, 1972

GOVERNOR
BRUCE KING
CHAIRMAN

LAND COMMISSIONER
ALEX J. ARMIJO
MEMBER

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

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

Re: Case No. 4628
Order No. R-4293
Applicant:
Continental Oil Company

Dear Sir:

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

Very truly yours,

A. L. Porter, Jr.

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

Copy of order also sent to:

Hobbs OCC x
Artesia OCC
Aztec OCC x

Other Mr. Richard S. Morris

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. 4628
Order No. R-4293

APPLICATION OF CONTINENTAL OIL
COMPANY FOR AN ORDER OR ORDERS TO
ENSURE RATABLE TAKING OF GAS AND
AN EXCEPTION TO ORDER NO. R-1670,
RIO ARRIBA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m., January 26, 1972, and on January 27, 1972, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 26th day of April, 1972, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

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

(2) That the applicant, Continental Oil Company, is the operator of the AXI Apache Leases, located in Township 25 North, Ranges 4 and 5 West, NMPM, Rio Arriba County, New Mexico, under leases from the Apache Indian Tribe, and has wells completed in and producing from the South Blanco-Pictured Cliffs Gas Pool.

(3) Southern Union Gas Company owns and operates a gas gathering system in the South Blanco-Pictured Cliffs Pool, Rio Arriba County, New Mexico, to which system one hundred eighteen (118) gas wells in said pool are connected including thirty-one wells owned and operated by Continental Oil Company.

(4) That the South Blanco-Pictured Cliffs Pool is a separate common source of supply of gas, as defined by the Commission, and its production is prorated pursuant to the provisions of Commission Order No. R-1670, as amended.

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. 4628
Order No. R-4293

APPLICATION OF CONTINENTAL OIL
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(3) Southern Union Gas Company owns and operates a gas gathering system in the South Blanco-Pictured Cliffs Pool, Rio Arriba County, New Mexico, to which system one hundred eighteen (118) gas wells in said pool are connected including thirty-one wells owned and operated by Continental Oil Company.

(4) That the South Blanco-Pictured Cliffs Pool is a separate common source of supply of gas, as defined by the Commission, and its production is prorated pursuant to the provisions of Commission Order No. R-1670, as amended.

(5) That under the provisions of Section 65-3-15, New Mexico Statutes, Annotated, 1953 Compilation, as amended, Southern Union Gas Company is a common purchaser of gas in the South Blanco-Pictured Cliffs Pool, subject to the provisions of said Section 65-3-15, NMSA, and to the provisions of Rule 902 of the Commission's Rules and Regulations.

(6) That the applicant seeks the promulgation of the necessary order or orders that will ensure the ratable taking of gas by Southern Union Gas Company from gas wells in the South Blanco-Pictured Cliffs Pool, Rio Arriba County, New Mexico, as required by law, and by the Commission's Rules and Regulations.

(7) Applicant further seeks as an exception to the provisions of Order No. R-1670, as amended, the reclassification of certain of its wells from marginal to non-marginal status, together with authority to carry underproduction for said wells forward from balancing period to balancing period without cancellation as long as the wells remain classified non-marginal.

(8) That under the provisions of said statutes, and Rule 902, a common purchaser is required to purchase without unreasonable discrimination in favor of one producer against another in the price paid, the quantities purchased, the bases of measurement of the gas, or the gas transportation facilities afforded for gas of like quantity, quality and pressure available from such wells. Said statute further requires that a common purchaser taking gas produced from gas wells from a common source of supply shall take ratably under such rules, regulations and orders, concerning quantity, as may be promulgated by the Commission consistent with the act.

(9) It is the duty of the Commission to enforce the provisions of this act, and it is vested with the power, after notice and hearing, to make rules, regulations and orders for that purpose.

(10) That under the provisions of Order No. R-1670, production from the South Blanco-Pictured Cliffs Pool is prorated in order to give each operator in the pool the opportunity, insofar as practicable, to produce his fair share of the gas underlying his tract.

(11) That under the provisions of Order No. R-1670, Rule 16(b), the Secretary-Director of the Commission may reclassify a marginal or non-marginal well at any time the well's production data, deliverability data, or other evidence as to the well's producing ability justifies such reclassification.

(12) That Southern Union Gas Company's pipeline gathering system extends across some ten townships, with compressor facilities located down-stream from applicant's wells and the wells of other producers in the pool.

(13) That the compressor station for the gas gathering system is located in Section 4, Township 25 North, Range 6 West.

(14) That the Lowry section of the gathering system extends north from the compressor station to South Blanco-Pictured Cliffs wells located in Township 26 North, Ranges 6 and 7 West.

(15) That the Ballard section of the gathering system extends West and North from the compressor station to South Blanco-Pictured Cliffs wells located in Township 27 North, Range 8 West.

(16) That the Jicarilla section of the gathering system extends east from the compressor station to South Blanco-Pictured Cliffs wells located in Townships 25 and 26 North, Ranges 3, 4, and 5 West.

(17) That Continental's wells are connected to the Jicarilla section of the gathering system.

(18) That during the first nine months of 1971, monthly average pipeline pressures against which wells owned by Continental Oil Company had to produce ranged from 355 psi to 423 psi, while monthly average pipeline pressures against which wells connected to the Lowry section of Southern Union's gathering system had to produce ranged from 205 psi to 295 psi, thereby creating a pressure differential favoring said Lowry section averaging 143 psi.

(19) In October, 1971, Southern Union Gas Company installed and placed into operation approximately five miles of 12-inch loop line on the trunk of its Jicarilla section that serves Continental's wells and a substantial addition to its compressor facilities which serve Southern Union's gas gathering system in the South Blanco-Pictured Cliffs Pool, including that portion of the system to which Continental's wells are connected.

(20) That during the eight-day period ending January 9, 1972, the daily average pipeline pressures against which wells owned by Continental Oil Company had to produce ranged from 210 psi to 337 psi while the daily average pipeline pressures against which wells connected to the Lowry section of Southern Union's gathering system had to produce ranged from 165 psi to 249 psi, thereby creating a pressure differential favoring said Lowry section averaging 64 psi.

(21) That the differential in line pressure between the Jicarilla section and the Ballard and Lowry sections has been substantially reduced by installation of the loop line and additional compressor facilities.

(22) That the wells owned by Continental Oil Company in the South Blanco-Pictured Cliffs Pool are producing from a portion of the pool having generally less sand thickness and less sand development than the wells of producers connected to the Lowry section of the gathering system.

(23) That based upon said sand thickness and sand development, there is a greater quantity of gas available from wells connected to the Lowry section of the gathering system than from the Continental wells connected to the Jicarilla section of the gathering system.

(24) That gas produced by wells belonging to Continental Oil Company will be available to Southern Union Gas Company until December 31, 1975.

(25) That gas produced by practically all wells connected to the Lowry section will be available to Southern Union Gas Company until February 1, 1984 and for so long thereafter as gas is or can be produced from one or more subject wells.

(26) That gas will be available to Southern Union Gas Company from wells connected to the Ballard section as long as gas is or can be produced from a well or proration unit on any portion of such lands or as long as any of seller's leases or leasehold rights or any renewals or extensions thereof shall remain in force and effect.

(27) That gas will be available to Southern Union Gas Company from wells connected to the Ballard and Lowry sections for a relatively longer period of time than gas will be available from Continental's wells connected to the Jicarilla section.

(28) That considering the quantity of gas available and the relative length of time such gas will be available to Southern Union Gas Company, a difference of approximately 64 psig in line pressures between the Jicarilla section and the Ballard and Lowry sections of the gas gathering system does not constitute an unreasonable difference in transportation facilities afforded.

(29) That Southern Union Gas Company takes gas from the various gas producers connected to its system in the South Blanco-Pictured Cliffs Pool in accordance with a ratable-share procedure established by Southern Union Gas Company which takes into consideration allowables assigned by the Commission.

(30) That Southern Union Gas Company is taking gas ratably from the various gas producers connected to its system in the South Blanco-Pictured Cliffs Pool.

(31) That the applicant's request for the promulgation of the necessary order or orders that will ensure the ratable taking of gas by Southern Union Gas Company should be denied.

(32) That considering the quantity of gas available and the relative length of time such gas will be available to Southern Union Gas Company, a difference in line pressures substantially in excess of 64 psig existing between the Jicarilla section and the Ballard and Lowry sections of the gas gathering system prior to installation of the loop line and additional compression facilities constituted an unreasonable difference in transportation facilities afforded.

(33) That wells belonging to Continental Oil Company and connected to the Jicarilla section of the system would have produced more gas during the period from January 1, 1971, to date of installation of the loop line and additional compressor facilities, but for the unreasonable difference in transportation facilities afforded.

(34) That in order to afford Continental Oil Company the opportunity to produce said additional gas, the wells belonging to Continental Oil Company connected to the Jicarilla section of the gas gathering system should be reclassified non-marginal and their statuses adjusted as of January 1, 1971, and should not be subject to reclassification and cancellation until the first balancing period beginning in 1973.

(35) That the applicant's request for authority to carry underproduction for said wells forward from balancing period to balancing period without cancellation as long as said wells remain classified non-marginal should be denied.

IT IS THEREFORE ORDERED:

(1) That the application of Continental Oil Company for the promulgation of the necessary order or orders to ensure the ratable taking of gas by Southern Union Gas Company is hereby denied.

(2) That effective as of January 1, 1971, the following-described wells belonging to Continental Oil Company in the South Blanco-Pictured Cliffs Pool, Rio Arriba County, New Mexico, are hereby reclassified non-marginal and the status of each adjusted accordingly:

Well Name	No.	Unit	Section	Township	Range
AXI Apache J	1	D	5	25N	5W
AXI Apache J	2	P	5	25N	5W
AXI Apache J	3	E	6	25N	5W
AXI Apache J	5	D	7	25N	5W
AXI Apache J	6	P	7	25N	5W
AXI Apache J	7	D	8	25N	5W

Well Name	No.	Unit	Section	Township	Range
AXI Apache J	8	P	8	25N	5W
AXI Apache J	10	A	5	25N	5W
AXI Apache J	11	A	6	25N	5W
AXI Apache J	12	K	5	25N	5W
AXI Apache K	2	B	4	26N	5W
AXI Apache K	3	A	9	26N	5W
AXI Apache K	4	M	3	26N	5W
AXI Apache K	5	H	10	26N	5W
AXI Apache L	1	M	36	25N	4W
AXI Apache L	2	A	36	25N	4W
AXI Apache L	3	M	35	25N	4W
AXI Apache L	4	M	26	25N	4W
AXI Apache L	5	A	26	25N	4W
AXI Apache L	6	A	25	25N	4W
AXI Apache M	1	M	23	25N	4W
AXI Apache M	3	A	13	25N	4W
AXI Apache M	4	I	24	25N	4W
AXI Apache N	1	A	11	25N	4W
AXI Apache N	3	A	12	25N	4W
AXI Apache N	4	D	12	25N	4W
AXI Apache N	5	M	1	25N	4W
AXI Apache N	6	P	1	25N	4W
AXI Apache N	7	M	12	25N	4W
AXI Apache N	8	P	2	25N	4W
AXI Apache O	1	A	10	25N	4W

(3) That the wells described in Order (2), above, shall be subject to reclassification and cancellation at the first balancing period beginning in January, 1973.

(4) That the application of Continental Oil Company for authority to carry underproduction for the wells described in Order (2), above, forward from balancing period to balancing period without cancellation as long as said wells remain classified non-marginal is hereby denied.

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

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

BRUCE KING, Chairman

ALEX J. ARMIJO, Member

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

S E A L

dr/

NEW MEXICO OIL CONSERVATION COMMISSION

REGULAR HEARING

SANTA FE, NEW MEXICO

REGISTER

HEARING DATE JANUARY 26, 1972 TIME: 9 A.M.

NAME:	REPRESENTING:	LOCATION:
M. N. Barber	Continental Oil Co.	Houston
E. R. Manning	El Paso Natural	El Paso, Tex.
Jason Kellahin	Kellahin & Fox	Santa Fe
Oran L. Hamilton	So Union Gas Co	Dallas
R. J. McCrary	So Union Gas Co	Dallas
William S. Jameson	So. Union Gas Co	Dallas
James R. Long	So. Union Gas Co	Farmington
Richard L. Morris	Montgomery, Federici	Santa Fe
Alvin Dean	Southern Union Gas Co.	Farmington
Joe Gage	So Union Gas Co	Dallas
Emmett Watts	Aztec Oil & Gas	Dallas
Jack Salmon	" " "	FARMINGTON
Wayne Sandel	chas. dietz inc	
Carl Traywick	U S G S	Roswell
P. T. McGrath	" "	Farmington
N O Frederick	U S G S	Roswell
J. A. GILLHAM	USGS	ROSWELL
JERRY LONG	USGS	DURANGO
E R Kenedick	C C C	Aztec

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO
January 27, 1972

SPECIAL HEARING

IN THE MATTER OF:

Application of Continental Oil Company for an order to ensure ratable taking of gas and an exception to Order No. R-1670, Rio Arriba County, New Mexico.

Case No. 4628

BEFORE:

State Geologist A. L. Porter, Jr.,
Secretary-Director

TRANSCRIPT OF HEARING

Volume I

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NEW MEXICO OIL CONSERVATION COMMISSION

REGULAR HEARING

SANTA FE, NEW MEXICO

Hearing Date JANUARY 26, 1972 TIME: 9 A.M.

NAME	REPRESENTING	LOCATION
A. L. Porter, Jr.	NMOCC	Santa Fe
Oliver Seth	Atlantic Richfield Co.	Santa Fe
Victor T. Lyon	NMOCC	Santa Fe
J. L. VanderBoom	Conoco	Hobbs
Jason Kellahin	Kellahin & Fox	Santa Fe
Earl M. Mathes	Conoco	Houston
Nina L. Dunham	R. W. Byram	Santa Fe
Carl Traywick	USGS	Roswell
Victor T. Lyon	NMOCC	Santa Fe
J. L. VanderBoom	Conoco	Hobbs
E. J. Bowlin	Conoco	Houston
J. A. Mazza	Conoco	Casper

MR. PORTER: Good morning, gentlemen. The Hearing will come to order.

This is a Special Hearing by a quorum of the Commission to hear an application of Continental Oil Company, Case 4628.

Mr. Hatch, would you read the description of the application.

MR. HATCH: Case 4628, Application of Continental Oil Company for an order or orders to ensure ratable taxing of gas and an exception to Order No. R-1670, Rio Arriba County, New Mexico.

MR. PORTER: Before getting on the way with any testimony, may we have identification of parties for the record.

MR. KELLAHIN: Jason W. Kellahin, Kellahin & Fox, Santa Fe.

I have appearing with me Mr. Jim Bowdin, a member of the Texas Bar from Houston, Texas, appearing for Continental Oil Co.

MR. PORTER: Mr. Morris.

MR. MORRIS: If the Commission please, I am Richard Morris of Montgomery, Federici, Andrews, Hannahs & Morris, Santa Fe, appearing for Southern Union Gas Company.

Appearing with me is Mr. William S. Jameson of the Texas Bar, who will participate with me in the presentation of the case for Southern Union Gas.

Mr. Porter, while I am on my feet, could I request permission of the Commission to make a very brief opening

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statement on behalf of Southern Union before the presentation of any of the evidence?

MR. PORTER: Yes. The Commission will allow you to make a statement, Mr. Morris.

However, I would like to continue at this time with the appearances.

MR. MORRIS: Yes, sir.

MR. PORTER: Does anyone else desire to make an appearance?

The Commission recognizes Mr. Morris.

MR. MORRIS: If the Commission please, in a case of this sort, which is not exactly an ordinary type case for the Commission, we thought it might be advisable before any of the evidence is presented to present a brief statement in an attempt to focus on the issue that is before the Commission in this hearing.

I don't intend by this opening statement to review the evidence we would intend to present, or try to anticipate the evidence that Continental may present, but from the petition, the application that has been filed by Continental in this case, it, of course, is obvious that Continental is contending that there has been a violation of the Common Purchaser Act, the ratable take provision of that act, and I am referring to Section 65-3-15, New Mexico Statutes Annotated.

Now, that Act, that Statute is quite explicit as to the

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duties of a Common Purchaser of gas in a Field. What it's obligations are to the purchaser, I mean the producers that are connected to its system, and what would constitute a violation of its duties as a common purchaser.

I would like to just outline, without reading the Statute, I would like to outline the provisions of it.

The Common Purchaser Act requires a Common Purchaser, that is, a company such as Southern Union Gas Company, who holds itself out as a purchaser of gas in the pool--the Statute requires the Common Purchaser to purchase without unreasonable discrimination, and that is the key phrase that you will be hearing again and again in this proceeding, "Without unreasonable discrimination" between producers that are connected to its facilities.

This is not a requirement that all producers in the pool be treated the same way.

It is a requirement that all of the producers connected to the gathering system of that particular purchaser be treated without unreasonable discrimination.

It is not even a requirement that all of the producers connected to one system be treated identically.

I think the Statute by using the term, "Without unreasonable discrimination" recognizes that there will be differences in the treatment of various producers, and as long as that variation in treatment as a pattern does not amount to

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unreasonable discrimination, there is no violation of the Common Purchaser's duty.

Now, specifically the Statute goes on, it doesn't just say "Without unreasonable discrimination." They leave it up to the Commission to determine, without any further standards to go by, what constitutes unreasonable discrimination.

The Statute specifically goes on, and it recognizes that unreasonable discrimination does not exist, does not result even if there are differences in the prices paid or the facilities afforded, or both.

If such differences bear a fair relationship to the differences in quality, quantity, or pressure of the gas or to the relative lengths of time the gas will be available to the purchaser.

The Statute also specifically recognizes that no purchaser is required, either directly or indirectly, to purchase gas that cannot be economically and satisfactorily used by the gas transportation facilities then in service.

I think that it is important at the outset of this hearing to focus on the real issue in the case. That is, what is the real issue and what are red herring issues in this kind of proceeding.

The issue is not simply whether the facilities afforded by Southern Union Gas Company, in this case to Continental, are equivalent to those afforded to other producers in the South

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Blanco-Pictured Cliffs Pool.

Now, we will explain, when it comes time for us to present our part of the case, the exact nature of the differences that do exist as to the facilities afforded to the various producers in this Pool.

The issue in this case is whether in consideration of pressure prices paid for gas, quantity of gas available and the quality of gas available, and the relative length of time that this gas will be available to Southern Union, whether in consideration of all of those factors, there is unreasonable discrimination, and it is not simply a question of whether this is a difference between the facilities afforded to one producer or to another, and even more specifically, we would represent to the Commission that we believe our evidence and all of the evidence in this case will show that where there are differences in pressure, where there are differences in facilities afforded there are counter-balancing considerations in terms of price, in terms of gas available, in terms of the gas purchase contracts, the period of time that these contracts extend over, that all considered together will show that there is no unreasonable discrimination practiced in this Field.

With that, we would ask that the Commission bear in mind when it hears the Continental portion of this case, please to remember that Southern Union has, as in any case, has its side of the case to present, and we believe when all of the evidence

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is considered the Commission will deny the application in this case. Thank you.

MR. PORTER: Mr. Kellahin?

MR. KELLAHIN: If the Commission please, basically, of course, I would have to agree with Mr. Morris on his interpretation of the Common Purchaser Act, up to the point of his conclusions, rather than go into that right at the moment--

MR. PORTER: I think that is very often the case, Mr. Kellahin.

MR. KELLAHIN: It is a normal situation when you have two opposing attorneys.

This case has been brought on before the Commission on the application of Continental Oil Company, and its application for an order of this Commission to ensure ratable taking of gas by Southern Union's Gas Company from gas wells in the South Blanco-Pictured Cliffs Pool, Rio Arriba County, New Mexico.

We further seek the reclassification of our wells, Continental Oil wells from marginal to non-marginal status with the authority to carry underproduction from such wells forward without cancellation as long as these wells are being classified non-marginal.

Now, our situation is simply this: The South Blanco-Pictured Cliffs Pool, all of our testimony and all of our argument in all of our case is based on gas takes in the South Blanco-Pictured Cliffs Gas Pool, and all of our argument and all

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of our case is based on connection to Southern Union's Gas system.

We are not talking about any other operator, any other pool, or any other gas.

Now, South Blanco-Pictured Cliffs Pool was created in May of 1952, and proration was instituted March 1st, 1955.

At the present time the allocation of production is under the provision of Order No. R-1670, which was adopted in May, 1956 and merely carries forward the prior proration orders which were in effect in this Pool.

As far as I know, and I am sure this is correct, this is the first time in the history of the Oil Conservation Commission that it has been asked to pass on a question involving the Common Purchaser Act.

Now, all of the proration orders of the Commission which are entered under other statutes, which are really not in question here, but have been in effect for many, many years, without any dispute, these proration orders are designed in effect to accomplish a ratable take and to a considerable extent they have accomplished exactly that.

The Oil Conservation Commission has determined that the allowable formula in effect in this Pool protects correlative rights under this allowable assigned to the non-marginal wells.

This is where we come to the crux of the matter.

If the allowable is produced by those wells, but if the

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wells are prevented from producing their assigned allowable--let's take a non-marginal well, and it has an allowable, but because of the excessive line pressures maintained by the gas purchaser against that well, the well is unable to produce its allowable. It automatically becomes a marginal well.

The inequity is then carried forward for the reason that it has no allowable assigned to it and there is no under production carried forward for that well, so the Commission from its own records can determine the extent of this inequity.

Now, the Commission is obligated to assign allowables. We feel it has done so in regard to the non-marginal wells, but there the Commission is prevented from accomplishing the designed purpose of keeping it in equity because of the high line pressures which are not under their control, but are in fact under the control of the gas purchaser.

Therefore, the gas purchaser has in effect usurped the authority of the Commission, has subverted the Commission system of prorating equities, prorating to protect equipment, and has instituted a system of their own which obviously differs from that of the Commission.

Now, we have brought this case before the Commission, as Mr. Morris said, under the provisions of Section 65-3-15, which is the Common Purchaser Act.

Now, this Act vests in the Oil Conservation Commission the duty of promulgating rules, regulations, and orders to ensure

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ratable taking of gas, and it requires any common purchaser to take ratables under such rules, regulations, or orders.

I don't think there is any question but that Southern Union Gas Company is a common purchaser, a common purchaser being defined as "any person now or hereafter engaged in purchasing from one or more producers gas produced from the gas wells in a common source of supply."

Now, Mr. Morris was stating that under the provisions of this Act the Commission must take into consideration in regard to facilities--and perhaps I misunderstood his argument--but this is the way I understood it--must take into consideration the facilities that are afforded along with differences in the price, quality, quantity, etc.

Now, the Common Purchaser Act, subsection d, provides that such purchases shall be made without unreasonable discrimination in favor of one producer against others in the price paid.

We are not talking about the price paid for the quantity purchased.

We are talking about--and our testimony will so show--the basis of measurement. We are not arguing about the basis of measurement. I think that is uniform throughout the Pool, or the gas transportation facilities afforded for gas of like quantity, quality, and pressure available from such wells.

We are talking primarily about the gas transportation facilities that are being enforced.

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The Act further states that the Commission can take into consideration, and it shall not constitute unreasonable discrimination, if the differences bear a fair relationship--and I emphasize "fair" because I think our testimony will show there is no fair relationship involved in this gas system--if they bear a fair relationship to the differences in quality, quantity or pressure of the gas available or the relative lengths of time during which the gas will be available to the purchaser.

We don't know anything about Southern Union contracts or how long the gas will be available. We only know we have a contract with Southern Union Gas, and we feel we are being discriminated against in the South Blanco-Pictured Cliffs Gas Pool.

Now, Rule 902 of the Commission Rules and Regulations paraphrases the Statute which we just quoted.

It makes essentially the same provisions.

The evidence that we will offer will show that the Continental Oil Company has in the past been forced to produce against line pressures that have ranged from 498 pounds to 511 pounds, while during the same period other wells connected with the same system producing from the same common source of supply were bucking line pressures of 322 pounds.

We will also show that Southern Union subsequent to the filing of this application has reduced the line pressures.

We won't say it was done because of the application because

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part of this work was commenced prior to our filing the application, but in response, we feel, to demands which had been made by Continental Oil Company in the past.

We will show, our evidence will show that the high pressures have resulted in curtailed production in Continental Oil Company's wells causing these wells to be classified as marginal wells, when in fact producing against pressures that were available to other operators.

If these wells would have been non-marginal, they would have been assigned allowables, would have carried forward any underproduction assigned to them.

As a matter of fact, when in October Southern Union Gas Company did reduce the pressures against Continental Oil Company, twelve of our wells were able to produce volumes of gas equal to an assigned allowable, and in fact these wells are non-marginal wells.

MR. PORTER: That is October, 1971?

MR. KELLAHIN: Yes. So, at least twelve wells in this system right now which are non-marginal, although they are carried on the schedule as marginal because of their past history.

It is relief from this situation that we are asking in this proceeding. We have made considerable studies and we will try to hold our testimony down to some reasonable length for that purpose.

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Our present plan is to only call one witness. Mr. Earl Mattes, an engineer from Houston, Texas.

MR. PORTER: Mr. Kellahin, how many witnesses do you intend to present?

MR. KELLAHIN: I would say at the present time we only intend to call one. We may have a rebuttal witness, depending on what develops during the course of the testimony.

MR. PORTER: Mr. Morris, how many witnesses do you have?

MR. MORRIS: We probably will have three witnesses.

MR. PORTER: Are they all present?

Let's have all of the witnesses sworn.

We might as well have your rebuttal witness sworn.

We won't require him to rescind his oath if he doesn't testify.

(Whereupon the witnesses were sworn.)

MR. PORTER: Would you have your witness take the stand?

EARL MATTES

a witness, having been first duly sworn according to law, upon his oath, testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN

Q Will you state your name, please?

A My name is Earl Mattes.

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Q All right. By whom are you employed and in what position, Mr. Mattes?

A I am employed by Continental Oil Company as a Senior Staff Engineer in the Production Headquarters, Production Engineering Services Staff.

Q Where are you located?

A Houston, Texas.

Q How long have you had that position, Mr. Mattes?

A Since March of 1971.

Q Now, have you ever testified before the Oil Conservation Commission in New Mexico?

A No.

Q For the benefit of the Commission would you please outline your education and your work experience as a petroleum engineer?

A Yes. I was graduated in June, 1950, from the University of Pittsburgh with a Bachelor of Science degree in Petroleum Engineering.

Upon graduation I went to work for Continental and worked for four years in various engineering assignments in the Texas Gulf Coast and Louisiana Gulf Coast areas, and from 1955 to 1964 I was employed in various district engineering capacities in four of the district offices in the Texas-Louisiana coast area.

Q What districts were those?

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A They were the McAllen, Texas, Ville Platte, Louisiana; Saint Landry, Louisiana, and Corpus Christi, Texas.

1964 to 1966 I was District Superintendent for Continental at Pampa, Texas district.

From 1965 to 1967 I was employed as District Manager of the Lake Charles,District Office of Continental's CAGC operations.

In 1967 I was Assistant to the Vice-President of Production, Exploration Group of Continental Western Hemisphere Petroleum Division in Houston; and in 1968 I was Assistant Division Manager of the Oklahoma City Division in Oklahoma City.

In 1968 to 1971 I was manager of the New Project Development Group that was a part of the Continental Headquarters Natural Gas and Gas Products Department in Houston; and since March, I have been employed in my present job.

Q In connection with your work for Continental Oil Company did you have any experience in the production and operation of gas pools?

A Yes, I did.

Q Did you have an occasion to observe the manner of production of pipelines connected to gas wells operated by Continental Oil Company?

A Yes, sir.

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Q Have you been associated with the problems Continental feels it has in the South Blanco-Pictured Cliffs Gas Pool?

A Yes, I have.

Q What was your association with that problem?

A Well, in March I first became acquainted with the problem we were having or we felt we had in the South Blanco-Pictured Cliffs Pool.

I was asked to help our Casper Division see if there wasn't a way that we could find to help Continental achieve higher rates of production from this area.

Q Did you become familiar with the wells operated by Continental Oil Company in that area?

A Yes, sir, I did.

Q Did you become familiar with the wells operated by other operators in that area?

A Yes, sir, I did that, too.

Q When I say "area," I am referring to the South Blanco-Pictured Cliffs Pool area.

A Yes.

Q Is all your testimony confined to that Pool?

A Yes.

Q Is all of your testimony directed to the operation of the Southern Union Gas Company Gathering System?

A Yes, in the production of Continental wells.

Q Now, would you identify that area that Continental is

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concerned with in this Pool?

A Yes, sir. The area that we are concerned with in the Pool that we are talking about is shown on the map on the extreme left.

Q Can you get up there and talk?

A Yes, sir. This area is in Township 25 North and Township 26 North, and Ranges 4 West and 5 West in Rio Arriba County, New Mexico.

The Continental leases that we are referring to are colored yellow on this map.

They include the Axi-Apache J lease which is Section 5, Section 7, and 8, Township 24 North, Range 4 West, the Axi-Apache-K lease, which is in Section 3, Section 4, Section 9, and Section 10 of 26-5 and the Axi-Apache-L, M, N, and O lease(s) which are comprised out of 16 sections of Township 25 North, Range 4 West.

The wells that we have been talking about are those wells in the South Blanco-Pictured Cliffs Pool, and each of the 31 wells that Continental operates in this pool are shown on this map with a red dot.

Q Some of the wells are marked with an arrow. Will you come to those later in your testimony?

A Yes, sir, I will.

Q Mr. Mattes, do you have a typed log showing the South Blanco-Pictured Cliffs Formation?

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A Yes, sir, but I forgot to bring it.

(Whereupon a brief off the record discussion ensued.)

THE WITNESS: This is the log of the Axi Apache J-1. It is Exhibit 2.

This log shows the top of the Pictured Cliffs Formation at about 2,900 feet with the base of the Formation at about 2,917 feet.

The interval that has been perforated in this well is also shown as being from 2,900 to 2,918 feet.

You will notice in the ~~title~~ Typical Log at the bottom, that this well is shown as Humble Oil & Refining Company Jicarilla-J-1.

This well was drilled by Humble, and subsequently acquired by Continental Oil Company.

Current records of the Commission reflect that this well is Continental A-xi-Apache-J-1.

Q Is this the same zone you have marked that is producing from all of the Continental wells shown on Exhibit 1?

A Yes, it is.

Q And it is typical of the South Blanco-Pictured Cliffs Formation?

A There are variations in character of the sand, but it is the same interval.

Q In connection with the South Blanco-Pictured Cliffs Pool, do you know what the vertical horizon involved in this is as defined by the Commission?

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A It is defined as the interval that I have described, between 2,900 and 2,917 on this log, but not--

Q In the Commission Order it is only described as the Pictured Cliffs Formation?

A That is true.

Q There is no order setting a vertical limit by footage?

A That is right.

Q To your knowledge?

A Yes.

Q Now, would you refer to Exhibit No. 3, Mr. Mattes, and tell us the information that is shown on that exhibit?

A Exhibit 3 is simply a reproduction of the Commission's allowable schedule for the wells in the South Blanco-Pictured Cliffs Pool that are connected to Southern Union Gas Company.

All we did was take those pages out of the January Allowable Schedule, and have them reproduced on a single sheet of paper.

Q This is a reproduction of an official schedule prepared by the Oil Conservation Commission?

A That is right.

Q For what month?

A For the month of January, 1972.

Q Now, does this show all of the South Blanco-Pictured Cliffs wells prorated as of that date?

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A Yes, that is right.
Q Does it also show all of the Continental wells shown on Exhibit 1?
A Yes, it does.

You will notice all of the Continental wells, all thirty-one are carried as marginal or exempt-marginal wells on this schedule.

Q In your opinion, are these in fact marginal wells?
A It depends on the pressure that they have to produce against.
Q Now, the work that you have done and the investigation that you have made will be related to only these wells shown on this exhibit; is that correct?
A That is right.
Q Now, Mr. Mattes, of course the Commission if familiar with its own calculation formula for the allocation of production and the determination of the deliverability, which is a factor in production; have you prepared an exhibit which shows this formula?
A Yes, I have.
Q Would you say that is marked as Exhibit No. 3?
A Yes, that is Exhibit No. 3. This is simply a--
Q Four?
A Excuse me, four. That is right.

This is Exhibit 4, and it just is a recreation of the Commission's only deliverability formula, and you can see

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it is shown at the very top of the exhibit, tabulated beneath the formula, are the critical elements that go to make up the factors in the formula.

The D is calculated deliverability, and Mcf per day. This is the integrated volume in Mcf's per day obtained from the 7-day flow period pp's of c is the 7-day shut-in wellhead pressure and pound per square inch.

B-C-D is equal to deliverability pressure at point A in PSI. P-C-W is the static wellhead working pressure in psi absolute, and the point .85 eight five is the pool slop for the South Blanco-Pictured Cliffs Pool.

Q These are approximations to which your testimony will refer during the rest of this presentation, is it not?

A That is true.

Q That is the reason you offer the exhibit, to explain what we are talking about?

A That is right.

Q Mr. Mattes, can you tell us how long you have been associated with this problem that is involved in the Continental Application in this case?

A Yes, I have been associated with this problem since about March, 1971.

Q What have you done?

A Well, one of the things that I have done, and I made a field trip in late May and early June to observe the

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physical facilities and the wells that we are going to talk about here today, and in this trip I went to the wells that are in this pool, and what I have done is I have taken the wells that are in this map and plotted them on this map with the remainder of the wells that are connected to Southern Union's Dogie Compressor Gathering System.

Q You said, "This map," are you referring to what has been marked Exhibit No. 5?

A Yes, this is Exhibit No. 5. The base for this map is the pipeline map of the area that has been provided to Continental by Southern Union.

Q There have been some changes in their facilities subsequent to that map, have there not?

A That is right. This map was current at the time I made this trip I have described to you.

Q Now, you said you inspected the facilities. What did you inspect at that time?

A What I did was I went and looked at the meter, L-10 meter chart reading on the wells where a green block is shown, and the pressure that is shown in the green block is the pressure conversion that I made from the L-10 reading of the meter chart at the well where I made the reading.

Q Now, what is an L-10 meter reading?

A An L-10 is simply a chart that records the square root of the pressures and the differential pressures that the meter

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orifice meter is recording.

Q What is the purpose of this chart? What is it used for?

A It is used to transfer title of the gas.

Q Are you saying that that is the measure upon which Southern Union Gas Company pays Continental for its production?

A Yes, sir.

Q That is the measure of the gas produced.

A That is true.

Q Does it also show working pressures?

A Yes, it shows the pressure that exists in the meter at any specific time.

Q Now, does this pressure in the meter in any way reflect the pressure in the line to which the meter is connected?

A Yes, it does. It is that pressure, the pressure to the meter, the pressure in the line at that point.

Q You started to describe the pressures you found. Would you discuss the differences you found within their system?

A Yes, sir, I will. You will notice that the Continental Axi Apache L-3 had a pressure of 440 psi. It also had a pressure of 415. This hydraulic gradient continues all of the way over to the Axi Apache--I believe it is Y-3, and where it was 397 pounds.

In looking through the Field I noted that some of the other wells had substantially different pressures, which I did not record, and in trying to ascertain the reason for

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this difference I went into Southern Union's DogieCompressor Station.

Q You say you noticed a substantially different pressure in your other wells. Where, in the same system, in the same leg of the system, or in other areas?

A In the same system and in other areas, too.

Q So then you went to the DogieCanyon Station?

A That is right.

Q What is located there?

A Well, at the time I went there were four compressors in the Dogie Canyon Station.

One was an Ingersol-Rand SVG-A-3 with two Solar Saturn 1,100 hp centrifugal units, and on the compressor site, but not connected up, was a Solar Saturn 3,300 hp compressor.

I noticed that the SVG-A-3 had a gage on the suction side that showed the 225 psi that I have shown here in 26,6.

Q That is the location of the compressor station right there?

A That is the location of the compressor station there.

Q You labeled branches from that northwest and west?

A Yes, that is right.

Q They are all connected to the same station?

A Yes, all of the three charts that I have shown, or the four, have been labeled northwest and west to define that direction from Dogie Canyon Station, which they serve.

Q Now what did you do in connection with the system pressures

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in these different legs or segments of the gathering system?

A At the time that I was in the Field I didn't recognize the significance of the differences that I have observed when I was at the Station, but when I was there the two Solar Saturn 1,100 hp units obviously were installed, and only one was working, and it had a section pressure of 360 pounds, and the SVG-8 was working, and it had a discharge pressure of 440 pounds, and the Saturn had a discharge pattern of 440 pounds, and it wasn't until I got back to the office and looked at this map that I concluded that since all of these lines came into the same compressor station, and we had 397 pounds on our J lease, that the Saturn unit was serving the east trunk and the SVG-8 was serving the north trunk.

Q Would you repeat the location of each of the wells you gave the pressure on and the point at which you took the Compressor Station pressures?

A Yes, I will. Axi Apache L-3 in 35-25-4 had a pressure of 440 psi, and Axi Apache N-7 in 12-20-25-4 had a pressure of 410 psi; Axi Apache N-A-N-225-4 had a pressure of 403 psi.

I can't read this number, but the well is in 6-25-5, and it had a pressure of 397 psi.

Q Axi J-3?

A That would be Axi J-3, that is right.

Q In the other pressures you took only at the Compressor

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Station; is that correct?

A That is right.

Q Based on this information, was it your opinion that Continental Oil well company was in fact being discriminated against at that time?

A Yes.

Q What led you to that conclusion?

A Well, what led me to that conclusion was the fact that our wells were in an all marginal and other wells in the same common source of supply with reasonable comparable producing characteristics had allowable proratable allowable assigned to them.

Q Now, is it the first evidence that you had that led you to believe Continental wells were being discriminated against by the Gathering System pressures?

A Yes, sir, it was. We had the standard evidence that is available from reviewing the individual well deliverability test summary that is compiled in the engineering report of the Commission, but the fact of the difference in the pressure of the suction pressure of the compressor serving the various trunks was the first evidence we had of the real reason for the differences in the pressures that these wells were afforded to produce against.

Q Well, now approximately what was the difference in pressures on the two systems, the east portion of the system and the

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north portion of the system?

A Well, the east trunk had a Gathering System pressure that was about 50 percent higher than the north trunk.

Q Now, you said the pressures were evident at the time of your field trip. Are they representative of today's conditions in this pipeline system?

A No, sir, they are not. During the summer Southern Union installed the 3,300 Solar Centaur centrifugal compressor and connected it up, and they also installed a 12-inch loop on the east trunk, and I have shown this loop in red on Exhibit 6.

It extends from the DogieCompressor Station to about the west line of Continental Axi Apache J lease.

Q Would you point out the location of that on the map, the Axi Apache J lease?

A Yes, the Axi Apache J lease is in 25-5.

Q That would be the first group of wells to the east of the compressor station?

A That is right.

Q Approximately what is that distance?

A I would say it is about four miles.

Q And approximately what is the distance north of the compressor station to the first group of wells?

A It is about three miles.

Q Now, has this looping an additional compressor facility

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made any difference in the operation of Continental wells?

A Yes, sir, it has. The wells are producing at substantially higher rates than they were producing at the time the pressures of Exhibit 5 were in evidence.

Q Now, when did the facilities go into operation, according to your experience?

A Well, according to our records, our individual well records, sometime in early October. I'm not sure exactly because you can't see, you know, there was up and downs, but early in October they had the system connected up and operative.

Q You did notice?

A And we first began to see the increase in production in our wells.

Q Did you make a second pressure survey?

A Yes, sir.

Q When was that made?

A On January 18, 1972. Continental field personnel went out and took the pressures at the meter charts on the wells that are shown on Exhibit 6.

You can s[illegible] from these pressure observations that the east trunk had a pressure of 250 psi at the western edge [illegible]f the Axi Apache J lease in 25-5, and this pressure was increased through the hydraulic radiant to a pressure of 292 pounds at the south end of Continental leases at L-1 Axi-Apache in 25-4.

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On the North system, the pressure ranged from 189 lbs. in 16 of 26-6 to 235 lbs. in section 4-14 of 26-7, and to 250 lbs. in 19 of 27-8.

Q Whose wells were those?

A These are Southern Union Production Company's.

Q There is a change not only in the pressures but in the producing rates between the east leg of the system and the north portion of the system; is that correct?

A That is correct. The pressures in this area are down about 30-35 pounds, and the pressures in this segment are down 130 pounds.

Q Now, what is the pressure at the present time?

A Just based on the geographic distance from the Compressor Station to the closest point on the line that we can compare, it is about 60 pounds.

Q And that has gone a long way toward solving Continental's problem, has it not?

A Yes, it has.

Q But has it solved Continental's problems?

A No, it hasn't.

Q Was the percentage of differential related to the system of pressure in both trunks?

A Well, if you consider the 189 pounds that is in evidence at the south end of the wells in 26-6, and compared to the pressure at the west end of the Y lease well in 25-25.

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They enjoy a gathering system pressure which is about one-third higher than the wells in Townships 26-6, Range 6 West.

Q Now, do you feel that this is still a substantial difference?

A Yes, I do.

Q Do you feel that it is an unreasonable discrimination?

A Yes, it is unreasonable.

Q Now, can you tell us why this difference exists today?

A Well, it is my opinion, based on conversations with field personnel, that the SJJ-8 is still connected at the north and west trunks, which serves the wells in 26-6 and 26-7, and 27-8.

The east trunk is connected to one or more of the centrifugals. I don't know which one. And the various compressors have different suction pressures, and these, the suction pressures of these compressors are reflected in the differential in the different pressures that exist in the trunks, as I have shown on Exhibit 6.

MR. PORTER: Mr. Mattes, Commissioner Armesho has a question as to why you didn't use the same wells on Exhibit 5 and 6 to show the pressures?

THE WITNESS: The reason we didn't use the same wells is, I guess, mostly through oversight, but we were really trying in Exhibit 6 to establish hydraulic gradients across Southern

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Union's system, but when I made my Field trip I had no such objective.

I was trying to survey as many wells as I could to see what the size of our problem was, and the wells that I have surveyed at that time didn't totally reflect the hydraulic gradients that I thought were of essence to our testimony here today.

Q (By Mr. Kellahin) And along that line, would there be any substantial difference in the pipeline pressures on wells located in the same areas as shown on Exhibit 6?

A Would you repeat that question?

Q Would there be any substantial difference in the pipeline pressures between wells located in the same area?

A No, not much difference, no.

Q It would be substantially the same?

A Yes.

Q So, the fact that you did not use the same wells, would that be a significant factor in interpreting Exhibits 5 and 6?

A No, it would not.

Q Now, have you discussed this differential with Southern Union Gas Company?

A Yes, we did.

Q Before and at the time they installed the compressor equipment, subsequent to that?

A I talked to them before they installed the compression

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equipment.

Q And before they lopped the line in?

A Yes.

Q Have they been contacted since then in regard to this 60 pound differential that we are talking about now?

A I didn't talk to them about it.

Q You did not?

A No, sir.

Q Do you know whether anyone has in your company?

A Not in Continental. I thought you talked to them, Jason?

Q I only talked to their attorney.

A Oh.

Q Now, did the Continental Oil Company run any Field tests to determine whether the differentials in pressures was a significant thing or not?

A Yes, we did. What we did was we ran six special deliverability tests using a portable compressor.

The wells we selected for these tests are those that are shown by the area on Exhibit 1.

Q Why were those particular wells selected?

A They were just--they showed, they covered the range of leases that we were concerned with.

Q Do you feel they are representative of Continental's problem in connection with these line pressures?

A Yes, sir, they are fairly so.

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Q Would they be representative of all of the Continental wells in this Pool?

A Yes, sir.

Q Referring to what has been marked Continental Exhibit No. 7, would you identify that exhibit?

A Yes. Exhibit 7 summarizes the results of the special compressor deliverability tests we ran on the six wells.

Also shown on Exhibit 7 are the tests that we filed for these same wells to the Commission for their use in calculating 1971 allowables.

You will note from comparing the stabilized flow rates for these wells on Exhibit 7 that the quantity of gas produced, which is shown on under the column headed Q, the stabilized flow volume for these tests shows a dramatic increase for those times when the well was on our compressor test.

You will note, for instance, that L-1 enjoyed a stabilized production increase in excess of five times the 1970 rate.

Of course, the reduction in pressure was of the order of 300 pounds. The pressure reduction on this well is shown under the column headed P's of W, which is the static well back pressure.

Q That would indicate then that the well when tested in 1970 for proration purposes was producing against 478 pounds

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back pressure, and when tested with your testing equipment it was producing against 177 pounds; is that correct?

A That is correct.

Q Now, did you conduct these tests, Mr. Mattes?

A Well, these tests were all run according to Commission rules for taking the deliverability tests, which are required by them for allowable purposes.

The compressor arrangement and the free-flow portion of the test of the L-1 well I have cited was witnessed by a Commission representative.

We contacted Southern Union in early August and invited them to witness them, too, but as far as I know they never advised us of any appearance they would make.

The results of these tests have been recorded on Commission Form C-122-A, which is the form that is used for reporting the Annual Deliverability test.

Q They have not been filed with the Commission for allowable purposes?

A No, sir, they have not.

Q This is the first time they have ever been exhibited to the Commission?

A That is true. And I guess we can file them as Exhibits 8 through 13.

Q Yes.

MR. PORTER: Let's identify those, please.

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MR. KELLAHIN: They are Exhibits 8 through 13 inclusive.

Do you want to identify them one by one?

MR. PORTER: Well, yes, sir.

Q (By Mr. Kellahin) Would you go through those, Mr. Mattes, starting with Exhibit 8, and identify each one of the exhibits by exhibit number and well tested. We have the number on the Commission copy but I don't have them on-- Thank you.

A Exhibit 8 is the Form C-122-A for the special deliverability test run on Conoco Axi Apache J-1.

Exhibit 9 is a special deliverability test report on Form C-122-A for Conoco Axi Apache 0-1.

Exhibit 10 is the special deliverability test reported on Form C-122-A for Conoco Axi Apache J-2.

Exhibit 11 is a special deliverability test reported on Form C-122-A for Axi Apache L-1.

Exhibit 12 is a special deliverability test reported on Form C-122-A for the Axi Apache L-3, and Exhibit 13 is a special deliverability test for the Axi Apache M-1, reported on Form C-122-A.

MR. PORTER: Thank you.

Q (By Mr. Kellahin) Mr. Mattes, do these well tests conducted in anyway indicate that the 60 pounds difference in pressure at various points in the line would make a difference in

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the ability of these wells to produce?

A Yes, they do.

Q Is that difference, in your opinion, based upon any reasonable operation of the line?

A No, sir, it is not.

Q So, on the basis of these tests, is it your opinion that Continental Oil Company, even though Southern Union Gas Company has taken steps to correct the situation, has not fully done so?

A They haven't fully resolved our problem for us, that is right.

Q And the pressure differential you are now suffering constitutes discrimination?

A Yes, that is my opinion.

Q Is there any other data gathered which leads to this same conclusion, Mr. Mattes?

A Yes, sir. The special compressor test data was used at some point in some graphs I have prepared for the six wells we ran the special deliverability tests on.

These graphs are shown as Exhibits 14 through 19.

The graphs are a plot of well production rate against the system pressure.

The special tests that we ran are represented by that point on each graph, with the highest producing rate. That is, they are one point on these graphs, and the point

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representing the special deliverability tests is the highest point, highest gas rate on each of these six exhibits.

Q These are the same wells you tested and the wells shown by arrows on Exhibit 1?

A That is right.

(Whereupon a brief off the record discussion ensued.)

Q (By Mr. Kellahin) Go ahead with your discussion of the exhibits.

A What these graphs are is a plot of the quantities of gas produced in Mcf's per day versus the gathering pressure in evidence at the well.

The data that they plot was obtained during the period August 1, 1971 through December 31, 1971.

It was during this period that we ran the six special deliverability tests, and as a result, these tests and the higher rates which they represent sometimes overlapped a month, and the data from these months was not plotted.

Rather what we did was take a month where there was stabilized flow in evidence, and used the volumes provided by Southern Union, and the pressures--the average pressures provided by Southern Union, to find these other two points.

Q You say volumes in pressure. Are those their reports to you on the basis of which they purchased your gas?

A That is right.

Q Now, are all these pressure points reasonably close in time?

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What period of time is covered by these?

A Yes, sir. The time that is covered by these points is the last five months of 1971.

You can see from these graphs that as you lower the gathering system pressure--and this is zero pressure--and you are on this last line out here it is the 500 pound system pressure at the well, why the quality of gas in all cases generally increases, and you will notice for some of the wells that the increase that this graph reflects is very large for small reduction, is ... relatively small reduction in system pressure. This is L-1.

Q What exhibit number is that?

A Oh, this is fourteen, produced 58 Mcf's. This is an average for a monthly flow period against an average system pressure of 273 pounds, but on our special compressor's '70 test when we had 177 pounds, it produced 167 Mcf, nearly triple the rate for a hundred pound reduction in system pressure.

The reductions are of the same order of magnitude as shown in J-2, which increased its production 46 Mcf for a pressure reduction of 20 pounds.

That is Exhibit 18.

These are substantial differences percentage-wise for not so substantial differences in the production system pressure.

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Q Now, just talking about Exhibit 14, would you tell us where you got the information for each of the three points on there, so the Commission can understand what we are talking about, actual operating pressures in two points?

A Yes, sir. This point came--this is the rate reported on the Form C-122-A that we have filed for the Axi Apache L-1.

Q That is the test?

A That is the test.

Q And the exhibit's here?

A That is right. That is the seven-day stabilized average flow rate test.

Q Which was witnessed by the Commission?

A Part of it was, that is right, and these two points came from production and pressure data provided by Southern Union to Continental on a monthly basis.

The rate shown is the average production for the well per day for those days it was produced.

Q Now, the point which is 58 Mcf at 273 psi or 70---

A 273.

Q 273. Was that after Southern Union installed and put into operation their additional compressor facility and looping?

A Yes, sir. That is why we selected the period August 1st to December 31, 1971 as the points we should plot to illustrate this point.

The 356 reflects the system pressure that was in

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evidence before the compressor and pipeline looping were installed in October.

This reflects the character of the well at some time after the looping and compression revisions were installed.

Q Now, that is true of all of the other exhibits on the board?

A Yes, except the--

Q Except what?

A The L-3.

Q L-3, exhibit number what is that?

A 17.

Q 17, and why did you not use the 2,3 point rather than--

A I felt there was something the matter with one of the points. It didn't fit reasonably on the graph.

Q So, the pressures shown on there are the pressures subsequent to--

A Subsequent to the compressor installation.

Q And your test?

A And my--the special test, that is right.

Q Now, these graphs would certainly indicate that Continental Oil Company can produce more gas against lower line pressures, would they not?

A That is true, in my opinion.

Q Now, Mr. Mattes, whether Continental produces more gas or less is not really the point of this hearing.

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Does this indicate that anybody else can and probably is producing more gas against lower line pressures elsewhere in the system?

A Yes, it does, in my opinion.

Q Where?

A The where is in the system, in the wells connected to the north trunk and west trunk Exhibit 5 and 6.

Q Where you have shown lower pressures?

A That is right.

Q And this difference is demonstrated by these exhibits; is this correct?

A Yes, sir, in my opinion that is true.

Q Now, you have got a line on there marked "theoretical allowable rate." What is the significance of that?

A Well, the theoretical allowable rate was coined to describe the allowable that we calculated for each of these wells, using the Commission acreage and deliverability factors for the month of November, 1971, assuming that in fact these wells were proratable.

I might also add that the change that would be caused by going through the allowable calculation and readjusting the whole thing by not including these wells as non-marginal would be infinitesimal. We didn't go through and make these theoretical allowables. It does not reflect the total allowables as the Commission would do. It just took the

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Commission acreage and deliverability factors and applied them to the deliverability and acreage factors for these wells.

I guess the best way to say that is that any difference between the theoretical allowable, as we have calculated it, and the allowable that would be assigned these wells after modifying the entire allowable calculation by including Continental's wells as non-marginal, would be infinitesimal.

Q Now, assuming then that your theoretical allowable is an allowable that would have been assigned to these wells, had they been proratable wells, how many of the non-marginal wells under the present existing system are there?

A Five of them.

Q Now, your Exhibit No. 19 showing the 0-1 well shows actual reduction in pressures against--I mean actual reduction in production against lower pressure; is that right?

A That is right.

Q Can you explain that?

A No, sir, I can't, but the points were so reasonably close together that I couldn't reasonably exclude one without excluding the other, so I plotted them both.

Q You wanted to show the effect on all six of the wells you had tested?

A Yes.

Q So you included them?

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A That is exactly right.

Q You have shown graphically the result of the reduced pressures on six wells. How many wells does Continental own in that Pool?

A Thirty-one.

Q What would be the effect of reducing pressures on the other wells?

A The effect of reducing pressures on all of the other wells is to increase their producing rate.

Q Producing rate. The actual reduction that has been made by Southern Union Gas Company has resulted in increased production, has it not?

A Yes, it has.

Q Of the 31 wells, how many would have produced the allowable had they been assigned after this reduction in pressures? They were classified as marginal, were they not?

A That is right.

Q You have calculated what an allowable should be for these wells?

A Yes.

Q Of the 31 wells, how many actually produced that volume after Southern Union Gas Company reduced its line pressures?

A I have forgotten the exact number, but it is twelve or thirteen.

Q And those wells then properly on commission records should

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today be classified as non-marginal proratable wells, should they not?

A That is right.

MR. PORTER: In other words, those 12 or 13 wells actually produced above these theoretical allowable lines, had that calculation been made.

MR. KELLAHIN: That is correct.

MR. PORTER: Since reductions in line pressure---

THE WITNESS: Yes, sir, that is right, if you calculate the theoretical allowable for these 12 or 13 wells and compared its production since the line pressures have been reduced to that theoretical allowable line, that production would have been higher than the theoretical allowable line.

Q (By Mr. Kellahin) If the line pressures were further reduced to equalize pressures with the north segment of the system, is it reasonable to believe that other wells would be proratable wells?

A Yes, sir, it would.

Q Do you have any idea how many?

A No, sir, I haven't, I have not.

Q That would have to be on the basis of experience?

A Yes, sir, that is right.

MR. PORTER: Let me ask this question at this point: Would it have allowed an increase in production of some of the wells which would not have become non-marginal?

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THE WITNESS: Yes, sir. You will notice in reply to your question, if I may, please, that our one well that never got to the theoretical allowable rate is Exhibit 16, marginal allowable by any standards, it is M-1.

We had 424 pounds. It produced 20 Mcf a day. When we reduced the system pressure to 273 pounds, the production rate is down to 38 Mcf a day. A couple of days we reduced it to 70 pounds. It went from 38 to 56. So, what can you say, that is if you reduce it in--this is the actual pressures that is in evidence at this well today--if you reduced it 60 pounds, this well would probably have a marginal allowable somewhere between 38 and 56, and it would be higher than the 38, but less than the 56. That is the marginal well.

Q (By Mr. Kellahin) Would you say that a marginal well is being discriminated against by high line pressure in this system?

A Yes.

Q Mr. Mattes, you have discussed increases in production that resulted from reduction in pressures in Southern Union's system.

Have you prepared another exhibit to show this?

A Yes, sir, I have.

Q Would you identify Exhibit No. 20 and discuss the information shown on it?

A Exhibit No. 20 is a plot of the production by month for the years 1970, and eleven months of 1971 for all of the wells

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that we have discussed, the 119 of the allowables schedule that we filed as Exhibit 3, and their total production, as reported in the Commission reports is shown on this draft by the dashed line, connected with circles.

You can see on this plot the reduction and increases in the system volumes that are caused by seasonable variations.

You will notice the low producing rates are in the warm months of the year.

The high production rates are in the cold months of the year.

Now, as part of this total production I have also plotted that tract that is represented by the Continental Axi J, C, L, M, N, and in the 0 leases.

They are shown by the solid line at the bottom.

You will notice that in October and November of 1971 the rate tolerated for Continental wells is higher than it has ever been for the nearly two year period that this graph covers.

Now, because of the system volume is so large, even though we try to compress this calculation by leaving out a piece of it here, why the effect of this large scale is to kind of mask, I think, the magnitude of the effect of the change that the pressure reduction we have experienced has indicated, because September's actual production before the change was made totals 38,007 Mcf's; October's production is

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58,606 Mcf's, and 71,963 Mcf's in December, and to more clearly reflect the magnitude of this change, I replotted the same data on different scales. They are Exhibit 21.

The point I have made about the production increase is more dramatically illustrated by these graphs. The numbers that were used to plot this graph have the same identical numerals on Exhibit 20.

They just show more clearly how much higher the total production rate for Continental's wells was in November than it was at any other time in this two-year period.

Q Now, your Exhibit No. 21, to which you were just referring, is a little bit confusing.

Would you explain the difference between those two lines? They are not based on the same scale?

A No, they are not based on the same scale, you are right. The dash line which is the same line as the dash line over here, that reflects the total production of the South Blanco-Pictured Cliffs Pool wells connected to the Dogie Canyon Compressor Station against the production volume shown by this axis.

The Continental volumes, which are again the solid lines connected by the triangle, are measured by the progress volume shown on this line.

Q Now, those exhibits would seem to indicate that Continental has done better than the other wells in the system; is this

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true?

A Yes, that is true, in my opinion.

Q They have done better since they reduced the line pressure?

A Yes, that is right.

Q How can you account for that?

A How can I?

Q Was there a greater degree of discrimination against Continental?

A Yes, the reduction we enjoyed was greater than the reduction that was enjoyed by the other wells that are producing into the same pool.

Q Does that account for the reason?

A Yes, sir, it would.

Q The difference?

A Yes, sir, it would.

Q To what extent does this reflect seasonal changes, Mr. Matt-es?

A Well, it just shows the seasonable variation in systems are evident. They produce less than the wells, the wells produce less, the system takes less gas in the system than it does in the cold months of the year.

Q This was designed to show the picture for the entire system?

A The picture for the entire system and before the change was instituted, we had the same seasonal swing in 1970 that we had in 1971, but with the 400 pound plus system pressure in

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evidence, Continental's wells did not enjoy the same production increase that they enjoyed after the line pressures were reduced in October.

Q And subsequent to October has Continental enjoyed the largest production it has ever had in this pool?

A I do not know that to be a fact.

Q It has certainly enjoyed the largest production it has had in 1970; is that correct?

A Right.

Q And '71?

A Right.

Q Now, on the basis of these two exhibits, what conclusion do you reach, Mr. Mattes?

A On the basis of these two exhibits, I'd say that prior to September and going back through the month of December, 1971, Continental wells have been certainly unreasonably discriminated against.

Q Does that exhibit indicate that Continental wells are in fact capable of producing against the same pressures and on the same basis as other wells in the system?

A Yes, this is a fair reflection.

Q Now, in your opinion, are the transportation facilities furnished Continental Oil Company substantially the same or equal to the facilities afforded other operators in the pool?

A No, sir, they are not.

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Q And does the quality, the quantity and pressure of the gas available have any relationship to this discrimination you say exists?

A No, sir, it does not.

Q Is there any difference in quality of the gas pools, to your knowledge?

A No, sir, there is no big difference in the quality of the gas in the pool. In my opinion, it is a common source of supply, and while there may be some infinitesimal small variation from place to place in the reservoir, it is nearly identical gas.

Q Now, return to what has been marked as Continental Exhibit No. 22. Would you identify that exhibit?

A Yes, sir, Exhibit 22 is a comparison of theoretical allowable and actual production by operators of the various operators in the pool and system we are discussing here.

The first column shows the theoretical allowable for all of the operators for the period of February through November, 1971.

Q Now, how did you arrive at this theoretical allowable?

A We did the same way for this calculation that we did in Exhibits 14 through 19.

Q And did you treat all of the wells in the pool then as being non-marginal wells?

A That is true.

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Q You assigned an allowable to every well in the Pool?

A That is correct.

Q On the basis of this comparison?

A That is right.

Q Would you go ahead with your discussion?

MR. PORTER: Were you using the nominations as stated to the Commission by the purchasers to make these theoretical calculations?

THE WITNESS: That is exactly right.

MR. PORTER: Did you use factors which were used by the Commission in assigning allowables?

THE WITNESS: Yes, sir, I did. The acreage and deliverability factors, and then the acreage and deliverability from the 1970 Annual Engineering Reports for the wells that each operator had.

MR. PORTER: Did you use the factors which the Commission utilized?

THE WITNESS: Yes.

Q (By Mr. Kellahin) Would you go ahead with your discussion of the Exhibit?

A O.K. And the second column shows the actual production for the same months. That is the total production for each of the six operators in this Pool for the period February through November, 1971.

The numbers shown represent the total production from

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the Commission's own records of each of these operators.

The third column is that percentage of the first column or the theoretical allowable that the actual production or the second column represents.

For example, the 89.43 percent shown in the third column for Caulkinswells is the ratio, the percentage ratio of 1.209 billion to 1.352 billion.

It is the percentage of actual production expressed as a percentage of theoretical allowable, and we have done this for each of the six operators in the Pool and pooling system.

Q Now, the fourth column indicates what?

A The fourth column denotes which trunk system, as we have identified on Exhibits 5 and 6, these operators produce into, and you will notice that the highest percentage of production is the percent of theoretical allowable attributable to these wells in the north and west pipeline trunk systems.

The guys at the bottom of the list, including Continental Oil Company, all produce into the east trunk system where the gathering system pressure is higher, and the plain fact is that the differencesbetween these wells are simply not as great as this percentage production of theoretical allowable would indicate. They just aren't that different, in my opinion.

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I am certain, based on the things that I have done here, that substantially the same gathering facilities were provided to all six of these operators, including Continental Oil Company, that the wells in this common source of supply would not show the percentage difference that is evident on this exhibit.

Q Well, is there a substantial difference or even a difference justifying the difference in pressures based on quality, quantity, and pressure of the wellsin the South Blanco-Pictured Cliffs Pool in the various trunks of this system?

A Would you repeat that again?

Q Is there a difference in the quality, quantity, and pressure of the gas in the South Blanco-Pictured Cliffs Pool that would justify a difference in the gathering facilities afforded?

A No, sir, there is not, in my opinion.

Q How long will Continental Oil Company's gas be available to Southern Union?

A Under the present contract, I think it has a termination expiration date of 12-31-75, or 1-1-76.

Q The quantity of the gas available for sale indicated by the deliverability is calculated by the Commission formula, is it not?

A Yes.

Q Are there substantial differences in deliverability in

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wells in this Pool?

A No, sir, they are not.

Q There are differences, of course?

A There are differences, of course.

Q Mr. Mattes, you understand that Continental cannot demand this Commission or ask this Commission to set any given line pressure, do you not?

A Yes, that is right.

Q You are not asking them to do that?

A No, sir, I am not.

Q You have indicated that Continental Oil Company could produce greater quantities of gas against lower pressures?

A Yes, sir.

Q What is the real purpose of showing this increase in production that could have made the difference in production?

A The point is that if the facilities that were afforded our wells were substantially the same as those afforded other operators, our wells would produce substantially more gas.

Q Now, if on the other hand line pressures were increased or other segments of the system through it to the same as those against which Continental Oil Company is producing, would that accomplish the purpose we are seeking here?

A Yes, sir, it would.

Q That would give us substantially the same opportunity?

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A Precisely.

Q In your opinion, if the line pressures are not adjusted to a substantially equal basis, will there be premature abandonment of Continental's wells?

A Yes, if the 60 psi differential that I have testified is in evidence today is allowed to exist to abandonment of the well, then certainly some of the Continental Axi Apache wells and those of some other operators in the area will certainly be prematurely abandoned.

Q Would that constitute waste in your opinion?

A Yes.

Q Will the correlative rights of Continental Oil Company be adequately protected by the Commission proration system as operated by Southern Union Gas Company?

A No, sir, they would not, in my opinion.

Q Is the basis of this difference substantially the difference in line pressures?

A The basis of the difference is substantially in the line pressures that are in evidence at our wells.

Q Now, we have talked about substantially equal line pressures. Is it possible to obtain equal pressures throughout the entire system?

A No, sir, and I think I recognize that.

Q Now, you have testified that the nearest wells from the compressor station to the wells to the north is approximately

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three miles, and to the wells on the east Continental wells, is approximately four miles?

Q What kind of pressure differential would you consider to be reasonable and proper on that basis?

A Off the record, should I get our Exhibit 5?

MR. PORTER: Mr. Kellahin, how much longer do you anticipate you will take with your direct examination?

MR. KELLAHIN: Very short, about five or ten minutes.

MR. PORTER: I want to give the reporter a break as well as the Commissioners.

MR. KELLAHIN: We can finish with this witness in about five minutes.

MR. PORTER: Let's proceed then.

MR. KELLAHIN: If you want to take a break, we will be happy to.

MR. PORTER: I think we can conclude and then make the witness available for cross examination.

Go ahead.

Q (By Mr. Kellahin) Would you go ahead and refer to the exhibits? Discuss the question I have asked.

A May I have the question repeated, please?

Q What pressure differential would you consider reasonable to the wells in the north segment of the system as compared to those to the east, the closest well I am talking about?

A Well, for the facilities to be substantially the same, the

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pressure at a point three miles from the Compressor Station ought to be in evidence at a point three miles from the Compressor Station on the east trunk.

There might be a pound or two difference to go the other mile, but there are no intervening wells in either of these systems, so in order for the east trunk to be provided facilities which are substantially the same as those available to the well connected to the north trunk, we would like to have the pressure here, it ought to be at the order of 189 pounds. I recognize it might vary five to 10 pounds, and in fact does on this system.

Q You would not anticipate that same pressure to be available to you at the end of your system on the east side, would you?

A No, sir. In order for gas to flow into this system you have got to have a hydraulic gradient. The pressure that is available here would be increased to the end of the system by the hydraulic gradient that is in evidence here.

Q That would still constitute ratable taking, in your opinion?

A Yes. The facilities then would be substantially the same. There is a hydraulic gradient from here around to here.

There is a hydraulic gradient from here around to here, and the wells that would produce into these comparable systems then would be producing ratably.

Q There is a hydraulic gradient to the Southern Union wells

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on the west portion of the system?

A That is true, sir, there is.

Q Would the gradient be approximately the same as to your easternmost well?

A Let me check. Yes, the gradient is about the same. It is further, but there is more pressure, sir.

Q So, properly Southern Union well could be producing against about the same pressure as your easternmost wells?

A Southernmost wells, yes.

Q Are they in fact doing so today?

A No, sir.

Q What is the approximate difference?

A The approximate difference is 42 pounds. The northernmost well of Southern Union Production Company in 27-8, which is the Nafajo Indian 2-P had a pressure of, on January 18, of 250.

Conoco's Axi Apache L-1 had a pressure on that same date in Section 36 of 25-4 of 292 psi.

Those pressures, by the way, are absolute.

Q Mr. Mattes, were Exhibits 1 through 22 prepared by you or under your supervision?

A Yes, sir, they were.

MR. KELLAHIN: That completes the direct examination.

(After recess.)

MR. PORTER: The hearing will come to order, please.

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Are there any questions of the witness?

Mr. Morris?

CROSS-EXAMINATION

BY MR. MORRIS

Q When did you first become acquainted with the production in the San Juan Basin? Well, in your work?

A In my work, in March of 1971.

Q March of 1971?

A That is right.

Q What has your work in the San Juan Basin consisted of since that time?

A My work in the San Juan Basin has been related to the Apache J, K, L, M, N, and O leases and their relationship to the Southern Union gas system which serves them.

Q Are you familiar with any other producing horizons, namely the Dakota, Mesa Verde, or any other formation?

A I know of them, but I am not familiar with them.

Q Are you familiar with Pictured Cliffs production in any other Pool other than the South Blanco?

A No, sir, I am not.

Q How much time have you spent in the field in the San Juan Basin since March of '71?

A I made two trips to these leases, that I can recall. I have made numerous trips to Casper, where the Continental office is that supervises production of these wells.

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Q Does Continental have an office in New Mexico in the San Juan Basin?
A Yes, sir. They don't have an office. They have a field production superintendent.
Q Do you have any engineer or geologist actually located in the San Juan Basin or the Rio Arriba Basin?
A They only come to the Basin on an intermittent schedule.
Q In connection with the work that you have done on this particular matter, how many well logs have you personally examined?
A Oh, about eight or ten.
Q Eight or ten?
A Yes.
Q Are those all on Continental's wells?
A Yes.
Q Have you examined any logs at all from any of these other producers in the South Blanco-Pictured Cliffs Pool?
A No, sir, I have not.
Q Have any of the wells been cored on the wells that you have examined the logs on?
A Yes, sir.
Q Have you examined the cores?
A I have looked at them briefly, yes, sir.
Q How many of them were cored?
A There was five wells that were cored.

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Q Five of the six wells that you have, you are talking about?
A No, sir, five--some of the wells that were cored may be the wells that we are talking about that are reflected in Exhibits 14 through 19, but the five wells that were cored, I do not remember exactly, but I do not think they are represented totally in this six wells.
Q Were those wells that were cored, were those wells drilled by Continental or by Humble?
A I really can't tell you. I don't remember.
Q How did you happen to pick the six wells that you did the log examination on, just at random?
A Just at random, yes, sir.
Q You did not examine the logs on the six wells that you have used in your comparison of production rate versus pressure?
A No, sir.
Q Now, when you were in the field, did you, when did you say you were in the field?
A I testified that I was in the field in late May and early June on one trip, and then I made another trip out some time during that time when we were running these special deliverability tests to observe how the wells were connecting up and to see how the compressor and the wells were relating to Southern Union's line.
Q Are you familiar with the background of this area, and particularly the tract that the Continental acreage that

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you have shown on your Exhibit No. 1 formerly was owned by Humble?

A I know vaguely of it in general terms, but as to the specifics of how and when it became Continental acreage from Humble acreage, I do not know the exact answer.

Q Do you know when Humble first drilled its wells in this acreage?

A No, sir, I do not.

Q Do you know how many wells Humble drilled?

A I don't believe I know that number.

Q You testified there are now 31 wells operated by Continental on these leases in the South Blanco-Pictured Cliffs Pool?

A Yes.

Q You don't know how many of those Continental drilled?

A No, sir.

Q When was the first well drilled on this acreage?

A I don't know that.

Q Do you know whether any initial pressures were taken when that first well was drilled?

A Initial pressures?

Q Initial reservoir pressures?

A Do I know if any ones were taken?

Q Yes, on the first wells drilled by Humble, your predecessor in interest in these wells, were any pressures taken?

A I am sure there were some taken, yes.

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Q Do you know what they were?
A Do I know what the original pressures were on the original Humble? I do not know precisely.
Q What ever studies you have done on this area you have not seen fit to go back and look up that original pressure information; is that correct?
A We looked at the original pressure information, but I do not remember precisely what those pressures were.
Q Do you know what the original line pressures were on Southern Union's system at the time that Humble connected to this system?
A No, sir, I do not.
Q Have you made any attempt to investigate the working pressures, working line pressures of the wells that were connected to the various trunks of Southern Union's Gathering System in this field, going back to the time when the wells were first connected, and down through the years, have you made any study of that?
A No, sir, I did not. The only studies I have made of the pressures that were evident in the Southern Union's lines are reflected on the pipeline map exhibits, and I believe their number is 5 and 6, that I presented in evidence here today.
Q You are familiar, aren't you, Mr. Mattes, that Continental did take over these wells from Humble; the acreage was

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Humble's acreage, and that Continental has acquired these lands that used to be Humble lands, some of these wells used to be Humble wells?

A Yes, my understanding, although I did not testify to this, is that the wells passed from Humble to Arizona Exploration, and we acquired the properties from Arizona Exploration.

Q Approximately when was that?

A I can't tell you.

Q You don't know?

A I don't know.

Q You don't know what the working pressures in the Gathering System line was at the time you acquired it from Arizona Exploration?

A No, I do not.

Q Mr. Mattes, are you familiar with the gas pressure agreement that covers this acreage?

MR. KELLAHIN: We object to any question on the purchase contract. It has no bearing on this case.

The Commission can't pass on the terms of the contract.

We are here under the Statutes and Rules and Regulations of the Commission, which we are asking be enforced. The contract has nothing to do with this.

MR. MORRIS: If the Commission please, I think that Mr. Kellahin has raised an objection which was not wholely unanticipated here, but it is one that is without merit in this

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case.

We are not, of course, asking this Commission to pass on any contract.

What we intend to do when it comes to our part of the case is to present that contract to get all of the information concerning this field out on the table for the Commission to see, but we are not asking you to rule upon whether, on what some particular contractual provision means or whether there has been a compliance with the contract, or anything of that sort.

What we intend to go into, both in our case and here on cross-examination, is the proposition that the prices paid under the contract, and I am talking about the original contract with Humble to which Continental has now succeeded, is a factor that this Commission should take into consideration, because it will show that the prices that are being paid to Humble--prices being paid to Continental are above the prices that are being paid to other producers in the field, and that this price is related to the pressure differential that exists.

We feel that this is a very important consideration to place before the Commission, and we believe that Continental's case is fatally deficient here for not having recognized this price pressure differential. We want to explore that on cross-examination of this witness.

MR. PORTER: Mr. Morris, the witness, I believe, only testified to what he thought was the duration of time for this

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contract. As I recall, he thought it would go through 1975. He didn't testify to other aspects of the contract, so the Commission will sustain Mr. Kellahin's objection unless you develop this testimony, this testimony through your own witness.

MR. JASON: At which time we will renew our objection. You are not ruling on the admissability, I take it?

MR. PORTER: No. No. If he wants to go into that, he can present it at that time for the Commission's consideration.

Q (By Mr. Morris) Aside from the contract, Mr. Mattes, are you familiar with the prices that Continental has actually been paid for its gas as being purchased by Southern Union?

MR. KELLAHIN: There again, we would object to this line of questioning. We are here under the provisions of the Common Purchaser Act. Price--the only thing that price has to do with this is an operator is forbidden to discriminate on the basis of price.

We are not arguing they discriminated on the basis of price. We say they have discriminated on the basis of the facilities afforded, and the Statute says that it shall not constitute unreasonable discrimination if such differences bear a fair relationship to different qualities, quantities or pressure of gas available, or the length of time during which it will be available to the purchaser.

Those are the factors the Commission can consider, and price hasn't anything to do with it.

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MR. MORRIS: Mr. Porter, I think that Mr. Kellahin skipped over a couple of words when he just read the Statute to the Commission. It says, "For the purpose of this Act, reasonable differences in prices paid or facilities afforded or both shall not constitute unreasonable discrimination if such differences bear a fair relationship to the differences in quality, quantity, or pressures of gas," etc.

It is our position that differences in pressure, differences in price, differences in quality, although I don't think that is a very important feature here--differences in quantity of gas available, and differences in the relative length of time the gas is available, are factors which must be considered by this Commission in determining on balance whether there has been any unreasonable discrimination. Our point here is the price that it is common practice, at least in this field, and we would submit in gas purchase contracts just generally, for price and pressure to be interrelated, and to come in here and talk about, want to talk about pressure but not want to talk about price is asking a man to fight with one hand tied behind his back, because the two are interrelated.

MR. PORTER: Mr. Morris, of course you made that clear in your opening statement as to the factors that should be considered, and it is there in the law.

However, I think the Commission will sustain the objection on the same grounds that we sustained the first objection, that

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is that the witness has not testified to price.

I realize that there is a fine line of differentiation here, but the fact remains that he has not testified as to price.

MR. MORRIS: All right, Mr. Porter. I understand your ruling that we simply are precluded from asking questions about price because this witness has not testified to it, and not on the grounds that it is not relevant to the proceeding?

MR. PORTER: Well, at this point in the hearing, relevancy may be argued to a greater length at some later point in the hearing. I am satisfied it will be.

Q (By Mr. Morris) What is Continental actually seeking by this Application; what kind of an order is that you are asking the Commission to order specifically?

A The language, I guess, can best be summarized by the words "substantially the same," as we are seeking substantially the same Gathering System pressures to be in evidence at our wells as are in evidence at other wells on other trunks.

Q Are you asking the Commission to enter an order that would require Southern Union to establish, to change its system to make expenditures so that its pressure at your wells would be substantially similar to the pressure at a given point on another trunk line?

A Mr. Morris, I haven't testified on a specific order that we would suggest to this Commission, but the language it would contain if we were to draw up such a recommended order

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would contain the words substantially the same facilities as I have described them to you.

Q And you would ask the Commission to provide substantially the same facilities without regard to consideration of price, quantity of gas, length of time that this gas is available to the purchaser; is that correct?

A I would ask the Commission for substantially the same facilities for gas of like quality, quantity, and the pressure at which it was available, and the length of time.

Q That is to all producers in the Pool?

A To all producers in the Pool.

Q This is also as to all producers in pools connected with the Southern Union system?

A All producers in the pool and system that I have testified to in my testimony here today.

MR. PORTER: Are there any other purchasers in the pool?

MR. MORRIS: Yes, Mr. Porter. The El Paso Natural Gas operates a gathering system in this same area.

MR. PORTER: That is just for my information. Thank you.

Q (By Mr. Morris) Do you know how many wells are connected to the Southern Union Gathering System total number of wells in this pool?

A In the South Blanco-Pictured Cliffs Pool?

Q Yes, Exhibit 3 shows 119.

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A That is right.
Q How many of those wells are classified as non-marginal wells?
A All of Continental's 31 wells. All of Mr. J. R. Abraham's too, and all of Aztec's that are in--
Q I think your answer was the number of the wells that were marginal; is that right?
A Pardon?
Q I asked the question how many were non-marginal?
A How many were non-marginal I do not know. We have no non-marginal wells. Mr. Abraham has no non-marginal wells.

In those sections wherein we have a common interest with Aztec Oil & Gas, all those wells are--don't have a proratable allowable assigned. Beyond that, I can't tell you. I can look at Exhibit 3 and summarize it for you, if you would like.

Q Of these 119 wells, did you say?
A Yes, sir.
Q Are any of these wells presently shut-in?
A I don't know that.
Q Has Continental ever considered installation of compression facilities on its properties to boost its gas into the gathering system of Southern Union?
A I haven't so testified.
Q I am asking you now if you know has Continental ever

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considered this, to your knowledge?

A Why certainly we have, but I had not testified to that, except on cross-examination.

Q Does Continental have any plans at this time for installing its own compression facilities?

A None that I am aware of.

Q If Continental installed its own compression facilities, would this afford it the opportunity of producing gas into the Southern Union line at whatever working pressure you choose to create?

A Yes, if it lowered the wellhead back pressures, if a compressor installation would lower the wellhead pressures, yes, sir. Such a compressor, if installed by Continental would increase their production rate.

Q It is a function of cost to Continental, is it not, as to whether you would do that?

A No, sir, it is not a function of cost totally whether we do this or not. I take that back. Yes, it is a function of cost totally, but to install such a compressor on our leases to service our own wells would require substantial looping of facilities already in place that are in fact the property of Southern Union Gas Company.

Q The cost of installing facilities, compression facilities could be directly related to and amoritzed over a period of time and be expressed as a reduction, if you will, in price

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received for your gas, could it not?

A Yes, that is just simple arithmetic.

Q Are you aware of any studies that have been made by your company as to what that price reduction would be?

A I have looked at the studies, but I am not aware of the price reduction, as you have put it, what that number would be.

Q You testified as to the term of your contract with Southern Union as expiring, that the contract will expire on December 31, 1975, I believe.

A I believe what I said exactly is December 31, '75, January 1st, '76, that is right.

Q Have you investigated the terms of the contract that Southern Union has with any other producers in this field?

A No, sir, I didn't. I didn't feel--no, I did not. I was not privy to the information.

Q You did not seek that information out?

A I did not seek it out.

Q You are not then able to testify as to the relative length of time during which gas from this Pool would be available to Southern Union Gas Company through this system?

A Beyond the statement that I have made, no, I am not.

Q Mr. Mattes, let me turn to your testimony concerning the production tests that were taken using your own compression facility.

When were these tests taken?

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A These tests were taken in September, October, and November of 1971.

Q How many wells were tested?

A Six.

Q How were these wells selected?

A Randomly.

Q Who were they selected by?

A Our Casper office, who also supervises the direct running of the tests.

Q What type of compression facilities did you install for these tests?

A Single stage compressors, skid-mounted, portable.

Q Portable units?

A Right.

Q What horsepower rating?

A I think when we started we had a 35 and a 50, and one of them didn't perform very well, and we got rid of it. We only used one of the compressors for most of the tests.

MR. PORTER: Gentlemen, let's break the cross-examination at this point and recess the hearing until 1:15.

The Legislature is in town, and they are usually hungry. Let's try to beat them to the restaurants.

(Whereupon the hearing was recessed.)

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MR. PORTER: The hearing will come to order, please.

MR. MATTES: Mr. Porter, if I may, I would like to correct the record of some testimony that I gave this morning. I believe I testified that, in answer to a question, horsepower of the compressors that were used in the special deliverability tests as shown in Exhibits 8 through 13 was 35 and 50 pounds, and I have looked at my notes and they reflect that the compressor I actually saw in the Field was Minneapolis-Moline with a nominal 60 horsepower rating derated to a 35 horsepower for this application.

MR. PORTER: The record will reflect the correction in the witness' testimony.

MR. MORRIS: Before we continue with our cross-examination, I see we have a visitor who once was a very frequent participant in our hearings up here, and I have been wondering since he came in what interest a potash company attorney had in a ratable take case on gas. Anyway, Roy, we are all glad to have you here.

MR. ROY BLACKBURN: I was just wasting a

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little time.

MR. PORTER: Mr. Morris, you may proceed with your cross-examination.

CROSS-EXAMINATION
(CONTINUED)

BY MR. MORRIS

Q Mr. Mattes, you have testified over the three month period during which these special tests were taken. Can you tell me the dates on which the tests were taken for each of those wells?

A Sure, I can. They are shown on the exhibits, if I may have them, please.

The date of the flow test for Apache J-1 was October 18 to October 26, 1971, and the shut-in pressure for this well was measured on November the 1st.

Q Excuse me, Mr. Mattes. I didn't realize that you had that shown on the exhibits. I won't ask you to read those off.

Let me ask you this.

Are you familiar with the provisions of the New Mexico Oil Conservation Commission Order 333-F which sets up the procedure for taking the deliverability tests in the San Juan Basin and in particular for this Pool?

A Yes, sir, I am.

Q Are you familiar with the provisions of that order which requires that a conditioning period of 14 consecutive days of production precede the taking of the deliverability tests?

A Yes, I am.
Q Now, were these wells conditioned in that manner? Were the compressors installed before the test was taken?
A Yes, sir, they were, to the best of my knowledge.
Q In other words, counting the 14 day preconditioning period and the 7-day test you would have a three-week period there?
A Of flow, that is right.
Q Of flow. Were the compressors installed?
A Installed, that is right.
Q Now, do those dates reflect on your exhibit that you have submitted to the Commission?
A Not only those dates that the flow test was actually in progress--they are reflected on our exhibits, and the dates of the shut-in are reflected, and the date of the flow period for the test is shown on the form.

The date of the shut-in pressure, as measured, is also shown on the form, and the two week pre-flow periods, or the two weeks preceding those dates that the flow tests are shown on these exhibits.

Q Do you have the production rates that were experienced by these wells during the pre-flow period?
A No, sir, I don't.
Q Do you know how they compare to the flow rate that was shown on the seven day test?
A Yes, I do. I have a general idea.

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That general idea is that at the start of these pre-flow periods the rates at which these wells produced were substantially higher than the stabilized flow rates that are reflected in the Q's of Exhibits 8 through 13.

Q Now, you have referred several times to the flow rate as being a stabilized rate, but I think that your testimony with respect to this matter was that you used an average flow rate for the seven day test; is that correct?

A That is right.

Q Do you have the beginning and ending of the flow rate for these wells for that seven day test?

A No, sir, I do not have them here.

Q You don't have them available?

A Not with me, no, I don't.

Q Would it be a fair statement, Mr. Mattes, to say that the rate of flow at the beginning of the seven day test was substantially higher than the flow rate at the conclusion of that seven day test?

A The perspective I would put on that question that you have asked me is this: It is indeed a fact in all wells when we run a deliverability test that the rate at which the well produces does decline during the stabilized flow period because, in fact, the pressure is going down in the reservoir, and the difference between the pressure on the first day of the stabilized flow test and the difference in the

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pressure on the last day of the stabilized flow test is, in some cases, could be very small, but the difference still exists.

As far as the substantially higher language that you have asked me about, I do not think that these rates were substantially different between the beginning and the end of the flow periods that are recorded on these exhibits.

There were some differences and I would admit that to you handily.

Q Have you examined the charts taken from these wells during the seven day flow test?

A No, sir, I haven't.

Q You haven't?

A No, sir.

Q Were they available to you?

A Yes, they were.

Q On the last day of the test was the flow rate still declining compared to the rate that the wells had experienced during the preceding six days of the test?

A I can't tell you positively. I would suppose that they were, yes.

Q In the language that I just--if they were, you can't very well say that is a stabilized flow rate, can you?

A I neither said it was a stabilized flow rate or not a stabilized flow rate.

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The stabilization I have used in describing these tests as we have run them, are the descriptions the Commission describes to the method of running these tests.

The method that we use is clearly defined by the Commission.

These tests were run by the same people who run the annual deliveraability tests that Continental Oil Company submits to the New Mexico Oil Conservation Commission for allowable purchasers, and the definition of these flow rates in these tests is, as we have introduced them here in evidence, are stable within the context of the way the test was run and the definition of the Commission.

Q Were you present during the time any of these tests were run?

A Yes, I was. As a matter of fact, the day I was there was November 2, 1971.

Q Which well--never mind.

Was any water being produced in connection with these tests?

A I really don't know.

Q Are you familiar with the fact that many of these wells do produce water?

A Yes, sir, I am. Many, in that context, I know there are some wells that produce water, yes.

Q You have a water problem in connection with your production on some of these wells?

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A On some of these wells?

Q Well, some of your 31 wells?

A O.K. Can you define "water problems" for me so that I can answer your question?

Q Yes. Do you have the situation in this pool with your wells, or some of your wells, that the well will load up with water to the point that production, or the production rate is impaired?

A Oh, yes, we do.

Q How do you remedy that situation; how do you handle it?

A We blow them down.

Q You blow them down. You blow them down annually?

A I really don't know. I would suspect so.

Q Do you have intermitters on a great many of these wells?

A I am trying to remember, but I don't remember exactly, no, sir. I couldn't attest to the intermitters.

Q Do you know what size tucks you have in your wells?

A Yes, sir, in the--the tuck sizes are all shown on your C-122-A's.

Q Were any of these tests, deliverability tests, interrupted due to water problems?

A I can't testify to whether they were or were not.

Q Could you agree with me, Mr. Mattes, that if a well was having water problems during a period of ordinary production that the producing rate for that well would not

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be comparable to a producing rate, let's say during a period of high flow such as you have presented here for these special tests?

A You are talking about a general well; is that right?

Q Yes. Just in general. I am not relating this to a specific well right now.

A If a water well gets water, its flow rate will be--yes.

Q In comparing the results of your special tests here, at a high rate of production you would necessarily need to know, would you not, whether the well was the rate, the previous rate against which you are comparing it, was whether the well had been properly blown down, was free of water--

A Precondition?

Q At that time?

A Yes, I think I would agree with that.

Q In other words, you would have to look back at a time when the well had been preconditioned in approximately the same manner?

A Let me see if I understand the context of the question. What you have asked me is if a well loads up with water, its production rate will be reduced, and I have answered generally that is true.

Now you have asked me what precisely in addition to that--

Q What I am saying is you have made a comparison of a flow

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rate on a production test back against a flow rate taken at some other time, and my question of you is: In order to make that comparison meaningful, don't you have to know the condition of that well at the time the previous flow rate was tested?

A Yes, sir, and the way I would have to put the time frame respective to this reply is that all of the production data that I have testified to about the six wells that we ran our special deliverability test on was over the minimum period wherein we could reasonably extract what I considered to be stabilized flow rates, and the data that is on our Exhibits 13, 14, through 19--excuse me--all of that data was acquired during the period August 1 through December 31, 1971, and it was for the reason your question suggests, that we prepared these exhibits in this way, in addition to being current data, and to present them in a gross context of section tests over a three month period.

Another way to have accomplished the same thing would be to have set these rental compressors out there and let them run on a sustained basis until a stabilized flow rate was achieved, but the fact that this problem has carried on for so long that Continental was eager to get the results of these tests as quickly as possible.

We used the deliverability formula and the flow procedures of the Commission to arrive at data which we fel-

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was reasonable.

Q Mr. Mattes, this compressor that you used, which had a rated capacity, I understand, of 35 hp?

A Yes.

Q Now, that was really more compression than you needed to perform these tests on the rates of your production; is that correct?

A Mr. Morris, the number of factors that go into the proper sizing of compression for a given application are many.

Q Let me just ask this, Mr. Mattes.

A Yes.

Q During these tests you actually had an, you had an excess capacity, so that some of the gas being produced had to be recycled back down your casing, did it not? In wells from which your test was being run?

A It wasn't on the well I looked at.

Q Was this the situation with respect to any of the wells on which these tests were run?

A Mr. Morris, I did not witness every one of these tests, and I would certainly think it would have been advantageous f me to have been there during the total time that they all were run.

Continental field personnel have been in the Basin for a number of years and are familiar with the procedures required for running deliverability tests.

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I would hope that they did not do what you suggested, but because I was not there and did not question them specifically about it, I cannot reply negatively. I can only reply negatively with regard to the wells that I witnessed.

If I may be permitted a parenthetical addition to my reply to your question, Southern Union was invited to witness these tests, and so far as I know, they never advised us whether they were coming or not coming, and the advice and invitation was sent in time for them to have someone present to witness the tests.

Q Do you know who changed the charts at the well during the period of time that these were run?

A No, I do not.

Q Were they changed by Southern Union personnel?

A Mr. Morris, I haven't the slightest idea, but I would just imagine that eventually Southern Union wound up with possession of the charts, because they were on their meters and the volumes therefrom were used to reimburse Continental for the gas that was sold to Southern Union through them.

Q All right. Let me refer you to your Exhibits 5 and 6 now for a moment.

A We have Exhibit 5 up here. I only have Exhibit 6 on the board.

Q I would like to ask you the questions without actual

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reference to the exhibits.

What wells were used for comparison on your Exhibit No. 5?

A The wells on the north trunk were Caulkins State A295 in 16-26-6; Caulkins Breach C-328 in 13-26-6.

The Caulkins Breach A179 in 19-26-6; the Caulkins Breach B281 in 14-26-7, and the Caulkins Breach A135 in 10-26-6.

On the west trunk the wells were Southern Union Production Company, Navajo 1C and 31-27-8.

The Navajo 4B in 30-27-8; Navajo 2B in 19-27-8.

On the East trunk the wells were Conoco Axi J5 in 7-25-5; the J2 N5 in 25-5

The N48 in 2-25-4. The L5 in 26-25-4.

The L1 in 36-25-4 and Southern Union Production Jicarilla F2 in 33-26-4.

The pressures for these wells were plotted on our Exhibit 6.

Q Now, these wells that you have just referred to, these were the wells used in Exhibit 5 for the purpose of comparison?

A No, these are the wells that are used in Exhibit 6 for the purpose of comparison. Exhibit 6.

Q That is Exhibit 6?

A That is correct.

Q Are any of those wells among the six wells on which you have

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made your study?

A Yes, sir, there are some of the wells that are, yes, there sure are. I noticed L1, S1, and let me get my list of the wells again.

L1 on J2. J? is another one, and so we had those two wells, and I might add that the pressures of this exhibit are instantaneous. They were that pressure which was in evidence on the chart at the minute the guy opened the door and read it. It could have changed.

Q Are just those two wells that you have referred to among the group that were analyzed on Exhibit 6, just J2 and L1?

A The J2 and the L1, yes, sir.

Q Now, on Exhibit 5?

A O.K.

Q Which was my original question.

A Yes.

Q But that is all right.

On Exhibit 5 what wells were used for the purpose of comparison?

A I need to get the exhibit because I have all of the wells whose pressures I observed. We didn't put them all on.

The reason we only reported the pressures for selected wells--if I can have some masking tape, please.

Let me stick this up. Can you see the side over here, Mr. Morris?

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Q That is fine. I don't need to see it. I just need the information.

A We were more interested in the general hydraulic gradients than in the specific pressures on a specific well or on all of the wells all of the time.

Let's see. Let's see. Axi Apache L3 and 7 and 8 and J3.

Q Just those wells?

A Those are the only ones that are shown on our exhibit.

Q All right.

A I took other pressures. I probably took fifty the day I was there, but these are the ones that were put on the exhibit.

Q Are those wells among the wells that you made your comparison on Exhibit 6?

A Yes, one well is.

Q One well?

A Yes.

Q That is the--

A J3 Apache.

Q Pardon me.

A The Continental Axi Apache J3.

Q J3 is on both exhibits?

A Yes.

Q All right. Now, is the J3 among these shown on your

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pressure performance?

A No, sir, it is not.

Q Mr. Mattes, do you know the line pressure on the various trunks of the Southern Union gathering system's present operating pressure?

A I am only aware of those pressures which I reported in Exhibit 6, and in a check-run that we had taken at a date since the 18th of January, that in general verified them.

There were some difference between the individual wells, but the differences were very small.

Q I believe it was your testimony that pressures on the east trunk were running fifty percent higher than the pressures in the north trunk; is that correct, was that your testimony?

A Yes, it was. On my field trip, that is correct.

Q Now, you are talking about the actual operating line pressures there, and I believe that you were using that fifty percent figure to talk then in terms of discriminatory treatment?

A Yes, sir, that is right.

Q My question to you is: Rather than talking about operating pressures, would it not be more meaningful to the Commission to talk in terms of the draw-down; that is, the difference between the reservoir pressure and the operating line pressure in terms of percentage rather than in terms

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of comparing the line pressures themselves? Don't you have to know the reservoir pressures to make a meaningful comparison?

A Don't you have to know the reservoir pressures to make a meaningful comparison on line pressures, is that the question?

Q My question to you is: Shouldn't we be talking about the draw-down, shouldn't we be comparing the difference in draw-down, that is the draw-down between reservoir pressure and line pressure, rather than just talking about differences in line pressure?

A Mr. Morris, I truly think not.

I think the analogy that you have tried to draw is spoken to in the differences, the draw-down differences, if you will, from the deliverability tests.

Q Let me put it another way, Mr. Mattes: Assume with me, and let me ask the question: Do you know what the reservoir pressure is?

A Today?

Q Yes, or at some time in the reasonable, recent past?

A I have a reasonable idea, yes.

Q What is it, approximately?

A Depending on where you go, reasonable average pressure, order of 700 pounds for all of it.

Q It varies from place to place?

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A True, right.
Q Over what kind of a range does it vary?
A Oh, it probably varies a hundred pounds on either side of 700, within reason.
Q You are talking about the reservoir pressure?
A Yes.
Q Don't you have to compare your operating line pressure to find the difference between your operating line pressure and the reservoir pressure, and use that difference on a particular well, and compare that difference to the same information taken from another well that you want to compare it to?
A Our basis of comparison in the South Blanco-Pictured Cliffs Pool is the quality of the wells and the capability of them to produce, as described by the term in the Commission Deliverability Formula, and it was on this basis that we approached the total problem.
Q You stated several times during your direct examination your opinion that discrimination was occurring in this field when you compared one well to another well of reasonable producing character. I believe that was your statement, that is the basis of your comparison?
A No, sir. The basis of the unreasonable discrimination statements that I made related to the gathering facilities that Southern Union provided for gas of like quality,

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quantity, and pressure, and the length of time available.

Q Have you made a study, Mr. Mattes, other than that you have presented to the Commission here today, upon which you base that opinion, or are you basing that opinion on the testimony and the exhibits that you have presented here?

A I am basing the statement of unreasonable discrimination totally on the exhibits and the testimony that I have presented here today.

Q One of your exhibits, Mr. Mattes, was a log, let's see if I can find the exhibit number.

A It is No. 2.

Q No. 2?

A Right.

Q All right. Now, I believe it was your testimony that that was a typical log in the Pictured Cliffs Pool; is that correct?

A It shows the Pictured Cliffs interval.

Q It shows the Pictured Cliffs interval?

A Right.

Q Was it your testimony, or is it your testimony that that is a typical log in this pool?

A I said it is a representative log of the Pictured Cliffs interval. It shows that interval that is called the Pictured Cliffs in the wells on the Continental Axi leases that are shown on Exhibit 1.

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Q Is the interval shown on that log continuous throughout this field?

A I have not made a definitive study that confirms or denies the definitiveness of the zone shown as South Blanco-Pictured Cliffs on the Axi Apache J1 log shown in Exhibit 2 as being continuous throughout the leases shown in Exhibit 1.

The testimony that I have given here relates only to the fact that it is this zone that is called the South Blanco-Pictured Cliffs in J1 and in the same zone in other wells of this area, have also been assigned to South Blanco-Pictured Cliffs Pool.

If I made such a study, all it would have done would have been to verify the ability of the Commission to classify a well and its production horizon in a given pool.

I did not feel it was necessary.

Q I believe you testified previously on cross-examination that you had examined logs of--I forget how many--a dozen or so?

A Eight or ten.

Q Eight or ten?

A Yes.

Q Continental wells?

A Right.

Q You are not able to testify, are you, Mr. Mattes, as to

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whether the sand development as shown by the log on Exhibit 2 is characteristic of a typical well in the pool, or is it typical of the quality of any other well?

A I would answer your question this way, Mr. Morris: No, I am not, but the Commission has provided us a vehicle by which we can in fact measure the capability of wells to produce.

This capability is described in the deliverability formula, and the D that is calculated from this formula, providing the test is properly run, is a fair measure of the capability of all of the wells in the pool, in my opinion, to produce, and if the truth be known, it is my personal opinion that the logs of this area are pretty old, and some of them, especially in this South Blanco-Pictured Cliffs, the only conclusion that you can draw from them about the quality of the sand and its variations from well to well would be limited.

Q Your permeability data is likewise limited; is that correct?

A No, sir, I didn't say that. I didn't say that, but I would reflect as far as permeability that the permeability in general is one measure of capacity.

Another measure of capacity, and the specific measure of capacity that the Commission uses to relate ratability between wells of the South Blanco-Pictured Cliffs Pools, is the deliverability formula that I have submitted in

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evidence here today as Exhibit 4, and this relates ratability, regardless, and includes, as a practical matter, the permeability pressure of relationships for all of the wells.

Q On your Exhibit 22 you made a comparison of theoretical allowable. How did you compute the allowable, the theoretical allowable wells that did not have deliverability tests?

A We just assumed, we used a deliverability test that we had.

Q On your own well?

A No, on everybody's wells.

Q In the pool where you have marginal wells that are exempt from deliverability, what did you use?

A Do we have that piece of paper? We had deliverability tests on all of them.

Q You have deliverability tests on all wells, whether they are marginal or not?

A Yes, there are deliverability tests on all of the wells that are available, yes, sir.

Q Some of them are pretty old?

A Yes, sir, they are.

Q Is that what you used?

A Yes, sir.

Q Let me refer you to your Exhibit 20.

A O.K. That is the one right there, yes.

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Q Now, that is a plot of your monthly production against time. I think the last data that you have shown on that exhibit is production for the month of November?

A That is true.

Q Do you have reported to you the production figures for the month of December?

A We did on the Continental wells. We did not get the time to include it on this exhibit. We do not have the Southern Union total system. We got those numbers from Commission published reports.

Q All right. Do you have the total for the month of December on the Continental wells?

A Yes, I have got it somewhere.

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Q Would it be about 55.6 million?

A I do not know that to be a fact. Yes, I will verify that for you, be produced to.

Mr. Morris, I was in error. We do not have the total production for December for all of the wells on the Continental.

Q Mr. Mattes, let me just ask you, do you know from that that the production for the month of December was substantially less than the figures you have shown on your exhibit for the month of November?

A I do not know that to be a fact. I do know for the six wells the information which we ran on the special deliverability test, I have the data right here.

Q I am more interested, Mr. Mattes, in your total production, but I will take whatever you have.

A I have the December production for the six wells of Exhibits 14 through 19.

Q Excuse me. I didn't get the answer.

A I have the production data for the period we have described for the wells in Exhibits 14 through 19.

Q Well, that is fine, however, can you testify that that is typical of the production for all of your wells?

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A I couldn't do that, Mr. Morris, no, sir.
Q Let me ask you this, does it show a significant decline during the month of December from the month of November?
A Does it show a significant decline?
Q What decline does it show?
A O.K. Can I read you the numbers for November and December?
Q Would you give it to me for October, November, and December, if you have those three there?
A Sure.
Q O.K.
A I will recite these by well for the months of October, November, December.

You are just interested in the production rates only; is that right, for these months for these six wells?

Q I was asking you for actual production.
A Yes, the actual production for these six wells, that is the only number you want; is that true?
Q Yes, in answer to this question.
A O.K. J-1 98, 8835536, 5995

J-2, 2986, 2893, 3098

L-1, 1367, 1754

L-3, 226, 2790, 1447;

M-1, 350--no, that is the wrong number, 85485678;

O-1, 3311, 2263, 1468

Q All right, sir. Now, were these wells on the line

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continuously during this three month period?

A Well, the record I have shows the number of days produced.

Q Does it show they have produced every day?

A No, it doesn't.

Q All right. Looking at any paragraph showing monthly production versus time you have to know how many days out of that month that well or that group of wells were on the line, don't you?

A I had answered your question. Was this about something else? Would you repeat it for me, please, sir?

Q I am asking, in trying to make sense out of an exhibit that shows monthly production against time, you either have to know that the wells were on all of the time or else you have to know how many days, how many production days you are talking about?

A Yes, that is right, to apply some significance to the number I have recited that would relate the well capability to production you would have to know how many days they were on the line.

Q Do we have that information? Have you presented that information with respect to your Exhibit No. 20?

A Have I presented the number of days the wells were on the line with Exhibit No. 20?

Q Yes.

A No, sir. Exhibit 20 only reflects total volume from the

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Commission records they report, in a statistics report.

Q If in a given month a well or group of wells was not producing, your production for that month would show less than it would if the well had been producing for the entire month?

A I agree, when we look at this Exhibit No. 20 without knowing the producing days, we don't know what the fluctuation was.

Q What the fluctuation was?

A In the number of days each of the individual wells produced, that is right.

Q Let me ask you this: You may have already said that you didn't know the answer to this, Mr. Mattes, but on your Exhibit 20, could you agree with me that production for the month of December would be substantially less than the production shown for the month of November?

A No, sir, I do not--

Q For Continental?

A I do not have that data. I only have data for the six wells that we have, in answer to your question.

Q In other words, you are saying that you don't know that Continental wells have declined in production since their peak there in November; is that what you are testifying to?

A I do not know what the December production is, that is right, except as related to these six wells.

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Q May I have just a moment? We are almost through.

MR. MORRIS: That is all we have on cross-examination.

MR. PORTER: Does anyone else have a question of the witness?

CROSS-EXAMINATION

BY MR. UTZ

Q Mr. Mattes, Mr. Nutter gave away our Exhibits 5 and 6, so I will try to ask these questions from memory.

A You may have the exhibits if you wish. I have them memorized.

Q Let me try it first without the exhibit.

I believe on Exhibit 5 and Exhibit 6 you had a compressor station marked Jicarilla compressor?

A No, Dogie Canyon. It is Dogie Canyon compressor.

Q Well, didn't you have another one marked Jicarilla compressor that serves the east system as you mark them, east, north, and west?

A No, all I have is the Dogig compressor. You may be referring to the Ingersol Rand SDGA. Is that the one you are talking about?

Q I don't know. It is over on Section 7 on the east system, Section 7 on the east system.

A I only testified about the Dogie compressor.

Q Well, then tell me what compressor serves the east system that you have described?

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A In Southern Union?

Q In the Dogie Station.

A Elvis, I do not know the answer to that one, what specific compressor, I do not.

Q It is a compressor there at the Dogie Station?

A Yes.

Q And another compressor in the Dogie Station serves the north system?

A Elvis, in my testimony I have concluded this, just based on the compressors that I observed, and the map as provided by Southern Union.

These inferences are based on the circumstance that these two, to me independent pieces of data, got reasonably married together; as far as the actuality of which specific compressor is hooked up to which specific trunk, I cannot state positively.

Q Well, let me ask you this then: Is it my understanding that you are asking the Commission to stabilize or equalize these line pressures between your eastern system and your northern system and the western system to provide substantially--

A At what point?

Q At what point?

A At what point?

Q Would it be in the vicinity of the Dogie Station?

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A Yes, in the vicinity of the Dogie Station would be just fine.

Q Well, then the Dogie Station does serve all three of these?

A All three of the trunks that are shown on my Exhibit 5, that is right.

Q Now, what else are you asking the Commission to do?

A Well, we have asked that all our wells are assigned non-marginal allowable and that the under production of them not be subject to cancellation.

Q For what period of time?

A Until they become truly marginal wells in our opinion.

Q If they are non-marginal wells, they will accrue under production providing they don't take the entire allowable?

A That is correct.

Q Are you asking this underage not be cancelled at the end of the balancing period, carried on maybe two, three, four, five balancing periods?

A Yes, that is right.

MR. UTZ: That is all I have.

MR. PORTER: Mr. Kendrick.

CROSS-EXAMINATION

BY MR. KENDRICK

Q You have six exhibits on the board there with well tests of production rates and pressures.

You testified that the high production rates on the

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four on the top row were taken from the deliverability test taken with a compressor in service?

A Right.

Q Were the other volumes and pressures taken from similar conditions of flow, third week charts average pressures for those same flow charts?

A No, sir. The other two points were average flow rates for the month divided by the number of differences that that well produced during the month and the pressures, the average pressure at the well from the meter charts as provided to Continental Oil Company by the purchaser, Southern Union off of the meter charts from which the gas is sold.

Q Then, on the four charts exhibited on the board there?

A O.K.

Q The two points, the central point and the lower point, the flow rates, their average in such time as the well had been shut in for a period of time during the month and the high rate of production after turning those wells back on is included in the average daily rate?

Let me re-word the question.

A O.K. I am trying to follow you.

Q I understood your answer to my previous question was that was an average daily rate for a month in each casing?

A Yes, sir, that is right.

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Q Which includes high rates of production or higher rates of producing after the well had been possibly shut in sometime during those months, which your records do not reflect on the graphs?

A Yes, sir, I said, that is a fair statement, but I also did not include as average thirty days production on this chart those months in which the wells produced substantially more gas when the compressor was operative and we were running the deliverability tests, which gas used the high rate ?

Q You high rate volumes you testified as being the average daily rate during this week?

A That is right.

Q Of deliverability type tests where there was uninterrupted flow?

A That is true.

Q Thank you.

MR. PORTER: Anyone else have a question of the witness?

MR. KELLAHIN: May I have a couple?

MR. PORTER: You can. Are you going to cross-examine him?

MR. KELLAHIN: Yes.

RE-DIRECT EXAMINATION

BY MR. KELLAHIN

Q Mr. Mattes, you just testified that during those

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deliverability tests there was uninterrupted flow. Had you had a water problem, those would not have been uninterrupted, would they?

A Well, that is true.

Q So that would be evident that you had no water problem?

A Yes, I would say that is right.

Q Now, the wells you have chosen to test, the six wells, did you have cores on those wells?

A Cores on those wells?

Q On the six wells you tested?

A Not on all of them.

Q Not on all of them. You did on part of them?

A On part of them, yes, sir.

Q If a well is producing against higher pressure rates, assume for a moment that there is a water problem in the South Blanco-Pictured Cliffs Pool. If the well is producing against higher pressures, is it more likely to have problems with water than one producing against lower pressures?

A A well that is producing against the higher gathering system pressure is more likely to have a water problem than a well producing against a lower system back pressure.

That is why we have the pits by the wells, because of the back pressure at which we produce them when we unload the water is at atmospheric.

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MR. KELLAHIN: That is all of the questions I have, Mr. Porter.

MR. PORTER: Any further questions of the witness? The witness may be excused.

MR. KELLAHIN: That, Mr. Porter, completes our direct testimony on this case.

MR. PORTER: Mr. Morris, would you like to call your first witness?

MR. MORRIS: Can we have a recess?

MR. PORTER: We will have a short recess to give the attorney time to mark his exhibits and post them.

(After recess.)

MR. PORTER: The hearing will come to order, please.

MR. JAMESON: We would like to call as the first witness, please, Mr. Oren Haseltine.

OREN HASELTINE

a witness, having been first duly sworn according to law, upon his oath, testified as follows:

DIRECT EXAMINATION

BY MR. JAMESON

Q Please state your name.

A Oren Haseltine.

Q By whom are you employed?

A Southern Union Gas Company.

Q In what capacity?

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A As manager of Gas Supply.

Q Mr. Haseltin, would you give us a brief resumé of your educational experience in the oil and gas industry?

A I have a degree in mechanical engineering from the University of California.

I worked for eight years for Signal Oil and Gas Company on the West Coast, and in the Mid-Continent area as an engineer.

My last position there was as a senior production engineer.

Since that, I have worked for Southern Union Gas Production Company.

Again in 1958 as a drilling superintendent, and since that time as the production superintendent, and at a later time since about 1962 or thereabouts as manager of gas supply for Southern Union Gas Company.

Q Would you briefly describe your duties as manager of Gas Supply for Southern Union?

A My duties are the procurement of gas for our system on long-term contracts or through exchange agreements, or on short-term contracts.

My duties also relate to the servicing of those contracts as they age and as conditions change, and to make sure that Southern Union performs in accordance with the contracts, renders payments in accordance with the terms,

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and properly keeps the books and records on these matters.

Also I have a duty regarding records of reserves for Southern Union Gas Company, since gas is its stock in trade.

Q Mr. Haseltine, during the course of your employment with Southern Union have you had occasion to become familiar with the San Juan basin production area and specifically the South Blanco-Pictured Cliffs Pool?

A Yes.

Q Have you become familiar with the facilities operated by Southern Union in those areas?

A Yes, sir.

Q Directing your attention to a map identified as Southern Union's Exhibit No. 1, I will ask you to give us an explanation on that map.

A This is a map of Southern Union Gas Company flow pressure system serving the South Blanco-Pictured Cliffs Pool and some other areas adjacent to that pool.

You will have noticed the similarity between this map and some of the preceding exhibits, so I will point some of the things out that have not been explained, and then some of the differences.

First of all, we have, of course, on this map the wells located and identified by operator name, well name and number.

We have the limits of the South Blanco-Pictured Cliffs

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Pool shown on the map, insofar as this map covers that pool.

You will see generally trending northwest southeast two roughly parallel lines that are shaded on the map, and these are the limits of the South Blanco-Pictured Cliffs Pool, the pool extends off the map in both directions.

Now, also on this map, if you look at the bottom of Township 26 and the top of Township 25-6 you will see three check meters identified there, check meter number 9631, check meter 9630, check meter 9639.

I will be talking about those check meters further a little later.

Generally, you will notice, of course, as has been pointed out on previous exhibits, that the Continental wells are located in Townships 25-4, 25-5 and up at the top of 26-5.

Some of the wells in that South Blanco-Pictured Cliffs Pool connected to Southern Union that are not Continental's are located in 26-6 General Lowerie system serving the Caulkins wells, and then we have a connection to some other Southern Union Production Company wells in this pool at the extreme corner of Township 27-8.

You probably have inferred already from past testimony, but just to make sure, let me describe the flow of gas, the flow of gas is inward from all the outlying areas to the Dogie Canyon Compressor Station and then south from that

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point through that pipeline system that runs to our Lybrook gasline plant and then on to the market.

This map also shows the twelve-inch loop line which was not on the previous exhibit.

This twelve-inch loop line extends from roughly the common boundaries of 25-5 and 25-6 westward to the Dogie Canyon Compressor Station.

There are now two parallel twelve-inch lines in that same pipe right-of-way.

Also there where we have designated the Dogie Canyon Compressor Station at the north end of 25-6 we have there now in operation a 3,000 hp that was not in operation prior to September, October of 1971.

Q Mr. Haseltin, you mentioned a ten-inch loop line and a 3,300 hp compressor unit installed in 1971. The suggestion has been previously made in the testimony that Southern Union installed those facilities only pursuant to a Continental complaint; is that correct?

A No. As a matter of fact, those additional facilities were approved in the budget meetings held in the fall of 1970.

All of the planning and the necessity for that work had to be made and proven for budget committee work prior to the end of calendar '70 to get it into operation in '71.

I believe our first conference with Continental regarding this problem occurred in the spring of '71, probably

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around May, which was several months subsequent to the time this additional loop line, this additional hp installation had been approved, and of course, these things were pointed out as plans that were then under way and concretely to be achieved during that summer construction period, in our conferences with Continental.

Q When were these new facilities--by that I mean the loop line and additional compressor unit--installed, and when did they go in service?

A The construction work went through the middle and late summer of '71, probably beginning in July, and then most of it was finished up around the end of September, you know, there was some up and down time at the end of September and the early part of October when those facilities were being tested and put on the line, the bugs chased out of the compressor, this sort of thing. Basically they went into service mid-October.

Q Does this map show all the Pictured Cliffs wells in the South Blanco-Cliffs Pool that are connected to Southern Union's facilities?

A It shows all of them connected to the facility on this map.

Q Right.

A There is one stray that is not on this map.

Q All right. You mentioned three check meters. What are those check meters capable of measuring?

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A They measure and record contractually the pressure and flow rate from the three trunk systems shown on this map into the Dogie Canyon Compressor Station.

One thing I should have pointed out a minute ago, and I failed to, there is a substantial difference in our Exhibit here as related to the system into the Caulkins area and the exhibit you have already seen.

We have in that Caulkins area two systems, a high pressure and low pressure system.

We deleted the high pressure system from this map and the high pressure trunk line that comes into the Dogie location, and we deleted all of these wells that were tied to that high pressure system for the purpose of clarity, because when you have two gathering systems that actually overly each other geographically, to depict those two on the maps leads to a good deal of confusion as to which is which.

Q Was your reason for omitting the gathering system the fact that the wells connected to that system are producing from the Dakota Formation?

A That is basically a Mesa Verde-Dakota system, that is correct.

Q Mr. Haselting, I direct your attention to a schematic drawing identified for the record as Southern Union's Exhibit No. 2 and ask you to explain what is shown by that exhibit?

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A Exhibit No. 2 is a schematic of the Dogie Canyon Compressor Station, and it shows the normal flow pattern typical pressures and volumes as that station operates.

Now, each compressor unit there is designated as a square. Each one of them are identified by number, as we identify them on our records, and they are identified by either nameplate capacity or D-rated nameplate capacity.

You will see we have there the 550 hp Ingersol Rand reciprocating unit.

Then next to the No. 2 and No. 3 are 1,100 hp Solar Centrifugals, the final compression there is 3,300 nameplate or the 3,000 D-rated capacity Solar Centrifugal. The Ballard system, that system extends westward from the station and the Lowerie system that is a low pressure system going to the north, both feed into the Ingersol Rand recip.

The Jicarilla system, which is the system extending westward through the Continental area, then on up into another productive area, the Jicarilla system feeds the No. 2 and No. 3 1,100 hp Solars, which operate in parallel, all three of those compressors take first stage compression on the three low pressure systems in the area.

Now, the Largo system, that is the one that we deleted from the map which overlies low pressure, the Lowerie, the Largo system, bypasses that first stage of compression and

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feeds into the suction of the 3,000 hp Solar, so that we have two stages of compression on all of the low pressure systems and one stage on the high pressure.

You will notice there that the typical volumes as measured through the check meters we described a minute ago are three million from the Ballard; six million a day from the Lowerie, for a total of nine million going through that small Ingersol Rand recip.

We have on a typical day about forty-eight million a day coming out from the Jicarilla system going into the two parallel Solars.

The suction pressure there for the Ballard and the Lowerie typically is 165 psig, and for the Jicarilla system is 215 psig.

The discharge, of course, is common manifolding together for all three of those low-stage compressor units, and that first stage discharge pressure is 320, and then the high pressure machine boosts it on up to 520, to get it on the mark.

Q Now, Mr. Haseltine, the witness for Continental has testified that in this proceeding Continental is seeking one of two things as related to this exhibit.

One, an increase in the inlet pressure to a 550 hp compressor unit to equal 215 inlet pressure on or about two Solar units or a reduction on the 215 pound pressure at the

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inlet to the two Solar units to 265 inlet pressure on the Ballard-Lowerie.

Could you outline for us the difficulties that would be encountered and what would be required to accommodate either or both of those, one or the other of those alternatives?

A Well, the superficial view of this thing would be to simply manifold those three low pressure systems together and the three compressors together on the suction side, but that is physically not possible with the machines that are there.

First of all, the Solar's centrifugal design limits the ratio of limit from suction to discharge on these Solar machines to one point seven five .

A recip is designed and used for a higher ratio of lift than this.

By "ratio of lift" I am talking about an absolute pressure out divided by the absolute pressure in, so you can't stretch the ratio on the Solars. They simply won't operate that way.

On the other hand, you can stretch the ratio on the recip. Another of the reasons, of course, is that the recip is working at a fairly close ratio, the reciprocating machines have such flexibility in the cylinder size--to adjust a given machine for different conditions, but there is a limit to that flexibility.

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The third thing is that these centrifugal compressors have certain operating conditions that lead to instability, that we refer to as surge in the machines, and when they begin to surge a high speed centrifugal compressor can destroy itself, so it is physically not possible to manifold these three together, on the suction and on the discharge side.

Q In your opinion, would it require a substantial expense on the part of Southern Union for either new machines or a modification of the existing machines to manifold all three units together on the suction side?

A I really doubt that the Ingersol could be modified to serve that way. It would probably have to be changed out and either one would represent a very substantial expense.

Q Then, in your opinion, thisis the method that they are operating at at the present time with regard to the suction patterns the only practical, feasible way for Southern Union to continue to operate those machines?

A Yes, that is my opinion.

Q I direct your attention to a table entitled "1971 Average Production Pressure" that has been identified for the record as Southern Union Gas Company Exhibit No. 3, it is a tabulation of every South Blanco-P.C. well that we have been talking about connected to Southern Union Gas Company.

The wells are listed by operator, number, well name

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and well number. The location is shown.

And then for each separate month of 1971, the average production pressure is listed there.

Now, at this point I might mention that we have got several of these tabular exhibits.

They look like a tremendous amount of data that is hard to assimilate.

We will talk about specific wells that will represent what is on the total exhibit, but the reason we put all of this data down is because we don't think that the Commission can fairly be expected to understand the total matter by a spotty presentation of just a well here and a well there, so we have gone full bore and put the whole picture down so that you can see everything that is involved on this.

Now, let me point out, first of all, going down the list there, the first two Caulkins wells, the Breach 221 and the Breach 224.

If you look at the January pressures for 1971, you see 208 and 214 respectively.

Now then looking at August pressures you see 289 and 282 for those two Breach wells.

This ties back to what I was saying earlier about the construction period during the summer and early fall of 1971.

We had to have the Dogie Canyon Station off the line either partially or at times in total during the summer.

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All of these weeks during which construction was going on this was necessary because of necessary revamping and moving machines in and out, manifolding in, piping, cutting in, etc., plus the tie-in of the major loop line that was going into service at the same time, so during that August-September period there are some high pressures that you will notice there on this exhibit.

Then, still referring to those first two Caulkins Breach wells, look over at December and you will see those average pressures there are about the same or maybe down a little bit, probably if you took the average of all of the Caulkins wells, January, '71 and compared them with the average pressure on all of the same wells in December, '71, there is some reduction in pressure.

Of course, this came about through use of this new 3,000 hp station, a second stage machine for all of the Dogie Canyon through-put.

Let's take a look now at a couple of Continental wells. The Axi Apache J1, which in January of '71 was operating at 344 pounds.

During the period of down time or when they, the compressor station was partially out of service, those pressures got up to 421.

Now, then that station or that system received the benefit of the new facility beginning in October, and you

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will see the pressures starting to go down and very substantially further down in November, and still further down in December.

Let's read those numbers, because they are important.

You have got 273 pounds showing on Apache J1 in November and 254 pounds on the same well in December.

Now, skip down to J7 as another example here.

If it was operating at 337 a year ago in the winter time

Typically in August and September it went over 400 during that construction period that the well then operated in November 257 pounds, and fell off to 244 pounds in December.

So pressures were still coming down for several weeks after that station was in operation.

The station and the facilities were in full operation by mid-October, but, see that through the last half of October through all of November and all of December pressures were still declining.

Now, as a matter of fact the average Continental pressure--it is not on this exhibit--but the averages of the Continental pressure for November comes out to be 282 pounds, the average Continental pressure in December comes out to be 273 pounds, still a nine pound decline during the thirty months after those compressors and new facilities

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were in operation.

Q Mr. Haseltine, I call your attention to the exhibit tabulation entitled "1972 Average Producing Pressures," identified for the record as Southern Union Exhibit No. 4, and ask that you explain that exhibit.

A Exhibit No. 4 is an extension of the preceding exhibit right up through to the very latest information that as a practical matter we could count on getting in the record here.

This takes us through the first two chart periods of 1972.

The dates of the two right hand columns, January 1 and January 9, refer to the chart of dates.

I might mention here, because again this question will come up later if we don't cover it now, the Commission some years ago allowed gas purchasers to operate on a fiscal month in order to meet certain problems in getting data into the Commission and to the production or time, so we as any other gas buyer in the area, circle charts of on days other than the 30th or 31st, and so this first chart here, which is what is a full seven day chart, came from January 1, which reflects a December chart period, the full December month ended some time like around the 24th of December, some date like that, so January 1 chart of data is the full seven day chart, and January 9 is a full eight day chart.

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This cycle on and off of eight day charts also will lead to some months actually consisting of 23 days to 32 days.

I think 23 is probably, we have some as low as that, but again, this is a Commission-approved procedure, and it is a procedure that all gas companies use.

It is simply a means that once or twice a year a particular month is going to have three chart periods, whereas as a general rule the month will have four chart periods.

Q Does this Exhibit 4 and the data shown on it reflect a continuation of the lowered pressures that were shown in the preceding Exhibit 3?

A Yes, it is not as striking because we are talking about shorter intervals here, and of course, there is some leveling out as the system goes off the rate of decline of production.

Now, again let's talk about the same well we talked about before, the first two Caulkins-Breach wells, and in the January 1 chart, or the average chart period, it showed a 210 pound pressure, which was the same as for the full month of December.

As a matter of fact, the next chart period for that same well shows a nine pound increase, but you look down at the next well down and there was a real high pressure

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recorded on that chart, the first chart period of January.

We are talking about the Breach 2-24 well. It shows 280 pounds of, which fell to 200 on the second chart period.

Now, from one chart period to the next there will be some bobbling around and fluctuation of these pressures. It depends on a lot of things, upon who is buying drilling gas in the field, depends on who is using gas in the field to blow wells down and rework wells with gas as drilling fluid.

It depends on line freeze or dehydrater problems.

It depends on whether a producer at that time is keeping his well clean or not.

It depends on a lot of things when you are looking at one small chart period to the next, but even dealing with chart periods, the short interval of the chart period on an average you will find that the decline in pressure continues, and if we take the average of the Continental wells, the pressure recorded on the January 1 charts, they show a 272 pound pressure, and the average for the January 9 charts shows a 261 pound pressure.

Now, that is a nine pound drop in seven or eight days.

It is still a substantial drop in pressure.

It doesn't necessarily mean that they will drop nine pounds every chart period, but it does continue the trend of declined pressures that began in mid-October, which now

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has been some three months prior to the time we are looking at right here on Exhibit 4.

Q Do you have any reason to believe that trend will or will not continue?

A It will continue. We haven't seen it bottom out, as a practical matter, yet.

We are not surprised.

We expected these things to continue to pull down for some months.

It is indicative and typical of the San Juan Basin rock and reservoirs that a substantial change of whatever kind in the operating condition at a well don't fully reflect themselves for several weeks. They simply respond slowly, and we will see these pressures continue to decline.

Now, we want to talk in a minute about volumes, but I want to tie the two things together while I am talking about pressures.

The reason the pressures are coming down in this system is because the volumes are coming down. The coupling operation is simply the pipe in the ground, we stuck the coupling in the pipe in the ground in mid-1971, put them in operation full time in mid-October and they have been operating since then at relatively one set of conditions, but the gas output of this system is continuing to fall. Therefore the pressures are continuing to fall.

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Normally you would expect wells to produce more gas as pressure falls, but the opposite is appearing here. The declining volumes is allowing the pressures in the gathering system to fall.

Q I direct your attention to the tabular exhibit entitled "Production 1971", identified for the record as Southern Union Gas Company Exhibit No. 5, and ask that you explain that exhibit.

A This is a comparable exhibit to the last two we have been looking at, the two previous exhibits dealt with pressures over a period of time for every well we are discussing here today.

The exhibit that we are looking at now is Exhibit No. 5, and deals with production from those wells.

The order of tabulation is still the same. It has the individual well volumes for every month, and we need to look at some specific operator wells here in order to keep this thing in context with the problem we are dealing with.

Let's turn to the second page there and look at the operator total for Continental Oil.

January of '71 all of the Continental wells produced 44.5 million for that month, and as nearly as I can tell, this is the same number that went into one of the previous exhibits where this data was plotted on a graph.

August and September we are talking about the time the

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facilities were down for construction production was off.

July was approximately 22 million feet from Continental.

August was 34 million, or as it is listed here, 34,000 Mcf, and then in October the last half of October the compressor and all of the facilities went into full time operation.

Continental's volume climbed to 58,546 Mcf.

It continued up in November with a full month of operation being reflected at 71,963 Mcf.

Then this thing that we are talking about of a decline in gas availability, even with the compressors sucking as hard as they can suck on that system, the old wells are getting tired and the volume is off very substantially from 71,968 Mcf to 55,644 Mcf.

Again, this is no surprise, and this kind of decline is not necessarily limited to the Continental wells.

It is reflected anywhere you have thin type sand for reservoir rock, and you pull on them hard you get a little bit of flush production that comes out to you for a few weeks, but eventually you get back on down to where you were to start with.

Q Directing your attention to the tabulation entitled "Production, 1972," entitled for the record as Southern Union Gas Company Exhibit No. 6, I will ask you to explain that exhibit.

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A This , again, is an extension into the first two chart periods of 1972 of the data we were just looking at on Exhibit No. 5.

In order to meaningfully relate chart period volumes to monthly volumes that we were just looking at, we need to translate it to Mcf's per day.

The Continental wells in total for the first chart period, seven day chart period, produced 1,957 Mcf per day.

The second chart period, they produced 1,954 Mcf per day.

Now, 3 Mcf out of 2,000 is not much of a decline, but it was a 9 pound drop in pressure during that time.

The pressure drops immediately reflected in increased production should have caused the January 9th production data to be higher, but it simply was not the case. It is still continuing to fall downward.

Q What, in your opinion, will be the trend beyond the period shown by Exhibit 5 and Exhibit 6 with reference to Continental production up against the pressures that have been lowered in their portion of the gathering system?

A There is no doubt in my mind but that they will continue to decline.

Now, how fast, I don't know.

Certainly they are not declining as far now as they were say in the month of December when they fell off to--

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very,very greatly from the month of November, but they will continue to decline and the pressures and volumes alike will come down. I don't know where it will bottom out.

Q In youropinion is it a probability that they will bottom out at say in January of 1971 when they were producing against 100 pound's higher line pressure--

A They are going to approach that. They will be close to it when they get fully pulled down.

Q What is the reason for the longer period that it takes for wells to level out in the production rate?

A This is a function if extremely low permeability reservoir rock that exists not only in the South Blanco-Pictured Cliffs Pool but particularly in the San Juan Basin reservoirs.

It is not only reflected in production operations as such but the Commission has recognized this. In fact, they have assigned a seven day build-up to the San Juan Basin and no other area of the state.

Also, the Commission requires for deliverability testing a longer preconditioning and flow period than for other areas. This is simply a reflection of the fact. It has been recognized for years, and everyone knows this, and it is continuing to be recognized and dealt with, and that is that the San Juan reservoirs are tight, typically low permeability. They require a lot of treatment in order to make them commercially productive and they simply do not

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respond as quickly as a lot of other reservoirs in New Mexico do.

Q Mr. Haseltin, I direct your attention to an exhibit tabulation entitled "Production Days, 1971." Southern Union Gas Company Exhibit No. 7. Would you please explain that exhibit?

A Again, this is the same list of wells we have been working with. It shows the production days for every month during 1971, days on against, as for instance, for February shows 31 days on for many wells, and although there aren't 31 days in February, but there were 31 days in the chart month, and those wells have, show they were on production 31 days in February, meaning that they were on line full time.

Now, we log these days on in this way, that if we have our valve open and the well is exposed to the line, that is a well-on day.

Now, if that well is logged off and doesn't produce, it is still a well-on day. It is what is called on to produce. It may not have made anything, but that is a day on.

Now, then if we shut the valve for test purposes for pipeline repair or whatever, that is a day off.

If you look down there at the bottom of the page, the Continental wells, and just glance through there, you will see almost totally that those wells were on just almost 100

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percent of the time. The wells have to go off the line occasionally. We have to close the valve. Now and then we might have a dehydrater to change out or the line to repair or the operator may want to do his state-required testing, but whatever reason, but when wells show 350 plus days per year total as days on, that means they have been off the line all there is. That is all there is for them.

Q Does this chart reflect that no discrimination has been practiced against Continental in favor of anybody else, as far as the production days made available to Continental wells?

A Yes, it does.

Q Mr. Haseltin, referring you to the exhibit entitled "1972 Producing Days," identified for the record as Southern Union Gas Company No. 8, I will ask that you explain that exhibit, Exhibit 8.

A Exhibit 8 is our continuation into the first two chart period of 1972 of Exhibit 7, listing the production days for every well for those first two chart periods.

Again, let's glance at the bottom of the page 1 and you will see that all of the Continental wells during that time on page 1 were open to the line the full period of time.

On page 2 you will see that they were on almost all of the time.

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Now, notice the Apache L4.

It was off the full chart period for the chart that came off January 9. That well was shut-in for a test. Notice that the Apache N6 was only on the line four days for the first chart period there.

That was to accommodate rework and pressure buildup work by the operator.

Q Now, relating Exhibit 8 and 9 to Exhibit 6 and 7, can the decline in production rate from Continental's wells during that--that occurred in December and in January be explained by any denial of access to the gathering facilities?

A You mentioned the wrong numbers.

Q Seven and eight relate that to five and six?

A All right. No, seven and eight simply support the fact that these wells were on the line, we will just say all of the time, and the pressure and volumes have continued to decline.

Q Those declines then can't be explained on the basis of Continental wells, for part of the Continental wells were shut-in during the period of the decline.

A No.

Q Your attention was directed to an exhibit entitled "Day's Average Pressure and Production," identified for the record as Southern Union Gas Company Exhibit 9.

Please explain that exhibit.

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A Exhibit 9 is a lease summary of the performance of the Continental wells that we have talked about in the preceding six exhibits.

Now, Exhibit 9 is confined to the last four months of 1971, and the first two chart periods of 1972.

Now, the thing that we really need to be looking at here is the Mcf per well day column.

The one of significance is the Mcf per well day.

I think everyone has got in mind the pressure performance and the timing of the compressor installation, and so on, so notice the, for instance, J-lease there. 1971, September, that lease averaged against the existing pressures then, which were at a maximum due to construction, 43 Mcf's per well day.

It hit a peak in October during which the compressors were only in operation about half of the month, but it pulled the head off of those wells in October in half a month and peaked out with an 83 M per day average.

Now, November with 30 days of operation, those wells could not even sustain what they had accomplished in 15 days of low pressure operation and 15 days of high pressure operation due to the declining head as it comes off the well, so they were down to 82 M's per day.

Now, you glance on across there through the remaining periods, you see that that J lease fairly well sustained

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that rate, although it is coming down some, it hasn't dropped extremely from its high of 83 M's per day.

We are showing 70 minimum as the last measured rate on that J lease, but now you look at the K lease. That is the next one.

During the period of high pressure operation in September that thing made 33 M's per day per well.

Look at the last number over here. It is down to 35. There is a 2 Mcf per day difference, and we have got a 150 pound difference in the line pressure.

The L lease was going 44 M's against the high September pressure.

It will do 46.

The M lease did 39, and it will do now 43.

The N lease, this one, has shown some resistance. It may be able to sustain it. It was 57 during the period of high pressure operation.

It peaked out in November at 113 Mcf per day.

It has since fallen with lower line pressure to 94 Mcf per day. It is not falling as rapidly as the three leases immediately preceding. Look at the 0 lease. It looks as if we did the wrong thing in reducing pressure on that one.

It went from 89 M's to 49 M's per well day.

First of all, in total, these leases are not sustaining any kind of a marked improvement, even though pressure

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has been substantially reduced, and the second thing, and this bears out what we are talking about, the quality of the reservoir rock, these wells are poor by any standards. They wouldn't make 50 M's per day generally as an average per well, and so we are talking about wells that a prudent operator would not hope to achieve with any well to drill to 3,000, 4,000 foot depth.

Q Mr. Haseltine, in your opinion would you conclude that the substantial reduction in line pressure in the gathering line connected to Continental wells hasn't substantially helped their production rate and wouldn't substantially help their future production rates?

A That is exactly my conclusion.

Q Mr. Haseltin, I direct your attention to a graph identified for the record as Southern Union Company Exhibit 10, entitled "Wells of Production Rate Line Pressures versus Time." Would you please explain that paragraph?

A This paragraph is a plot of daily information taken from the check meters that serve the Jicarilla gathering system.

Now, you will recall on Exhibit 1 we pointed to three check meter locations where those gathering systems and pipelines gather together there at the Dogie Canyon Compressor Station.

The check meters were located there at the compressor station.

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This is one of those check meters. It reports the volume-throughput on a daily basis, and the pounds of pressure existing at that check meter.

There is some other information, and that is the well-- this is information that we receive daily from the field which shows the number of wells of the line feeding a particular system.

Now, let's take a look at that top curve, that is a plot of wells off it.

You notice in January and February very few wells are off.

This is because we are serving a high demand heating load at that time.

Then again in April and on through the summer you will see a period every month there where there is a large number of wells off.

This correlates with the testing schedule for Commission purposes.

The wells that are there off are being shut-in for their eight-day buildup test.

Prior to that time they had been on flow for their preconditioning and flow test.

Now then you look on over in August and September, the charts become a little erratic there for wells off.

This was during that construction period.

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Then beginning in November the number of wells off has been dropped down again to a low level.

There are two or three periods there in December and January when the wells off ran from 10 back up to about 20 for a few days.

This was a changing out of some equipment, some wells actually in the system, this Jicarilla system were over produced and shut back for over production, a few things like that.

Now, the next line down is the volume through put, plotted on each day, and what we want to look at here is the volume through say as a January-February average, and I would say just draw a line there at about 44 million per day as probably an average number through January and February.

Now then, since the installation and operation of the new facility, you look over in December and January and you see a volume through put there that is around 48 million per day, so we have picked up about 4 million per day from that area by the installation facilities.

Now, the third line, look at your pressures again, as recorded, January and February, probably an average would be 280,293 hundred, something like that. Those pressures now over in December are running about 220. They have dropped off a little bit in January.

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They bobble back up right there at the very last of the data, we have got it plotted. It looks as if the trend is still slowly downward, certainly not coming down as far as it did in October and November, but I believe there is a trend continuing downward even on the pressure there at exhibited.

Q Does this plot reflect totals for all wells connected to the east leg of the gathering system that is shown on Exhibit 1 as the Jicarilla line?

A Yes, that check meter serves all gas coming into the Dogie Canyon Station from the Jicarilla line.

Q It is not necessarily related only to Continental wells?

A No, it is the total gathering operation in that area.

Q But Continental wells would certainly affect the totals?

A Yes.

Q Mr. Haseltine, I direct your attention to the graph identified for the record as Southern Union Gas Company Exhibit No. 11, and ask you to explain that graph.

A Exhibit No. 11 is the same information for the Lowerie check meter that we had exhibited on Exhibit No. 11 for the Jicarilla check meter, the Lowerie meter is located at the Dogie Canyon Compressor Station and measures the flow from that system that runs northward out of the Dogie Canyon to the Caulkins producing area.

I think that system on the map is on Exhibit 1.

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It extends up through Township 26-6 and gathers gas in that township and some adjoining townships that is called the Lowerie system and performance of that system in total, as reflected by the Lowerie check meter in this Exhibit No. 11.

Without going into all of the explanation, you will notice again the wells plotted on the first curve, the million feet per day through put.

Notice January and February showing about 6 million per day as a good sustained rate.

That volume available to us out of that system has dropped off, it looks now as if five and a half is probably about as good as we could average out of that area.

The pressure as recorded at the Lowerie check meter January and February was running about 175, maybe 180 on an average, and is now down to about 160, something like that for an average pressure.

Q Mr. Haseltine, before we get to the next exhibit, what conclusions do you draw from all of the preceding exhibits about which you have testified with regard to responsiveness of Continental wells to line pressure?

A The exhibits very clearly show, in my mind, that the wells responded in some measure initially as you would expect them to and we knew they would, but that response is not sustained again; as a San Juan Basin operator would know normally, that changes in line pressure are not going to result in sustained

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long-term increases in output from given wells, and I think that the exhibits and the numbers that we have shown here clearly point out that the Continental wells did show a response at first, and fell off, and they are still falling.

Q All right. I direct your attention to a tabulation identified for the record as Southern Union Gas Company Exhibit 12, and ask you to explain that exhibit.

A Exhibit 12 is a display of the ratability performance of Southern Union Gas Company in the South Blanco-Pictured Cliffs Pool.

Now, we have here three columns.

The first one is entitled "Market Requirements Mcf and Market Requirement Percentage," and the third one is actual producing percentage.

We have got detailed here by operator totals for the years dating back to 1967.

What we have tabulated here is the share of the market to which each operator was entitled, and compared that with the share of the market he actually got in terms of production.

Now, here is the way we come at these numbers.

Allowables are one thing, but the market is what gets served by gas production. The market is great, then all of the wells stay on the line all of the time.

If the market gets limited, something gets cut back in

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accordance with the Commission proration formula and what we do is estimate our shares at the beginning of the year for all of the Northwest New Mexico area, and then we break it down by pools so that the South Blanco-Pictured Cliffs gets a share of our total Northwest New Mexico market.

We further break it down to operators, and to see that each operator gets his fair share out of our market, out of that pool. The way we prorate that is using the A and A days in exactly the same way that the Commission prorates its gas for allowable purposes. As to marginal wells, we use the last deliverability on record.

If it is an exempt marginal well where we simply don't have a deliverability of record to use, we use an Mcf-D factor that represents its ability to produce to the line to the end that these weaker wells get a market share equal to a hundred percent of what they are able to do, anyway, but the basic method on which we prorate the market to the wells is the same system that the Commission uses for distributing total pool allowable.

I think this is the philosophy upon which this whole business is supposed to work.

Let's look at the specific number. We are talking about Continental, so in '67 our number shows that Continental should have 18 plus percent of our market.

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They only got 15 plus percent.

In 1968 our numbers showed they should have approximately 14 percent.

They got just under 13 percent of the market.

In '69 our numbers would have given them 10.83 percent.

They got 13 percent.

On the next page, 1970, they should have 10.83. They got nearly 13, and in '71 they should have 14.34 percent.

They got about 14.6 percent, so you can't dispatch perfectly in accordance with your market schedule.

Everybody, I think, would realize that and not argue about it, so all you can do is come close, and if you run a producer a year or two under his fair share, you catch him up the next year. You try to keep everybody pretty closely in balance.

Some of those operators--you might point there to Operator Abraham.

He has got two real small wells. It is just almost impossible to keep him down to a hundredth of a share of a market.

You put him on a line. He stays on the line. You take what you can get.

You hope that volume comes to you from those small wells enough to justify changing the charts.

Q Now, over the period shown by this exhibit, in your

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opinion, were Southern Union's takes from Continental's wells in the South Blanco-Pictured Cliffs Pool ratable with its takes from other producers in the Pool?

A Yes. As I pointed out, they ran a little under their share in '67 and '68, but in '69-'70 and '71 they overran their share, so I think they have been treated fairly.

Q They were still getting their share of the market, notwithstanding the difference in line pressures from the various periods about which they have complained?

A As a matter of fact, they got more than their share of the market, if you really get down to a fine pencil on it.

Q Then is it your conclusion that line pressures maintained did not cause a non-ratable take insofar as Continental wells are concerned?

A Line pressures maintained did not alter their ratable treatment and ratable share of the market, and they got everything they were entitled to.

Q I refer you to a graph identified for the record as Southern Union Exhibit No. 13, and ask you that you explain that graph.

A This is the pressure profile or hydraulic gradient, as it has been referred to earlier today, existing in the Jicarilla Gathering System, with the pressure at Dogie Canyon indicated on the extreme left of the plot, and the pressure at some point distant in miles, as indicated on

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the bottom of the graph plotted so that we have here a picture of the hydraulic gradient or the pressure profile throughout that system.

Now, you notice this thing extends out, oh, 22 miles, 23 miles, maybe, and the pressure at the extreme end looks like it is about 200 and, oh, 75, to 285 pounds, something like that.

The pressure at Dogie Canyon is 200 pounds.

These pressures were taken at 12:00 noon December 20, 1971 of the meter charts with the single exception that Dogie Canyon pressure was read at 8:00 o'clock. That is when we get the pressure report in off of that station.

You will notice that over 22 miles we have got about 80 pounds differential. This calculates something in the neighborhood of four pounds of per mile pressure drop in the gathering system.

This is a very conservative number for gathering system design.

Q When you say "very conservative" how does that compare with the usual and customary gathering system as far as pressure gradients?

A Well, it is not unusual to have ten pounds per mile or more, maybe 20 to 30 pounds in the gathering systems.

Q In your opinion, is Continental suffering any discrimination because of the high pressure gradients between the Dogie

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Canyon Compressor Station and Continental Wells?

A No, they are not.

Q The pressure gradient then in your opinion is about what they could expect from a normal gathering system?

A If you get the gradients much closer, why the gas wouldn't flow.

Q Calling your attention to a graph identified for the record as Southern Union Gas Company Exhibit No. 14, I will ask you if you will explain that graph.

A Exhibit No. 14 is for the Lowerie Gathering System, the same data that was on Exhibit No. 13 for the Jicarilla Gathering System, it is a pressure profile.

See, the distance is a good deal shorter.

Our extreme well there, as far as this data is concerned, serves the Lowerie area, the Caulkins area is 16 miles.

We have got a 150, probably 165 pounds at the Dogie Canyon and about 200 pounds in the field's extreme end, say a 40 pound difference in pressure over 16 miles, a gradient of two and a half pounds here per mile.

The one we looked at on Exhibit 13 had four pounds per mile.

These are very, very conservative gradients, and it is hard to fuss about either one.

I think we might point out here, too, that these

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systems date back to the original development in the area, of course, and as time goes by, additional development takes place or it doesn't, and wells sustain their deliverability or they don't.

So you might go in with a rule of thumb of designing for five pounds per mile and by the time we get down here on a Commission case, ten or twenty years later, the gradient is not that; it is something different.

It doesn't mean that we deliberately design to give the Lowerie area a two and a half pound gradient and to enforce a four pound gradient on the Continental.

It reflects, as much as anything else, the decline in flow or the sustained development, or something else. Those things all enter into what determines the pressure gradient at any point in time.

I might mention also that if we equalized pressures, as has been suggested at Dogie Canyon, and say we went to the well, just for example, say we went to a 200 pound suction across the board there on the flow pressure systems at Dogie, we still have got a 40 pound drop or an 80 pound drop back to the extreme Continental well.

On the other hand, if we were at 200 at the suction there for the Lowerie System we would only have about a 40 pound increase in that pressure at the same Caulkins well, so simply equalizing pressures would not achieve an

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equalization of pressures in the field.

There is a geographical distance that can't be over come.

Q Mr. Haseltine, I direct your attention to a document entitled "Natural Gas Purchase Contract," a Southern Union Gas Company numbered 15, and ask you whether that is a true and correct copy of the Natural Gas Purchase Contract originally executed by Humble Oil & Refining Company as the seller and Southern Union Gas Company as the buyer, covering the acreage that is now owned by Continental in the South Blanco-Pictured Cliffs Pool.

MR. KELLAHIN: If the Commission please, we object to any attempt to introduce the gas purchase contract in this proceeding as being immaterial to any issue that has been presented in this case or is capable of being presented in this case.

It is well settled that the New Mexico Oil Conservation Commission can act to prevent waste and in doing so it must protect correlative rights.

The extent of the Commission's authority cannot in any sense of the word pass on the provisions of the gas purchase contract.

If it attempts to examine the prices, pressures, other matters related in that contract, it is going beyond the scope of its authority, and we object to any question along this line.

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MR. MORRIS: He will respond to that argument.

MR. JAMESON: First of all, it is customary in the natural gas industry to write contracts with very strict pressure provisions.

Producers are interested in the pressures, maximum pressures that are going to be imposed upon him and his wells.

Those provisions are customarily introduced in contracts.

If Mr. Kellahin has his way, those pressure provisions in this contract are meaningless. They have no force and effect.

There is no reason to put them in a contract.

Secondly, gathering systems are built on the basis of, they are designed engineeringwise on the basis of pressure provisions that you are going to be required to meet under your applicable gas purchase.

That makes it relevant to this gathering system and the way it is operated.

Thirdly, the pricing and pressure provisions in this contract which are interrelated have a bearing upon whether any discrimination in pressures that might exist is unreasonable.

In other words, what we are saying here is that the pressure provision and pricing provisions that are interrelated in this contract have a bearing upon whether the design and operation of these gathering systems has been reasonable or unreasonable.

The issue of reasonableness or unreasonableness as to facilities afforded by Southern Union is the ultimate issue in

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this case.

We submit the provisions of this contract bear on that issue and are a hundred percent material thereto.

MR. PORTER: The objection is overruled.

MR. KELLAHIN: Rather than making continual objections, I would like the record to show that we do object to this line of questioning regarding this contract or any of its provisions.

MR. PORTER: Mr. Kellahin, the Commission will note your objection to any references to the contract.

DIRECT EXAMINATION
(CONTINUED)

BY MR. MORRIS

Q Mr. Haseltine, I direct your attention to Article 8, Section 1, 2, and 3 of this Natural Gas Purchase Contract, and ask that you just read those provisions.

Article 7, excuse me, not Article 8.

A Article 7?

Q Article 7, Section 1, 2, and 3.

A Since I didn't get to answer your first question, this is a true and correct copy of the contract you talked about.

Q Thank you for straightening me out.

A Article 7, delivery pressure, Section 1, except as hereinafter in this Article 7 provided buyer shall take gas hereunder at natural wellhead pressures, and shall have the right to operate its gathering system to which seller's

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wells on the subject lands are connected on such a basis as will produce a working pressure at each point of delivery up to but not exceeding 600 pounds per square inch gauge.

Section 2, as to each of the gathering systems by means of which buyer may from time to time be purchasing gas produced from any portion of the subject lands, buyer represents that it contemplates a gradual reduction in the pressure in such gathering system consistent with the decline in pressure in the reservoir from which the gas covered hereby is being produced, and agrees from time to time to lower the working pressure in such gathering system consistent with such decline in reservoir pressure to such a pressure (herein referred to as the "maximum gathering pressure") as is necessary to permit at least 80 per cent of all wells producing from such reservoir at the time and connected to buyer's said gathering system to deliver gas into such gathering system. Provided, however, that buyer shall never in any event be obligated to reduce such maximum gathering pressure to less than 200 pounds per square inch gauge or be required to take or pay for gas not deliverable into buyer's gathering system against the maximum gathering pressure maintained therein from time to time in accordance with the provisions of this Article, and provided further that seller at its option and

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expense may at any time increase by compression the pressure of gas from any well or wells covered by this agreement so as to make same deliverable into buyer's gathering system.

"Section 3, it is further recognized by the parties heretc that when there has been a sufficient decline in the pressure of the wells connected to any gathering system of buyer, it may be necessary for buyer to install and operate compression facilities to increase the pressure of the gas delivered to buyer from the wells of seller covered hereby and from the wells of other producers connected to the same gathering system.

In the event compression facilities are so installed and operated by the buyer, the price to be paid by buyer for the gas delivered hereunder shall be adjusted as provided in Section 2 of Article 8 hereof."

Q All right. Now, at this point I will ask you whether within your knowledge has Southern Union ever operated its gathering system in the Cliffs at a gathering system that denied or rather that did not permit a minimum of 80 percent of the wells connected with the gathering system to produce gas?

A We have always operated at such a pressure, at least 80 percent of the wells will produce.

Q The fact is the figure probably always has been higher than that 80 percent?

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A The figure has been almost 100 percent.

Q Now, as to the general matter of economics, what is the relative difference in value to a gas buyer of high pressure gas and low pressure gas?

A The difference in value is the cost of the compression.

MR. KELLAHIN: There is no testimony about any high pressure gas being involved in this hearing. We are talking about the South Blanco-Pictured Cliffs Pool.

The only pressures we have been shown here today are all on the order of an equal, substantially equal pressure.

There is no basis for any question about high pressure versus low pressure gas involved in this proceeding.

MR. MORRIS: I will just withdraw that question, to save a ruling on it.

Q (By Mr. Morris) Mr. Haseltine, I direct your attention to the provisions of Article 8 of Section 1, entitled "Price" Schedule in the Contract, and ask you whether that price schedule is the one that customarily Southern Union has paid for the Pictured Cliff gas in the San Juan Basin?

A No, this price schedule is 2¢ higher in all its brackets than the prices in the prices paid for Pictured Cliff gas in the San Juan Basin.

Q What is the difference for that two cents difference?

A The difference is the right that Southern Union has, in terms of the contract provisions we just read, which allowed

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Southern Union to gather the gas at pressures up to 600 pounds.

MR. KELLAHIN: Mr. Commissioner, we object to this line of questioning because the other contracts are not before the Commission. We don't know what price we are paying. There has been no price given the Commission, what prices are being paid under any contract under this one--

MR. MORRIS: Mr. Haseltine has already testified and qualified himself as manager of gas supplies, with complete jurisdiction over payment to all producers in the San Juan Basin. That is his job, to see that everyone gets paid the proper rate for his gas. He is well qualified to testify on gas prices being paid.

MR.KELLAHIN: It is a fundamental rule of evidence that a contract itself is the best evidence. If he has a contract, he should produce it and let us see what the prices and what the other provisions are.

MR. PORTER: Mr. Kellahin, the Commission will overrule your objection.

Q (By Mr. Morris) Now, Mr. Haseltine, I ask you to read the provisions of Section 2 of Article 8 of the contract.

A Article 8 is entitled "Price." Section 2 reads this way:

"In the event, as contemplated by Section 3 of Article 7 hereof, buyer installs compression facilities to increase the pressure of gas deliverable hereunder from one or more

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of seller's wells located on the subject lands described in Exhibit A hereto, the price of all gas thereafter delivered hereunder and compressed in such facilities by buyer shall be reduced as follows."

There are two columns there that follow.

The first one is entitled "Maximum Gathering Pressure in Pounds per square inch gauge," and the second one is entitled "Reduction in Price per Mcf, 500 or over, non--- What I am reading here, the maximum gathering pressure first, and then reduction in price allowed. "At least 400 but less than 500, three-fourths cents; at least 300, but less than 400 one and one-fourths cents. At least 200, but less than 300, one and three-fourths cents.

Q From the provisions that you have just read in this contract, Mr. Haseltine, are the prices to be paid to be varied depending upon the pressure that your Southern Union maintains or is entitled to maintain in its gathering systems?

A Yes, the prices paid are directly tied to the pressure at which we operate the gathering system.

Q All right now, Mr. Haseltine, I call your attention to Article 21 of this contract entitled "Material," and ask you to read that.

A That is at the top of page 17, Article 21 of the agreement.

"This agreement shall be effective from and after the

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date hereof and unless sooner terminated as hereinabove provided shall remain in effect until December 31, 1975, and thereafter from year to year until terminated as of the end of any calendar year by written notice given by either party hereto to the other at least sixty days prior to the termination fixed in such notice."

Q Under this provision does Southern Union have any assurance that Continental gas will be available to it after December 31, 1975?

A No assurance whatever that Continental gas will be available to it after December 31, 1975.

You asked me a question a few minutes ago. I would like to reply to that a little more fully.

You asked why this contract contains a Pictured Cliffs base price schedule that is two cents higher than we normally offer in the Basin.

What I said was correct, but I want to go a little farther than that.

We have the right under this agreement to gather gas at pressures up to 600 pounds.

Most of our contracts provide that we have no right to gather at pressures above 250 pounds.

This is the essential difference in the pricing provisions.

Q Mr. Haseltine, I direct your attention to a tabulation

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entitled "1971 Average Price," identified for the record as Southern Union Gas Company Exhibit No. 16, and ask that you explain what that exhibit is.

A That is a tabulation by month of the price paid for the gas received from each of the wells shown on the tabulation, this being the South Blanco-Pictured Cliffs group of wells. You will notice that the Caulkins there is one of the groups we want to look at.

The Caulkins wells have received prices of 13.0 cents per Mcf. There is a single exception to that. A well that didn't quite receive that much, and that relates to the fact that we do not have all of that particular well under a contract, but basically the Caulkins wells are all receiving 13.0 cents per Mcf.

Skip on over to the last page, and the last five wells on the last page, these are Southern Union Production Company South Blanco-P.C. wells connected to the Ballard system. That is the system that runs directly west of Dogie Canyon and goes all of the way up to the Township 27-6, I believe that is.

Those are under a similar contract, similar pricing provisions to the Caulkins contract.

They received a 13.0 price also.

You will notice the production company wells above, those bottom five, receive prices that vary from time to

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time and are in excess of 13 cents.

Now, turn to the Continental wells, some on page 1 and some on page 2, and you will notice they also receive a price above 13 cents, and those prices vary from time to time on any given well.

I see prices in there ranging up to 14.3 cents.

These wells, both Southern Union Production Company Jicarilla wells and all of the Continental wells are wells subject to this high pressure Pictured Cliffs pricing provision, with the further provision in those same contracts that allows reduction in price as the gathering system pressure declines.

Q Does this exhibit reflect that although the Continental wells had been producing against a higher gathering system pressure than the Caulkins wells, Continental has in effect been paid the higher price in recognition of that pressure?

A That is right. The Caulkins wells have been paid a higher price because of those provisions in their contract because of the higher operating pressure in the gathering system.

Q Mr. Haseltine, I direct your attention to the table entitled "South Blanco-Pictured Cliffs base contracts." It is identified for the record as Southern Union Gas Company Exhibit 17. I will ask you to explain that exhibit.

A This exhibit is a comparison of the basic contracts whereunder we buy gas from the South Blanco-Pictured Cliffs Pool.

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The operators of the various wells are listed there first, and then our company contract number, the date of the contract, and then the provision as to term, and the last column is the formation covered.

I would point out here that as you go down under the column called "Term," you will notice that the Abraham contract has a termination date in '84, and thereafter as long as gas is or can be produced. It is a life of lease contract, as long as gas is there, we have got a contract on it. The particular contract is extended thereafter so long as gas is producible in commercially usable volumes.

Continental does not have that provision. They can terminate it on notice, with the first termination privilege being accorded 12-31-75, the two Mead contracts have about the same kind of provision.

Mead can cancel and terminate his contracts November 1, '76, or on the anniversary dates thereafter, with notice.

This really isn't the same type of concern we're talking about with the Continental contract because the gathering system that serves the Mead wells--there are only four of those--the gathering system that serves those wells serves a great number of wells other than that.

Now, then going down into the production company contract, its life of lease provides that extends as long as

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gas can be produced, and there the other production company contract is the same thing there, life of the lease.

Q Mr. Haseltine, how does the relatively short term for which the Continental contract is to continue affect the economics of the capital investment in the gathering system for taking gas from the Continental wells?

A Well, there are approximately four years left under the Continental contract, and any kind of pay-out for facilities that would be installed to serve those wells specifically would have to be amortized, any kind of investment would have to be amortized in the four years of the term remaining.

For small gathering systems, the amortization schedule respectively is ten to twenty years or more, and of course, pipeline facilities are amortized over even longer periods.

Q Mr. Haseltine, I will ask you this question: Continental made a lot of comparisons between its wells and the Caulkins wells, taking into consideration the relative remaining contract terms, the Caulkins wells contracts and the Continental well contracts, do you consider in your opinion that the pressure differentials that our previous exhibits show between those wells, are reasonable?

MR. KELLAHIN: We object to the question. We made no comparison of our wells to the Caulkins wells. Our comparison was for the purpose of showing the comparability of those wells as against the pressure, and had nothing to do with the premise

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that has been laid in this question.

MR. MORRIS: I laid the premise in this question on the basis of their testimony of differences in pressure between the two wells, that are between the Caulkins group of wells and the Continental wells. That is between the Caulkins group of wells and the Continental wells, the question is whether, in light of the remaining contract terms and the two applicable contracts, that pressure differential in his opinion is reasonable. I think it is entirely a proper question in light of the Continental's direct case.

MR. PORTER: The objection is overruled.

THE WITNESS: Yes, the pressure differential is totally reasonable viewing all of the facts we have talked about here today.

Q (By Mr. Morris) Now, Mr. Haseltine, in Continental's direct testimony reference was made to the Commission procedures for deliverability testing and the procedure that Continental followed in their deliverability testing, with the implication that the de facto result from the Commission deliverability formula was the deliverability of the Continental wells. Do you have any comment on that testimony?

A Yes. It seems to me that they have a quarrel with the validity of the Commission testing procedure.

I find nothing in the Commission testing procedure

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that is here before us that relates to line pressure except the single requirement that the line pressure be more than 75 percent of the shut-in. If that condition is met during the pre-condition flow period, then regardless of the line pressure, the testing is to be made, and that is the test. If an operator can manipulate a test by running a compressor on a well for three weeks, jerk it out on a skid and get a deliverability that gets him allowable, as I believe I heard someone say, well, then I think their quarrel is with the application of the formula, not with our line pressure. I don't see anything in the Commission order R33F, or any of the memos that the Commission has sent out since then, applying to that, that recognizes that a manipulation of line pressure is going to give a higher or lower D.

In fact, I think it is quite to the contrary. I think the Commission established on the evidence they have heard many many times, they established the exponent of the back pressure curve. And they established the deliverability formula using that exponent, and said that as a general rule for all wells this would work, and we have no quarrel with that. I kind of feel like I am trying to defend a quarrel here that ought not to be directed at Southern Union.

Q Mr. Haseltine, were Southern Union Exhibits No. 1 through

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17 inclusive, with the exception of the Gas Purchase Contract, prepared by you or under your supervision?

A Yes, they were.

MR. MORRIS: At this time we would like to offer in evidence South Union Gas Company Exhibits 1 through 17 inclusive.

MR. PORTER: Were there any objections to the admission of these exhibits?

MR. KELLAHIN: If the Commission please, we do object to the admission of Exhibit 15, the Gas Contract, for the reason we previously stated.

We also object to the admission of Exhibits 16 and 17, which purports to be excerpts from contracts which are not before the Commission, and we submit that the best evidence would be the contracts.

MR. JAMESON: Mr. Porter, in response to that objection, we did not anticipate that Continental would like to have all of our contracts in evidence. We do have a single copy of each of our contracts. It is available for their inspection. It is available to the Commission for inspection.

We will be glad to duplicate them and put them in evidence, if Mr. Kellahin wants them in evidence. We didn't feel, however, as a part of our case that it would be necessary to do so, but we have no objection to doing that.

MR. PORTER: It appears that Mr. Kellahin doesn't want the contracts you have already offered.

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MR. JAMESON: I might mention one other thing with reference to Exhibits 16 and 17.

I believe under previous Commission practice it has been under--where the original document was available for inspection. That we have available for inspection.

MR. PORTER: The exhibits as offered will be admitted and Mr. Kellahin, your objection to those specific exhibits 15 and 16--17 will be noted.

MR. JAMESON: I believe that will conclude our testimony with regard to this one witness. We are ready to call our next witness, subject to cross-examination, of course.

MR. PORTER: The witness is now available for cross-examination.

(Whereupon a brief off the record discussion was held, after which proceedings were recessed until January 27.)

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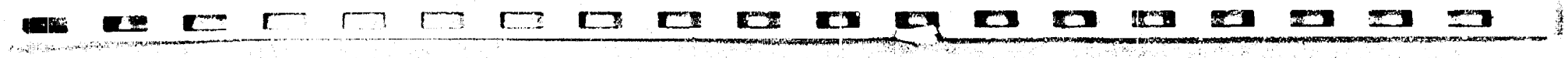
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STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

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

CERTIFIED SHORTHAND REPORTER



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. 4628
Order No. R-4293

APPLICATION OF CONTINENTAL OIL
COMPANY FOR AN ORDER OR ORDERS TO
ENSURE RATABLE TAKING OF GAS AND
AN EXCEPTION TO ORDER NO. R-1670,
RIO ARRIBA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m., January 26, 1972, and on January 27, 1972, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 26th day of April, 1972, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

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

(2) That the applicant, Continental Oil Company, is the operator of the AXI Apache Leases, located in Township 25 North, Ranges 4 and 5 West, NMPM, Rio Arriba County, New Mexico, under leases from the Apache Indian Tribe, and has wells completed in and producing from the South Blanco-Pictured Cliffs Gas Pool.

(3) Southern Union Gas Company owns and operates a gas gathering system in the South Blanco-Pictured Cliffs Pool, Rio Arriba County, New Mexico, to which system one hundred eighteen (118) gas wells in said pool are connected including thirty-one wells owned and operated by Continental Oil Company.

(4) That the South Blanco-Pictured Cliffs Pool is a separate common source of supply of gas, as defined by the Commission, and its production is prorated pursuant to the provisions of Commission Order No. R-1670, as amended.

(5) That under the provisions of Section 65-3-15, New Mexico Statutes, Annotated, 1953 Compilation, as amended, Southern Union Gas Company is a common purchaser of gas in the South Blanco-Pictured Cliffs Pool, subject to the provisions of said Section 65-3-15, NMSA, and to the provisions of Rule 902 of the Commission's Rules and Regulations.

(6) That the applicant seeks the promulgation of the necessary order or orders that will ensure the ratable taking of gas by Southern Union Gas Company from gas wells in the South Blanco-Pictured Cliffs Pool, Rio Arriba County, New Mexico, as required by law, and by the Commission's Rules and Regulations.

(7) Applicant further seeks as an exception to the provisions of Order No. R-1670, as amended, the reclassification of certain of its wells from marginal to non-marginal status, together with authority to carry underproduction for said wells forward from balancing period to balancing period without cancellation as long as the wells remain classified non-marginal.

(8) That under the provisions of said statutes, and Rule 902, a common purchaser is required to purchase without unreasonable discrimination in favor of one producer against another in the price paid, the quantities purchased, the bases of measurement of the gas, or the gas transportation facilities afforded for gas of like quantity, quality and pressure available from such wells. Said statute further requires that a common purchaser taking gas produced from gas wells from a common source of supply shall take ratably under such rules, regulations and orders, concerning quantity, as may be promulgated by the Commission consistent with the act.

(9) It is the duty of the Commission to enforce the provisions of this act, and it is vested with the power, after notice and hearing, to make rules, regulations and orders for that purpose.

(10) That under the provisions of Order No. R-1670, production from the South Blanco-Pictured Cliffs Pool is prorated in order to give each operator in the pool the opportunity, insofar as practicable, to produce his fair share of the gas underlying his tract.

(11) That under the provisions of Order No. R-1670, Rule 16(b), the Secretary-Director of the Commission may reclassify a marginal or non-marginal well at any time the well's production data, deliverability data, or other evidence as to the well's producing ability justifies such reclassification.

(12) That Southern Union Gas Company's pipeline gathering system extends across some ten townships, with compressor facilities located down-stream from applicant's wells and the wells of other producers in the pool.

(13) That the compressor station for the gas gathering system is located in Section 4, Township 25 North, Range 6 West.

(14) That the Lowry section of the gathering system extends north from the compressor station to South Blanco-Pictured Cliffs wells located in Township 26 North, Ranges 6 and 7 West.

(15) That the Ballard section of the gathering system extends West and North from the compressor station to South Blanco-Pictured Cliffs wells located in Township 27 North, Range 8 West.

(16) That the Jicarilla section of the gathering system extends east from the compressor station to South Blanco-Pictured Cliffs wells located in Townships 25 and 26 North, Ranges 3, 4, and 5 West.

(17) That Continental's wells are connected to the Jicarilla section of the gathering system.

(18) That during the first nine months of 1971, monthly average pipeline pressures against which wells owned by Continental Oil Company had to produce ranged from 355 psi to 423 psi, while monthly average pipeline pressures against which wells connected to the Lowry section of Southern Union's gathering system had to produce ranged from 205 psi to 295 psi, thereby creating a pressure differential favoring said Lowry section averaging 143 psi.

(19) In October, 1971, Southern Union Gas Company installed and placed into operation approximately five miles of 12-inch loop line on the trunk of its Jicarilla section that serves Continental's wells and a substantial addition to its compressor facilities which serve Southern Union's gas gathering system in the South Blanco-Pictured Cliffs Pool, including that portion of the system to which Continental's wells are connected.

(20) That during the eight-day period ending January 9, 1972, the daily average pipeline pressures against which wells owned by Continental Oil Company had to produce ranged from 210 psi to 337 psi while the daily average pipeline pressures against which wells connected to the Lowry section of Southern Union's gathering system had to produce ranged from 165 psi to 249 psi, thereby creating a pressure differential favoring said Lowry section averaging 64 psi.

(21) That the differential in line pressure between the Jicarilla section and the Ballard and Lowry sections has been substantially reduced by installation of the loop line and additional compressor facilities.

(22) That the wells owned by Continental Oil Company in the South Blanco-Pictured Cliffs Pool are producing from a portion of the pool having generally less sand thickness and less sand development than the wells of producers connected to the Lowry section of the gathering system.

(23) That based upon said sand thickness and sand development, there is a greater quantity of gas available from wells connected to the Lowry section of the gathering system than from the Continental wells connected to the Jicarilla section of the gathering system.

(24) That gas produced by wells belonging to Continental Oil Company will be available to Southern Union Gas Company until December 31, 1975.

(25) That gas produced by practically all wells connected to the Lowry section will be available to Southern Union Gas Company until February 1, 1984 and for so long thereafter as gas is or can be produced from one or more subject wells.

(26) That gas will be available to Southern Union Gas Company from wells connected to the Ballard section as long as gas is or can be produced from a well or proration unit on any portion of such lands or as long as any of seller's leases or leasehold rights or any renewals or extensions thereof shall remain in force and effect.

(27) That gas will be available to Southern Union Gas Company from wells connected to the Ballard and Lowry sections for a relatively longer period of time than gas will be available from Continental's wells connected to the Jicarilla section.

(28) That considering the quantity of gas available and the relative length of time such gas will be available to Southern Union Gas Company, a difference of approximately 64 psig in line pressures between the Jicarilla section and the Ballard and Lowry sections of the gas gathering system does not constitute an unreasonable difference in transportation facilities afforded.

(29) That Southern Union Gas Company takes gas from the various gas producers connected to its system in the South Blanco-Pictured Cliffs Pool in accordance with a ratable-share procedure established by Southern Union Gas Company which takes into consideration allowables assigned by the Commission.

(30) That Southern Union Gas Company is taking gas ratably from the various gas producers connected to its system in the South Blanco-Pictured Cliffs Pool.

(31) That the applicant's request for the promulgation of the necessary order or orders that will ensure the ratable taking of gas by Southern Union Gas Company should be denied.

(32) That considering the quantity of gas available and the relative length of time such gas will be available to Southern Union Gas Company, a difference in line pressures substantially in excess of 64 psig existing between the Jicarilla section and the Ballard and Lowry sections of the gas gathering system prior to installation of the loop line and additional compression facilities constituted an unreasonable difference in transportation facilities afforded.

(33) That wells belonging to Continental Oil Company and connected to the Jicarilla section of the system would have produced more gas during the period from January 1, 1971, to date of installation of the loop line and additional compressor facilities, but for the unreasonable difference in transportation facilities afforded.

(34) That in order to afford Continental Oil Company the opportunity to produce said additional gas, the wells belonging to Continental Oil Company connected to the Jicarilla section of the gas gathering system should be reclassified non-marginal and their statuses adjusted as of January 1, 1971, and should not be subject to reclassification and cancellation until the first balancing period beginning in 1973.

(35) That the applicant's request for authority to carry underproduction for said wells forward from balancing period to balancing period without cancellation as long as said wells remain classified non-marginal should be denied.

IT IS THEREFORE ORDERED:

(1) That the application of Continental Oil Company for the promulgation of the necessary order or orders to ensure the ratable taking of gas by Southern Union Gas Company is hereby denied.

(2) That effective as of January 1, 1971, the following-described wells belonging to Continental Oil Company in the South Blanco-Pictured Cliffs Pool, Rio Arriba County, New Mexico, are hereby reclassified non-marginal and the status of each adjusted accordingly:

Well Name	No.	Unit	Section	Township	Range
AXI Apache J	1	D	5	25N	5W
AXI Apache J	2	P	5	25N	5W
AXI Apache J	3	E	6	25N	5W
AXI Apache J	5	D	7	25N	5W
AXI Apache J	6	P	7	25N	5W
AXI Apache J	7	D	8	25N	5W

Well Name	No.	Unit	Section	Township	Range
AXI Apache J	8	P	8	25N	5W
AXI Apache J	10	A	5	25N	5W
AXI Apache J	11	A	6	25N	5W
AXI Apache J	12	K	5	25N	5W
AXI Apache K	2	B	4	26N	5W
AXI Apache K	3	A	9	26N	5W
AXI Apache K	4	M	3	26N	5W
AXI Apache K	5	H	10	26N	5W
AXI Apache L	1	M	36	25N	4W
AXI Apache L	2	A	36	25N	4W
AXI Apache L	3	M	35	25N	4W
AXI Apache L	4	M	26	25N	4W
AXI Apache L	5	A	26	25N	4W
AXI Apache L	6	A	25	25N	4W
AXI Apache M	1	M	23	25N	4W
AXI Apache M	3	A	13	25N	4W
AXI Apache M	4	I	24	25N	4W
AXI Apache N	1	A	11	25N	4W
AXI Apache N	3	A	12	25N	4W
AXI Apache N	4	D	12	25N	4W
AXI Apache N	5	M	1	25N	4W
AXI Apache N	6	P	1	25N	4W
AXI Apache N	7	M	12	25N	4W
AXI Apache N	8	P	2	25N	4W
AXI Apache C	1	A	10	25N	4W

(3) That the wells described in Order (2), above, shall be subject to reclassification and cancellation at the first balancing period beginning in January, 1973.

(4) That the application of Continental Oil Company for authority to carry underproduction for the wells described in Order (2), above, forward from balancing period to balancing period without cancellation as long as said wells remain classified non-marginal is hereby denied.

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

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

BRUCE KING, Chairman

ALEX J. ARMIJO, Member

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

S E A L

dr/

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO
January 27, 1972

SPECIAL HEARING

IN THE MATTER OF:

Application of Continental Oil Company for an order to ensure ratable taking of gas and an exception to Order No. R-1670, Rio Arriba County, New Mexico

Case No. 4628

BEFORE:

State Geologist A. L. Porter, Jr.,
Secretary-Director.

TRANSCRIPT OF HEARING
Volume II

January 27 9:00 A.M.

MR. PORTER: The hearing will come to order, please. Mr. Haseltine, I believe you were on the stand, even though your attorney would agree to waive cross-examination, somebody would like to ask you a few questions.

CROSS-EXAMINATION

BY MR. KELLAHIN

Q Mr. Haseltine, in connection with your Exhibit No. 1, do you--I believe you testified you omitted one of the lines coming in from the north that designated the Taylor Company

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line; is that correct?

A That is correct.

Q This is a high pressure line?

A Yes.

Q What is the pressure in that line?

A I am not sure what the pressure runs all of the time.

Q Approximately?

A Basically it is a 500 pound system.

Q 500 pounds, and it could be higher or lower?

A Yes.

Q Generally in that vicinity?

A Yes.

Q Is that line connected to any Pictured Cliffs wells?

A I think there is one Pictured Cliffs well in that system.

Q Actually, aren't there two?

A Well, I only think there is one. There may be two. We made some special trade offs when we divided that system and hooked some Dakota wells to the low pressure, and hooked some P. C.'s to the high pressures, as a trade off in renegotiation.

Q I call your attention to the Breach F12 and the Breach F8, which are in Section 34 and Section 35, and 27 North, 6 West. Would you agree they are connected to your high pressure line?

A Would you give me those again?

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Q Breach F27, Breach F8 location? 35-4 and 34 in 27 North Range 6.

A Yes, I believe that is correct.

Q Do you know anything about the ability of those wells to produce?

A Oh, in specific terms, no. They are about like the other South Blanco-P. C. wells in that Caulkins area. They are marginal wells.

I would have to look at the schedule to see if the schedule shows they are marginal.

Q You would agree to that, I assume, the official records of the Oil Conservation Commission?

A That is what determines the marginal wells, the official records of the Oil Conservation Commission.

Q And also the pressure in the pipeline, is it not?

A Not to my knowledge.

Q Not to your knowledge, but they are bucking 500 pounds more or less of pressure?

A They are bucking whatever is in the high pressure system, that is correct.

Q You don't know exactly what it is?

A It is around 500.

Q Now, turning to your Exhibit No. 2, Mr. Haseltine, that is a diagrammatic sketch of the compression installation at Dogie Canyon.

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What, specifically, are the pressures on the intake and discharge side of those compressors; is that design pressure or actually working pressures?

A Those pressures that I have designated on that Exhibit No. 2, as I testified, I believe are approximately current operating pressures.

They represent a typical pressure. If you would go out there today, that is about what you would find.

Q Do you have then a pressure of 320 pounds coming off of the reciprocals and the two Solar compressors and an intake of 320 on the 300 hp Solar. Is that what you are--

A There are no 300 hp.

Q What is that 300 number for?

A 3,000. What was the question?

Q You have the same outlet pressure on your other compressor as you have on the intake side of the 3,000 hp compressor?

A Yes.

Q You have no pressure drop across there at all?

A There is some minor drop. We are talking about the typical normal pressure that you would find, sure, you have some drop through 15 or 20 feet of the line in through it. There is cooling equipment in between the discharge of the first three compressors and the suction on the fourth compressor, too.

Q You would have quite a little bit of drop then? When that

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gas is cooled, the pressure drops, does it not?

A No.

Q It doesn't?

A No.

Q You mean the cooler gas has a higher pressure than the heated gas coming out of the first stage?

A Temperatures of gas is totaled independent of pressures of gas.

Q You have a pressure drop of at least five pounds across there?

A I will give you five pounds.

Q Thank you.

Now, you show the cargo line coming into the station.

You haven't given us the pressure on the intake side of that line. What is it?

A 320. That is what we showed in on there, through that manifold.

Q At the point you connect to your Solar compressor is 320 pounds?

A Yes.

Q This is your 500 pound line?

A 500 pound system.

Q 500 pound system. How do you get a pressure drop of 300 pounds from 500 on your upper end to 320 down here?

A That is not a 300 pound drop.

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Q I didn't say a 300 pound drop. I think I said how do you account for the pressure drop of that magnitude in that system?

A Pressure drop is a function of flow and the size of the facility.

Q Well, what is the size of the facility?

A I think that is another 10-inch trunk that runs out there, but I am not sure.

Q So, you have considerably more of a pressure drop on that line than you do on your other ten lines connected to the Pictured Cliffs; is that correct?

A I suspect that is right.

Q Where is that line actually physically connected; is it connected at the compressor station or is it connected to a portion of your pipeline system as shown on Exhibit 1?

A Well, now, I don't understand that question.

Q Where does your Largo line come into this compressor system? Are you connected at the compressor facility at Dogie Canyon or are you connected to some portion of the Pictured Cliffs pipeline shown on your Exhibit 1?

A No, the Largo system comes in separately, the Dogie Canyon Compressor Station facility.

Q It is an entirely separate pipeline? There is a lot of inner-connecting, manifolding to provide flexibility in this Dogie Canyon Station?

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A At the station, yes.

Q Now, Mr. Haseltine, how long have you been associated with and known about the problems that existed at this Dogie Canyon Station?

A Well, I have associated with the total operation, including the Dogie Canyon Compressor Station and all facilities in that area, why, for ten or 12 years.

Q And did you have anything to do then with the redesigning of the facilities there?

A Of the Caulkins area system?

Q Well, the Caulkins area system, the Continental area system, the entire system?

A Well, insofar as the gas supply functions that have been previously described, in the decision making process that leads to the purchase of facilities, yes, sir, I have some impact on that. Now, I did not design the equipment, nor did I place the order.

Q Now, how long have you known about Continental Oil Company's problems as they have been related to you in this respect?

A Continental first contacted us, I think, about last April or May. Now, I could stand some correction on that, but it was early in '71.

Q You don't recall a letter written in 1970, December?

A They wrote in 1970, December, asking about operations down in Belen, which is not part of this case. They may have

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written something else in that letter, but possibly that was the earliest contact they made on this.

Q If we assume that it was, you would have known about their situation in 1970. When was this facility designed, as shown on Exhibit 2?

A When was it designed?

Q Yes.

A I don't know when it was completed. The concept was approved in the fall of 1970.

Q The fall of '70?

A Yes.

Q When was the system arrangement installed?

A We are still talking about the work that culminated--

Q Is that what you have got there today?

A Well, we have got to be precise about this. The work that is there today, some of it began many, many years ago.

Q Yes.

A Now, if you are talking about the construction that went on in the summer of '71, why then we can talk about that. I have to know what precise thing you are talking about.

Q Let's talk about the most recent construction, which I assume is the summer of '71. When was that installed?

A In the summer of '71.

Q What period, June, July, August?

A Construction work was under way generally in the months of,

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I think July, August, September.

Q Now, did you or did you not know of the complaints Continental Oil Company had at the time this installation was proposed?

A At the time the installation was first proposed? And conceived?

Q Yes.

A No.

Q Did you ever look at the production situation on those two segments of your line?

A Certainly.

Q Before you designed this?

A Certainly.

Q You didn't know that Continental had a problem, although you looked at it?

A We don't recognize that as a problem today.

Q You don't? I see.

You did recognize the pressure differential that exists between the two segments of the line at the time this installation was made?

A We recognized that pressure differentials existed going back to the time Conoco acquired the property.

Q And it still exists today?

A Yes.

Q As far as you are concerned, you hope it will continue to

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exist; is this your testimony?

A No, I don't hope the pressure differential does or does not continue to exist.

Q Now, referring again to your Exhibit 2, I think you have already answered that question. I'm sorry. I will go to my next one.

You say these are actually working pressures that are shown on here and not design pressures?

A These are the typical pressures operating there today.

Q You testified that there would be a great deal of difficulty in revising the Dogie Station using the existing compressors?

A I testified there would be a great deal of difference in equalizing the suction pressure by simple manifolding across the three small compressors with the existing Dogie Caynon facilities.

Q Is there any other alternative than manifolding, as you describe?

A To equalize pressure?

Q Yes, sir.

A Not without substantial expenditures of money.

Q You testified you knew about the gathering system disparity as related by Continental before this system was installed?

A Yes.

Q But you didn't do anything about the curing of that

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situation at the time you installed it?

A You didn't ask me a question.

Q Yes, I did. You didn't, did you?

A Well, I understood you just to make a statement that I did.

Q You didn't?

A If you are asking.

Q I am asking, did you?

A Certainly we knew the disparity between the systems. That is why we installed the facility.

Q I said you didn't do anything about curing the situation, did you?

A Well, I think we have testified that the equipment we put in.

Q Now, could you have not designed the system so that substantially equal pressures could have been established on these two segments of the line?

A We could have. In fact, we could have gone farther in design for a lower pressure on the east system.

Q You could have bought a larger compressor, could you?

A Sure.

Q Had you bought a larger compressor, it would have reduced the amount of work the other compressors are doing, would it not?

A Not necessarily.

Q Not necessarily?

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A No.
Q Now, you just chose to ignore the pressure variation in the two segments; isn't that the fact?
A No.
Q You considered this, but you didn't cure it?
A Didn't cure the pressure?
Q Is this your testimony--I beg your pardon--you say you didn't ignore the pressure differential?
A No. We knew that the pressure differential existed.
Q Yes, but you did not cure that pressure differential, did you?
A In total?
Q Yes.
A No, we have never represented that we did.
Q I believe you testified yesterday that the maximum ratio of the centrifugal compressor is 1.75; is that the maximum design ratio as recommended by the manufacturer for the wheels that are in it?
A For the wheels that are in it.
Q Now, the Solar could have been installed on there, the Saturn compressor AC-16 casing that will accommodate this ratio?
A I don't know. I don't buy those compressors.
Q If the Solar could furnish such equipment with a compression range of 1.1 to 2.8, it would have considerably improved the

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situation, would it not?

A Improved what situation?

Q You would have had a higher compression ratio and it could have reduced the line pressures in this system?

A You are talking about a lot of things besides design ratio. You are talking about hp, response of a system to lower line pressure. You are talking about cost. You are talking about a lot of factors. Now, to say that it would have alleviated some problems, you have got to kind of define the problem.

Q I think we have defined the problem. I think you have already testified you do not choose to recognize it as a problem, so we won't pursue that question.

Now, turning to Exhibit No. 3, that shows the average pressures. Did you come up with the average pressure for Continental oil well company's wells?

A This was prepared under my supervision, yes.

Q Now, did you make a computation of the total average?

A This is the average per well, as I understand it. Of the total average?

Q Yes, sir. You testified yesterday, I believe, just to refresh your recollection, that Continental wells averaged during the month of November 282 pounds?

A Yes.

Q And in December, 273 pounds?

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A Yes.

Q What is the average for Caulkins for that same period?

A I don't have that number.

Q What is the average for Southern Union Production for that same period?

A I don't have that number.

Q You didn't choose to compare the pressures in the system?

A No. Be glad to make that computation. It is not tough. You add them up and divide by the number of wells.

Q You agree that just changing the pressures shown on your exhibit, the average would be somewhat lower for both Caulkins and Southern Union?

A Average?

Q Average.

A Yes, we have testified to that fact.

Let me back up here. If we are talking about Production Company wells on the top end of the Ballard System, yes; if you are talking about Production Company wells in the Tapacito area or Jicarilla area, why the Continental wells are--no, I'm not ready to agree that the Continental wells are particularly facing a higher pressure than those same group of Production Company wells are. They are all feeding the same system.

Q When you are talking about the same group, are you talking about the Pictured Cliffs or the Tapacito?

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A I am talking about the South Blanco-Pictured Cliffs wells. This system is still called the Tapacito or Jicarilla system.

Q The Navajo Indian wells are in the Ballard system and have lower pressure; is that correct?

A Yes. Let's look at that exhibit to see we get this matter straight here.

Q O.K.

A Exhibit 3, the Caulkins wells, feed the Jicarilla system--pardon me--the Continental wells feed the Jicarilla system, and they do exhibit pressures in the range of 282 and 273 for the months of November and December.

The Southern Union Production Company wells that are all named Jicarilla wells, there are probably 20 of them or 25 of those, are in the same Jicarilla system with Continental wells, and their average pressure for the months of November and December would be at least as high, possibly higher, than the pressures at which the Continental wells are flowing.

Q Tell me, Mr. Haseltine,--

A If I may, we haven't finished what you brought up here on this exhibit, the Navajo Indian wells belonging to Southern Union Production Company produced to the low pressure systems as to the Caulkins wells and the average producing pressure on those wells, both Caulkins and the Southern

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Union Production Company Navajo wells would be a lower pressure for the months of November and December than the comparable pressure for Continental and Southern Union Production Company Jicarilla wells.

Q It is your testimony you are furnishing different facilities for Continental and Southern Union than you are furnishing to Caulkins and the Navajo wells operated by Southern Union.

A Different facilities?

Q Yes.

A Yes, we are furnishing different facilities.

Q Now, if you were required or if you did reduce the pressures available to Continental Oil Company to the 200 pound area you would pay no more for the gas, would you?

A No more than the price paid?

Q Now?

A As long as they are in the 200 to 300 pound bracket they get a price.

Q If you got 290 pounds, you are paying the same price as if you had 210 pounds?

A That is right.

Q A 90 pound reduction in pressure wouldn't make a difference in price of the gas?

A Only if you are dropping from 200 to 210. If you are dropping 350 to 240--

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Q It makes a difference?

A I think probably Continental has still one or two in the 300 pound bracket. I see a November reading of 300 on several of their wells.

Q Now, referring to your next exhibit, Exhibit No. 4, did you average those pressures?

A They were done under my supervision.

Q But you didn't make an average for each of the operators involved here, did you?

A No.

Q Wouldn't that be a significant factor in dealing with different operators as you were doing in this field?

A The reason I developed some averages for Continental was not to compare at that point the difference between their pressures and some other operators. The purpose was to show the continued decline in pressure and volume that is occurring in production from their wells.

Q We will come to volumes later, but we showed from, on your two months, two reading pressure drops of about ten pounds on Continental wells; isn't that correct?

A Yes.

Q At the same time, would you agree, that Caulkins shows a drop from 201 pounds to 194?

A Well, that is possible. I would just have to add those two columns, divide them out, and see.

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Q If we had averaged that, would you say that sounds reasonable?

A It sounds reasonable. I am not going to argue that it is wrong or right.

Q So we still have a pressure differential between the two operators?

A Yes.

Q Now, on Exhibit No. 5, which is the production for 1971, could you estimate what Continental Oil Company's production would have been if the pressures had been the same as those afforded to Caulkins?

A No, because we have dropped the pressure substantially on Continental wells and production is still falling.

As I testified yesterday, I don't know whether it is going to bottom out.

Q Would you agree that with reduced pressures Continental would have produced more gas?

A That is precisely just what I just got through testifying to. We have reduced the pressure itself.

Q They have produced more gas, have they not?

A More than what?

Q More than they were producing before you reduced the pressures?

A No. November was more than they produced, let's say last January or February, but December, with a still lower line

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pressure, was less than they produced in November.

Q Now, let's skip over to Exhibit No. 7, Mr. Haseltine. Just what do these figures reflect? I don't quite understand your exhibit here.

A These are the days that we provided a market for the wells indicated in the tabulation.

Q Now, if you say a well was on the line thirty days, whether it produced any gas or not, you considered it on the line, fed to your facility, and the well was exposed to your line?

A If it was on the market it got logged in with thirty producing days.

Q If it was bucking a 400 pound pressure and it had 450-pound well-head pressure of its own, it was producing?

A Well, if the chart was marked, it was producing.

Q If the chart weren't marked, did you consider it producing?

A If it was open to our line.

Q That was a producing day?

A That is right.

Q Without one iota of gas going through the line?

A That is right.

Q I see. Let's take your two exhibits, 6 and 7.

Now does that actually show there was a reduction in production from Conoco's wells?

A Six and seven, yes.

Q Did you take into consideration in your conclusion that

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Continental production went down the number of producing days allocated to Continental?

A Which exhibit are we talking about here?

Q You have your producing days on Exhibit 7, and you have got your production on Exhibit 6.

A Well, no, not for the same time period.

MR. PORTER: I believe Exhibit 6 shows the first two weeks in January, perhaps.

Q (By Mr. Kellahin) Let's go back to Exhibit 5 then. Now, have you computed the number of producing days? You haven't made any comparison of production days against production, have you?

A You are going to have to tell me which exhibit. I have on some. I have not on some.

Q You show me an exhibit you have done that on.

A Let's take Exhibit 6.

Q All right, sir.

A They had 1,957 Mcf per day. That takes into account days, for the chart of January 1, and on January 9, they had 1,954 Mcf's per day.

That takes into account the days.

Q This is an average of the production; isn't that correct, is that what you are talking about?

A That is a per well--pardon me--that is a per day total for Continental's leases.

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Q How do you arrive at a per day total?
A Per day average, pardon me.
Q Per day average.
A Right.
Q And if Continental wells produced 29 days, you would have the average for the 29 days; is that what you are saying?
A We are talking about Exhibit 6, we are talking about seven producing days in one column and eight in the other.
Q You averaged that seven days and the eight days?
A Right.
Q Now, you didn't use this average for all of the wells; isn't that correct?
A For all of the Continental wells, yes.
Q And all of those on Exhibit 6, you show only Continental, you show all of the other wells, too?
A I show all of the other wells.
Q You would have to take your average per well day and divide that by the number of wells, would you not?
A All right. You could do that.
Q Yes, sir.
A I did not do that, but you could.
Q You did not do that?
A No.
Q If you did that, would you agree it would not reflect a reduction in Continental production?

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A On a per well basis?

Q On a per well per day basis, that is right.

A There would be a small increase, but let me point further here, because we testified on exhibit--is it nine?--that has got the pressures on it. No, Exhibit 4, that the line pressure from that first chart period of Exhibit 6 dropped 11 pounds, so what I testificd to on an average day showed a very small, from a 1,957 Mcf per day to total, the 1,957 Mcf total, very small decline.

Q What you are saying if you divided by the number of wells, it would have shown a slight increase in those two chart periods?

A That is right. There was an 11 point drop in pressure to which these wells were producing.

The significant thing is the size of the pressure drop as compared to essentially no change in flow rate from the Continental wells, whereas there should have been an increase.

Q You should have made such a computation for the month of December to compare it to these two 7 and 8 day periods?

A Divided all of the way down to per well day?

Q Yes, sir.

A No.

Q You don't know whether actually on a per well basis there were reductions on the increase, do you?

A Well, I think I do, but I'm not going to say that I do.

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Q You think you do?
A I think I do.
Q You don't want to testify to it?
A No, sir.
Q Now, turning to Exhibit 9, that shows only Continental wells; isn't that correct, that is Continental wells, and that is all; is that correct, Mr. Haseltine?
A Yes, that is correct.
Q Now, the last one on the list, Lease-0, that is only a one well lease, is it not?
A Yes.
Q It shows an increase in production from 47 to 48, from January 1 reading to January 9th reading?
A Yes.
Q Let's go back up to other leases, the J lease, for example. Didn't that show an increase in production?
A Yes.
Q An increase of two Mcf's per day?
A Yes, sir, 26¢ worth of gas.
Q Yes, at your rates. On the L lease, the is 38 Mcf increased to 46 Mcf per day?
A Yes.
Q That is a few cents more?
A That is $1.35 more.
Q Over a period of time, though, that could amount to a

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considerable amount of money?
A Yes, if it had held up.
Q There was an increase on in-weeks?
A Yes.
Q But your testimony is your production declined. That was the purpose of your exhibit, was it not?
A Wait a minute. Did you give me the exhibit on the M Lease?
Q The M?
A The M Lease.
Q The N-Lease, I should have said, shows an increase.
A The N-Lease went up two Mcf's.
Q Yes, sir.
A So, we could show a total increase of 12 Mcf's per day on those three wells on 10-20-31, 12 Mcf's per day.
Q But your testimony is production declined during this period?
A Again, I pointed out that with an 11 pound drop in pressure there was no substantial increase or response of the wells to an 11 pound drop in pressure.
Q Would you expect a substantial increase on an 11 pound drop anywhere else in the Pictured Cliffs Formation?
A There will be some response. If there is going to be any for 111 pounds, there should be some for 11.
Q On a ratio of 11 to 111, is that what you are talking about?
A Well, over a relatively small range, it is a directly

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proportional thing, that is right.

Q Do you know whether or not this is proportionate to the major drop you made in your line pressure; have you checked that?

A Pardon? Is this proportionate to the 11 pound drop? We showed an increase in that proportion as to the 111 pound drop you referred to.

We don't know what increase is going to come out of 111 or 150 pound drop, because, as the exhibits have shown, from the time of October, November, and December on these volumes are generally falling off.

Q Mr. Haseltine, you will admit that your Exhibit 9, while it doesn't show any substantial increase, does note an increase in Continental's production; does it not?

A Yes, and there is another thing we need to point out here. The production is up and down on a given well, not only as a function of line pressure, but a function of how the operator is cleaning that well during that particular chart period.

Q You don't know anything about that either, do you?

A We have a witness who will testify to that.

Q Now, referring to Exhibit No. 10, are these pressures taken at the chart meter point on the Compression Station?

A Yes.

Q Well, now, in January of 1971 your pressures at that point

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exceeded 600 pounds, did they not?

A You mean on those two peaks?

Q Yes, sir.

A Yes.

Q Yes.

A That was what was reported on our pressure information from the field that was plotted here. I don't understand that at all, and I really questioned the accuracy of that, but that is the information that we had to base it on, so we plotted it.

Q Did it--again over in May, it went to 500 pounds?

A It shows 500 on that one day. I don't know what happened. Maybe the compressors were down, or something else.

Q In general you show ranges during August and September from 350 to 400 pounds. That is when your compressor was being repaired; is that correct?

A That is when the construction work was underway, right.

Q But if we come back over into the months of July and June, you were still operating at pressures between 300 and 400 pounds a substantial part of the time?

A Right.

Q Now, what were the pressures in the Ballard line during this same period?

A I don't have the Ballard check meter plotted.

Q You don't?

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A No.
Q What were the pressures in, I believe you call the Lowerie line, going to the north?
A Lowerie.
Q That is Exhibit No. 11?
A Yes. Well, in the early part of the year, they were running about 170, 175.

In mid-year they got up to 250, with peaks up to 400.

I believe those are the same time periods you were talking about earlier.
Q But in general during the months of January, February, March they were in the range of 175--
A Yes.
Q --pounds, as compared to a range of 300 pounds on the east line?
A Right.
Q That is a substantial difference in pressures, is it not?
A Yes, that is a substantial difference in pressure.
Q Mr. Haseltine, I want to talk with you some about Exhibit No. 12.

I am not sure I understand exactly how you constructed this, but it is my understanding of your testimony that you take your market requirements and you allocate them to the producer connected to your system; is this your testimony?
A That is about correct. At the first of the year we

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estimate our market, and then allocate that down on a pool basis.

Then when you get to a pool level with that estimated market, you spread that out on the Commission formula of ASAD's to each well.

Now then as the year progresses and our market, which has been estimated on the monthly basis for the year, proves to be either high or low, we continually correct that so that our market requirements continually correct back to the actual production to the end that at the end of a year our market requirements, with minor exception of adjustments, that haven't come in yet, turns out to be with the field in total produced.

Q That becomes the allocation from this Commission to the pool; isn't that correct?

A From the Commission to the pool?

Q Eventually it becomes the allowable for the pool, does it not?

A Well, the Commission--

Q I mean, assuming you are the only operator in the Pool, I am saying--which you aren't, of course--but let's assume for the moment you are?

A Well, there is the theory of the proration system they use that continually corrects from the nominations or markets system back to actual take, that is correct.

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Q Are you testifying that you make the allocation to individual operators; is this your testimony?

A For the purpose of our dispatching the various wells we have to make some sort of an allocation of our market to the individual wells because, contrary to the assumption we just made, we are not the only taker in the field.

Q Yes, sir. Now, on that basis, do you operate the wells on your allocation, or do you operate your wells on the allocation that has been made by the Oil Conservation Commission?

A We consider both. We know that none of the operators like to have allowables cancelled, and we try to operate in such a way that they don't.

We try to keep the total allocation in a given Pool spread out on what we have taken out of the Pool because it is our obligation to take ratably as to our own needs, not as to some other taker in the Pool, but we do consider and use every month the proration formula and allowable established by the Commission.

Of course, particularly the amount of allowable may be subject to cancellation.

Q Do you have a take or pay provision in your contracts?

A There is a take or pay provision in most of our contracts.

Q There is one in Continental Oil's contract, is there not?

A Yes.

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Q Now, you do recognize the Commission proration system, which is based on 25 percent acreage plus 75 percent acreage times deliverability?

A Yes.

Q On that basis, how do you arrive at the allocation to marginal wells in this Exhibit No. 12?

A We allocate for the purpose of marketing, using the D's that are also on file. If a well has been marginal and normal, there is still a D on file. Now, if it becomes exempt, we use the last D and I's, of course, this accrues to the benefit of the producer who has the exempt marginal well.

Q Did you do that on the Continental wells on Exhibit No. 12?

A Yes.

Q You say that Continental is entitled to, I believe, 13 percent of the market?

A You are talking about which particular year?

Q Well, I don't recall what your testimony was. You said that Continental was entitled to 13 percent of the market and they got more than that. I don't know which year you were testifying on.

A I don't believe I said that they got--they were entitled to 13 percent and got more, because the only year in which their number is 13, they got less.

Q And how did you arrive at that 13?

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A As I have just said, with taking into account the A & I's of all of the wells in the Pool, and are continued, corrected estimate of the market.

Q Now, Mr. Haseltine, didn't you in fact on Continental's wells look at the proration schedule and see what their allowable was?

A I have testified we used the allowable on all of these wells.

Q I am talking about on this computation, did you not use the allowable as reported by the Oil Conservation Commission?

A No.

Q Rather than compute a theoretical allowable fuel on the basis of deliverability?

A No, we spread it ourselves.

Q You spread it on the basis of the Commission formula?

A On the basis of their formula, right.

Q If the Continental wells were unable to produce any gas at all would their fair share of the market be zero; would they still have their fair share on your computation?

A Well, if their wells were unable to produce at all, I would hate to try to serve any part of the market from their wells, wouldn't you?

Q Yes, sir, I would.

A So their fair share of the market would be zero.

Q So, if they are only able to produce as marginal wells, is

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their fair share of the market what they produce or what you compute they should produce? I am trying to find out what you used in this exhibit.

A It comes back to this for a well that will not make either its allowable or its allocated share of our market. It ends up staying on the line all of the time.

Q That is the figure then you have used on Exhibit 12, that is what I want to know, when you say what their share of the market is.

A As to the market requirement percentage.

Q Yes, sir.

A We are not talking about actual production percentage.

Q No, sir.

A We are talking about market requirement percentage.

Q Right.

A What they have computed in the original allocation as to their share.

Q Yes.

A Is based on their AS & AD.

Q You are saying they are entitled to 10.83 in 1969.

A Yes.

Q And they actually produced 13.1 for 75 in 1969?

A Yes.

Q Do you know what proportion of acreage Continental had in this Pool?

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A Proportion of acreage?

Q Yes, sir.

A Not offhand.

Q Would you agree they have 26 percent of acreage?

A In this Pool?

Q Yes.

A No.

Q You wouldn't agree to that?

A No, because this Pool is very, very large, and Southern Union Gas Company only takes gas from a small part of it.

Q Now, on their deliverability, what percentage of the deliverability do they have?

A Of the total Pool?

Q Yes.

A I don't know, very small portion.

Q You didn't compute that either?

A You are talking about Pool gas? I think I have just got a little fraction of it.

Q I am talking about Southern Union's system only.

A I didn't understand it that way.

Q What percentage of acreage do they have that is connected to your system?

A Probably about 26, sounds like a good number, it would be 30-120ths.

Q They have 25. percent of the AD factor in the Pool?

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A I do not know. I would have to tally that up and see.
Q You didn't make that computation in arriving at this 10.83 figure?
A I didn't specifically make that computation myself, but this allocation which is made under my supervision, I am sure somebody in the office did make that calculation.
Q What figure did you use in arriving at 10.83, Mr. Haseltine?
A The A & AD, as applied to their wells, applied against our estimated market. Our estimated market corrected to production entitled them to that 10.83 percent of the market.
Q Did you consider their A & AD's?
A Yes.
Q You did consider, if I am correct, the fact that they had 225. percent of AD's in the Pool, if that figure is correct?
A Yes.
Q You did take it into consideration?
A Yes.
Q You arrived at kind of a figure?
A That is right.
Q Now, what constitutes a marginal well in this Pool?
A One so classified by the Commission.
Q How did it get classified by the Commission?
A It wouldn't make its allowable.
Q Why do wells not make their allowables?

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A Many reasons.

Q Name a few.

A One of them, the one you like, is high line pressure.

Q Yes.

A Wells that are watered out, they are not kept clean. They log off. Wells that are just very poor producers to start with, such that for some reason they got an allowable that they couldn't make, we have got wells like that in every pool in the San Juan Basin connected to everybody's system in the San Juan Basin.

Q You have got wells that water out?

A Some of them water out, but will never make their deliverable high pressure system, low pressure system.

Q You mean the high pressure is a factor; who controls the line pressure?

A The purchaser.

Q The purchaser does. Now, you say that can make a well marginal?

A No, I said "could make a well." Not "make its allowable," yes.

Q If it does not make its allowable, it is a marginal well?

A That is right.

Q So high line pressures can make a well marginal?

A They can make a well be changed in status.

Q Yes, sir.

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A To a marginal well, but, you know, when the next team comes around and a deliverability is calculated, if I am not mistaken, the Commission takes that new deliverability test into account again, and they may choose to reclassify the well.

Certainly the operator under Commission rules has a right to come and ask that a well be reclassified if he thinks it is improperly classified.

This is what we are talking about here, we are asking wells be reclassified.

Q When you have a marginal well, how do you produce it?

A It stays on the line all of the time, essentially all of the time.

Q Regardless of line pressure?

A Yes.

Q If you let your line pressure go up to 500 pounds and we didn't produce anything, by your definition, you would still be taking care of that marginal well?

A If we let our line pressure go up to 500 pounds, I am sure that Continental would come to us and read the contract to us.

Q Yes, sir, and they have not done so?

A We haven't let the pressure go up to 500 pounds.

Q I am talking about have they not talked to you about the contract?

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A No, they have talked about their complaints and wanted relief outside of the contract.

Q Well now, our contract says you can go up to 600 pounds?

A Yes.

Q We can still talk about 500 pounds and be within the contract, can't we?

A We have got to be careful that we don't find ourselves talking about one part of the contract and ignoring something else such as a provision we have got to provide a line pressure that will allow 80 percent of the wells in any given pool to produce.

Q Your operation when you have a marginal well on the line, do you in fact consider that well as being taken care of?

A If it is on the line?

Q Yes.

A It is essentially all of the time, yes.

Q You feel no obligation to reduce your pressure in any area to get the well back on a one marginal status?

A We feel no obligation to run out into the field area where there may be a particularly weak well that won't produce, and at substantial expense do things that are not required under our contract agreement with producers to install a producer to serve that one well.

Q Continental has 31 marginal wells; isn't that correct?

A I think that is right.

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Q All classified marginal. Are those wells in fact marginal?
A If they are so classified, they are.
Q They are marginal, so all you have got to do is leave them on the line regardless of pressure and you have done your duty?
A No, we have to leave them off the line, and compression has to be that in accordance with the agreement between ourselves and Continental.
Q Now, Mr. Haseltine, are you familiar with the Common Purchaser Act, State of New Mexico; have you ever read it?
A Yes, I have read it.
Q It requires you to take ratably from all of the connections to which you are connected, does it not?
A That is right, and I will have to say that anything I say in regard to the Common Purchaser Act, you are asking an engineer to testify in matters of law, and I consistently get guidance on these matters from our legal staff. I will be glad to tell you what I think it says.
Q Let's say what the contract says. You testified on the contract?
A Yes.
Q It says you will take ratably with the other producers to which you are connected?
A That is right.
Q If you consistently maintain high pressures so that the

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Continental wells cannot accumulate underproduction for which you would have to pay, have you taken ratably from Continental, as opposed to other operators who are in a more favorable situation?

A Again, you have got to read the contract in its entirety. The ratability clause does not stand alone nor does the pricing clause stand alone; nor does the pressure clause stand alone. They all have to be read and understood together.

The contract is one instrument, and this is the way we read and understand the thing, and in the light of my understanding, we have taken ratably with Continental.

Q Now, Mr. Haseltine, you heard the testimony yesterday to the effect that when you reduced your line pressures, 12 of Continental wells were able to produce an allowable that would have been assigned to a non-marginal well?

A Yes, I heard that testimony.

Q Do you disagree with that testimony?

A No, on a short-term basis they have produced as was testified.

Q But your line pressures for those wells were prior to that date marginal wells?

A They were prior to that date, they were marginal wells, that is right.

Q Mr. Haseltine, the Commission has adopted its Order No.

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1670 under the terms of which it allocates production of this Pool.

Under the statues it is directed to, allocated on the basis that will enable each operator to recover his fair share of the market.

Now, pursuant to that they have made an allocation to the South Blanco-Pictured Cliffs Pool. If Continental wells are in fact, and at least twelve of them have been shown to be non-marginal wells at reasonable line pressures, then they must be reasonable or you wouldn't have put them in.

Haven't you usurped the Commission's authority in controlling the production from those wells in the past?

A You are going to have to give me that again. I didn't understand that.

Q Can you admit that the Commission allocates on the basis of correlative rights? You understand the term, do you not?

A Yes.

Q You have by your pressures made Continental wells marginal wells in the past?

A No, I haven't testified that we have done that at all.

Q But your line pressures did in fact keep them in marginal status?

A I wouldn't agree to that necessarily at all, either.

Q Well, do you disagree with the conclusion made by Mr. Mattes

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yesterday that the reduction in line pressures enabled 12 of their wells to become non-marginal?

A They are not non-marginal until the Commission classifies them as such. They may not remain non-marginal if they fall off after that short-term compression test.

Q What did the compression test have to do with this?

A Well, if I understood his testimony, the compression test was the type that was used to develop this high rate of flow that resulted in wells possibly being classified non-marginal. That is not correct.

Q That is not correct. Mr. Haseltine, do you not recall a series of six exhibits? We have had three points on them, the mid-point being the production after you reduce your line pressure?

A I remember those.

Q And in twelve instances Mr. Mattes testified that point would be above the allowable in this Pool?

A In twelve instances?

Q Yes.

A He only had six charts.

Q I understand, but his testimony was twelve wells were capable of doing this.

Do you not recall that testimony?

A He kind of lost me in there.

Q Yes, sir.

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A There may be twelve that have flowed at rates that if the rates are sustained would be non-marginal wells.
Q This had nothing to do with the well tests we are talking about?
A If they were not under this compression test, then, no, they would be tied to the fact that we lowered line pressure.
Q By lowering the line pressure you gave us twelve non-marginal wells?
A I keep trying to get this point across. I am not satisfied they are non-marginal after they are on the line three or four months.
Q Three or four months would create some underage?
A That is right, depending on if the Commission reclassifies it, how they keep books.
Q How long does a well have to produce to remain on a non-marginal status; how is it classified?
A If it makes its allowable once, I believe, during the balancing period it is subject to being reclassified.
Q One month?
A I believe that is right.
Q It remains in a non-marginal status until the next balancing period; is that correct?
A Right.
Q There again, if it makes it one month, it remains on a

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non-marginal status through that period?

A That is about right.

Q Now, Mr. Haseltine, let's look at Exhibits 13 and 14. Those are your pressure gradients?

I believe you have made these on a different scale, haven't you?

A Yes.

Q Why did you do that? They are the same, purport to show the same thing, don't they?

A Yes, they do.

Q By putting them to the same scale to make them look as though the pressures were about the same on the two systems, don't you?

A No.

Q No?

A I don't believe anybody looks at the graph without looking at the numbers along the edge.

Q Let's look at the numbers along the edge. You show on Exhibit 13 that you start with a pressure of 200 pounds. Actually, that should have been 215, shouldn't it?

A On that particular day the pressure that was reported in to us was 200.

I would be glad to change it to 215. This makes this thing a little more favorable to me.

Q You show a very high pressure gradient to distance of--are

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these miles?

A Yes.

Q Six miles, six and a quarter miles, roughly. The pressure gradient moves up pretty rapidly, does it not?

A That is right.

Q Is that the two 12-inch lines you have?

A That segment in there between mile post zero and mile post section .5, or whatever it is, includes the two parallel-- twelve goes a little bit beyond the, presently goes a little bit beyond the point of tie-in of the new--

Q How do you account for the high pressure gradient on that segment of the line as compared with the remainder of the line, which is a smaller line, is it not?

A Yes. If you refer back to Exhibit 1, you will find that six and a quarter miles puts you back out to about the middle of the Continental J-lease.

Now, beyond that point you have got several branches that begin to come into that system.

You have got one from Township 26-5 to the north, and you have got a complex from 26-4 that feeds into the system that turns south into 25-4, and that system in 25-4 is one that is plotted here on this graph, so what you actually have in this segment there, that last six miles leading into the Dogie Canyon Station, you have got a merging of a member of the gathering branches, and so the

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gradient the last few miles of line is higher.

Q Do you mean those marginal wells, Continental wells in the J-lease are accounting for a good portion of that; is that what you are saying?

A No. Those Pan-Am wells in there are accounting for a good portion that have--

Q The Pan-Am wells are where?

A In the northwest quarter of 25-5.

Q And they are another five or six miles up the line, aren't they?

A No, they are right in there in the segment we are talking about.

Q In the northwest quarter of 25-5?

A Yes. Continental also has some pretty good [illegible]

Q They are going in the same line?

A Well, yes.

Q Do you have any connections between the Continental J lease and your Compressor Station to any other source of supply?

A No. I will have to answer that question, again.

Q Do you have any connections to any other source of supply in that segment between the Continental J lease and the Compressor Station?

A Not between the Continental J lease, but in the same area with the J lease.

Q And to other operators as well as Continental?

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A Yes.
Q That would also help cut that pressure gradient?
A Yes, all of the gas that goes into that system has its effect on the gradient.
Q Now, did you make a similar study of the pressures on the Ballard line?
A No.
Q You did not? Did you make, did you make a similar study of the pressures on the Lowerie line?
A Yes.
Q It did not have the same pressure gradient?
A No, it does not.
Q I believe you testified yesterday that the per mile gradient was about four pounds on the east line of the Jicarilla system?
A Yes, on my data, if we change that left number there to 215 instead of 200, it would be about three pounds.
Q You testified, I believe, that anything less, the gas wouldn't flow?
A You can get it down to zero and the gas won't flow.
Q But you have to have some differential?
A You have to have some differential.
Q You have about two and a half pounds on the Lowerie line?
A Yes.
Q You could operate this line or two and a half pounds, too,

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could you not?
A Given proper expenditures of money, you could operate it on two and a half, maybe two.
Q Now, wouldn't this indicate that you should lower the discharge pressure at the Dogie Canyon Station where it enters your compressor?
A Lower it?
Q Yes, sir, to get a lower pressure gradient here.
A Lower the discharge pressure?
Q Well, the intake pressure at your compressor.
A Suction pressure?
Q Your suction pressure, on the first stage there?
A Yes, that wouldn't change the gradient.
Q It would not change the gradient?
A No.
Q It has the same gradient all of the way through?
A If the wells respond with more gas, you would have a steeper grade.
Q Now, does this, these two exhibits, indicate you are furnishing the same facilities to all of your producers connected to your system?
A We haven't testified that we are furnishing the same facilities to all producers.
Q You are not?
A No.

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Q Now, the Largo line pressure line does not in any way connect with this East system, does it?

A Not until the East system has been discharged.

Q Into the compressor?

A At Dogie, right.

Q Now, you introduced, over objection, I might add, the contract yesterday which was with Humble Oil & Refining Company. That is the contract under which you are taking Continental Oil Company's gas, is it not?

A That is correct.

Q You have a provision in this contract governing the price which has a sliding scale on it related to line pressure furnished?

A Yes.

Q Do you have a similar provision in your other contracts?

A In all of this in the Jicarilla system.

Q All of them in the Jicarilla system?

A I am making one exception there. The Aztec contract predated that, but their contract is tied to the prices paid to the other producers there to see they get the effect of it.

Q O.K. Now, your exhibit shows that you are paying Exhibit 16--I am referring to at the moment that you are paying Aztec 13.3¢ in December of 1971, with the exception of one well, you are paying 13.8?

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A Yes.
Q Actually, that is probably 13.25; is it not?
A It is 13.25 plus some tax reimbursement.
Q Now, you are paying Continental Oil Company 13.3¢ in December with the exception of a couple that you are paying 13.8?
A There are about four that we are paying 13.8 on.
Q So you are paying Aztec and Continental substantially the same price?
A Yes.
Q You are paying Caulkins Production Company thirteen cents?
A Yes.
Q What is their reimbursement; what are you charging them for compression facilities?
A Nothing.
Q Nothing. You are furnishing that to them for free?
A Well, not for free.

It is reflected right there in the price.

Q So you are saying then that the difference between 13¢ and 13.25 justifies you in treating Continental's wells as you have treated them?
A Well, apparently both parties to the contract thought so when it was written. They all signed it.
Q I am talking about today.
A Nothing confusing about it. I think that it is still

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justified.

Q You think it is justified?

A Certainly.

Q Actually, you are paying now on most of those wells 13.25 and not 13.3?

A 13.25 plus tax reimbursements, which gets you up toward 13.3. I am not sure what the decimal is.

Q Your contract says 15¢ less the compression charge. Now, the tax reimbursement is something else again.

A The contract does speak to tax reimbursement.

Q You are paying tax reimbursement on all of your connections are you not?

A No.

Q You are not?

A No.

Q You are not making a reimbursement to the Caulkins?

A To Caulkins?

Q That is the only one?

A No, it is not the only one.

Q What others are you not paying tax reimbursements to on your Exhibit No. 16?

A I don't believe that McDonald is getting it on their four wells.

If they are getting it at all, it is so small it doesn't reflect when rounded off to a tenth, and the

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Navajo Indian well of Production Company--I don't think they are getting the reimbursement because their reimbursement on a 13¢ price run is just a little over hali a tenth, so it would always round up to 13.1, and I am just not real positive about whether we are paying tax reimbursements to McDonald Production Company on those Navajo wells or not.

Now, your question, of course, as asked is whether or not we were paying prices without tax reimbursement to the other operators.

We are paying prices without tax reimbursement to many operators, but I can only speak as to the South Blanco-Pictured Cliffs Pool as precisely as to Caulkins' system, I am just not real sure about the McDonald or the Supp Navajo wells.

Q Is this the price you are paying in the San Juan Basin for Continental wells?

A For what kind of gas?

Q For gas?

A No.

Q No?

A No.

Q Are you purchasing--is it your testimony you are purchasing from wells in the San Juan and Rio Arriba County at

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higher prices?

A Yes.

Q Now, under the terms of your contract at page 10, you have a provision on minimum purchases. I think you said you have to take 80 percent of the well's capability; is that correct?

A No, that is not correct. That is not correct. What is correct, in our opinion, is the take provision.

Q Yes, sir. Turn to page 10, and I would ask you to read the first portion of sub-paragraph A under Section 1 or Section 2 of the Minimum Purchaser Provisions.

A Sub-paragraph A of Section 2?

Q Yes, sir.

A That is not the take or pay clause, you realize.

Q No, sir.

Article 12, Section 2, sub-paragraph 8. We will start there with Section 2.

"Buyer agrees that he will take gas from each well now or hereafter located on the subject lands and connect it to gathering lines at least ratably with its taking from all other wells producing from the same horizon on the subject lands or in the gas field in which said well is located, as such well may hereafter from time to time be enlarged and extended, which may from time to time be connected to buyer's gathering lines, it being understood and agreed,

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however, that in complying with this ratable purchase undertaking may by prorating its withdrawals between wells on any basis which gives reasonable effect to the factors, among others of open flow capacity, bottomhole pressure, and the size and shape of the drilling unit, so long as the method of proration employed is uniformly applied by buyer with respect to all of the wells on the subject lands and all wells in the gas field in which seller's wells are located from which buyer is purchasing and/or producing gas from time to time, adjustments to effect such ratable purchases are to be made between wells at intervals of not longer than six months."

Q Does that section give any weight to the price you are paying for gas?

A Where?

Q Continental Oil Company.

A Yes. That section gives consideration to the price you are paying to take ratably with all other producers.

Q Where does it say that?

A Oh, all right. Let me back up a minute. What was your question again?

Q My question was, you have said that differences in facilities you are affording is related to price.

Where in this contract does it say you can take that into consideration when you agree to take ratably from

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Continental Oil Company?

A Well, the whole contract reads together, including our right to operate our Gathering System at pressures up to 600 pounds.

Q I am talking about ratable take provision, Mr. Haseltine?

A I understand that you are, but you can't separate that out and make it stand on its own.

Q In other words, you cannot contract to take ratably without modifying it?

A As long as the ratable take provision is there in a contract, that includes provisions, other provisions that have all got to be read together.

Q What provision would you like to read with this?

A We would have to start with where it says "Natural Gas Purchase Contract," and end where it says "signed," by some vice president.

Q You haven't put your finger on anything that modifies this section; can you do so?

A I don't mean to be flippant, but the entire contract itself, pressure, pricing, provisions, all reads together, including we have a provision as to disconnection, this sort of thing. This has to be read together.

Q Can you point to anything in the contract specifically which modifies your agreement to take ratably from Continental oil wells?

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A Let me just point this out: that the contract itself has to do with the provision we have just read, speaking in terms of taking ratably, and it says we can give reasonble effect to many factors, among others--

Q Does it say price?

A Well, "other factors" includes price, does it not?

Q Does it say price?

A Not specifically.

Q Now, this sub-section B provides that if you do not take gas from the seller's wells and drainage occurs, you will disconnect or release from the contract acreage; isn't that correct?

A Well, the sub-section B does pertain to that, that is right.

Q Has such a demand been made on you?

A Yes.

Q Now, the contract does provide that if we have under production, allowable under production, which you fail to take, you will pay for it, does it not?

A Yes, Mr. Kellahin. I would like to answer that question a little while that you were talking about, anything modifying that ratability take.

That sentence didn't end where I stopped reading, merely the sub-section ended.

Q Yes, sir.

A If you go on down that sentence doesn't end two-thirds down

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the page. It says, "Price---" however, there are some phrases in there that modify that ratability taking.

Q Did any of them mention price?

A No, they mention compliance with the New Mexico Oil Conservation Commission jurisdiction.

Q This is exactly what we want you to do, Mr. Haseltine.

A Be glad to.

Q You have to either take or pay the allowable assigned to these wells.

A The take or pay clause--

Q Yes?

A --says that we will take or pay for the extent, not in fact taken, but six times the average amount of gas taken monthly from said wells. It is on a per well basis during the month of December, calendar year preceding January and February of the current year. It does not say that we have to pay for cancelled allowance.

Q You have to take six times the December production?

A Six times the average of December, January, February.

Q Now, there is a force in reserve clause which is common to the contract which makes them subject to all of the lawful statutes and rules and regulations of the Governmental Force?

A There is a clause, but there is probably a clause more specific than that that says this agreement is subject to

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the land laws of the land.

Q Well, it would have to be in any event, would it not?

A I would think so.

Q Now, on Exhibit 17 I believe you showed some contract provisions, did you not, those are the contracts under which you operated this Pool?

A Those are the base contracts, yes, sir.

Q And all of them are an indefinite term, with the exception of the McDonald Oil Company, I think you show hereon, and Centinental's oil?

A That is right.

Q Had you considered the possibility of renewing Continental Oil Company's contract at its expiration date?

A Well, we have had it pointed out to us that, by Continental, that gas may well be withdrawn from us at the end of this summer, and, of course, we considered it, because this is my own personal obligation to the company.

Q So you did consider the factor that Continental may not renew their contract with you?

A Oh, they have pointed that out.

Q You testified at some length yesterday, I believe, that the compressor installation would be extensive; that is correct, isn't it?

A Yes.

Q Had you considered any other alternative than installing

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additional compressor equipment?

A For what purpose?

Q To reduce the line pressures on the East segment?

A Well, the normal way of reducing line pressure in any area are either with pipeline or compressors, and the engineers do, who do the specific design consider both, and usually, as is in the case in construction work we have been talking about in this case, they use both, they use compressors, hp, and they use pipeline to lower pressure in the area.

Q I believe you testified you couldn't afford for the remaining term of Continental Oil Company's contract to install any additional equipment to lower this line pressures?

A Not to specifically alleviate a problem that deals with gas that is going to disappear in three or four years.

Q Such equipment would not be confined to Continental Oil Company, though, would it?

A No.

Q It wouldn't be for their sole benefit?

A It would if we went in now and did some additional work.

Q You don't feel that you are penalizing even your own Jicarilla wells?

A We haven't had any complaint raised, anyone except Continental.

Q Yes, sir.

A Aztec is checkerboarded with them.

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Q You have interlocking directors of Aztec, do you not, speaking of Aztec?

A Yes, we do.

Q You control Southern Union Production Company, do you not?

A The management of Southern Union gas is under Southern Union Production Company.

Q You aren't apt to have a complaint from yourself?

A I wouldn't know why not. Those people have not ever held back from fussing yet.

Q If you did install additional compressor facilities, over what period of time would you depreciate that?

A Those things are normally installed and set up on depreciation of about, I think, 10 to 12 or 15 years. I am just not real positive as to that number. We are talking about the gathering system?

Q Yes, the gathering system.

A Right.

Q This compressor equipment can be moved from place to place as needed, can it not?

A Well, at major expense, you are talking about not skid mounted units. You are talking about permanent installations, one with a lot of permanent piping and valving that goes into these things.

Q Do you anticipate you will continue to operate in the South Blanco-Pictured Cliffs Pool?

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A Yes, as long as gases are producible therefrom.

Q Your company today is making connections to other sources of supply in the same area?

A Yes.

Q Compressor facilities would be available for those connections as well, would they not?

A If they were installed now, and they became--a time arrives when they were needed for something else, they could be put back into service to use for the sources you are talking about.

Q Tell me, does Southern Union need this little bit of gas that Continental is producing?

A Any kind of a need for gas is whether it is used or any other company has a dollar value on it, as I think everyone can well appreciate.

Given a limit on the cost of gas to our line, yes, we can use additional gas into that system coming out of that area, but everything has got a dollar top on it.

Q You are not meeting your present requirements, are you?

A Where?

Q Well, for example, Kerr-McGee, or at the Public Service Company of New Mexico?

A Kerr-McGee is certified to buy the gas we purchase from El Paso Natural Gas Company.

Public Service, yes, we are meeting our contract

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requirements with them.

Q You made a trade with El Paso for natural gas, didn't you?

A We have some trades, but not for the purpose of serving Kerr-McGee.

Q Now, you recently made a contract to sell gas to El Paso in the area involved in this Application, did you not?

A Yes, we made a contract to sell them some gas out of this area. That account is subject to Federal Power Commission approval, and right at this moment, that looks like it is not going to come.

Q What kind of pricing did you apply for?

A For a half cent above our cost of the gas.

Q Nineteen and a half cents?

A Given a 15¢ cost, it was four and a half, about, above the cost. That is what the price was.

Q I believe yesterday you testified that Continental Oil Company shouldn't be permitted to take a portable compressor out to the field and thereby increase their D-factor, or deliverability for the purpose of allowable; did you not testify to that?

A I don't recall exactly how my testimony went, but it was to the effect that no one should be allowed just to run around the field with a portable compressor and get a high test run off down the road with that compressor.

If they are willing to increase and sustain a

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deliverability out of that well, that is fine and wonderful. I would be glad for Continental to do that on all of their connections.

Q Can you point to any single bit of testimony or any exhibit we offered here which indicated we increased our D's by these tests?

A That you increased your D's?

Q Yes.

A By the test?

Q Yes, sir.

A I think that the other witness testified to that.

Q Didn't you testify that some went up and some went down?

A Well, I thought the thrust of his testimony was that generally they went up.

Q Mr. Haseltine, just to refresh your recollection, wasn't he talking about the cost or production, the flow rate from these wells?

A He was talking about that, but I think he is talking about the D's, also.

Q But, you are not positive, are you?

A Well, I am not positive as to his testimony, but as a matter of fact, I think that the D's did go up as a result of those tests, did they not?

Q As a matter of fact, Mr. Haseltine, they did not, and we will be happy to put another witness back on to testify to

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that.

A Fine.

Q I believe you will recall, will you not, that the test data the witness testified that the test data was not filed with the Oil Conservation Commission until this hearing?

A Yes, I remember that.

Q So, it couldn't be used for allowable purposes?

A So far.

Q So far?

A Right.

Q Mr. Haseltine, I would like, if I may, to return to the exhibits on the gradients on the two lines which are Exhibit 13 and 14 for a moment.

A All right.

Q Now, on Exhibit 13, the Jicarilla line, would you estimate the gradient on the first six miles of that line?

A Oh, it looks like it would be fifty pounds in about seven miles. That is seven pounds per mile, maybe seven and a half.

Q Now, are you using the starting point of 215?

A No, I am using 200, which is my data.

Q Can you estimate the gradient on the first six miles of the Lowerie line going to the north?

A It would be about---oh, it is probably between one and two pounds per mile on that plotted one.

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Q The pressure gradient on the Jicarilla line, the first six miles, is really closer to ten than it is seven; isn't it, or maybe I can't read your graph?

A No, I was using seven miles there, it is six and a half plus, and at seven miles you are at about the 250 pound level, so you have got a Delta-T of 50 pounds in seven miles. I said seven or seven and a half, give you half a pound on it.

Q You say seven and a half as against one and a half on the other?

A Yes.

Q That makes the hydraulic gradient on the first six miles of the Jicarilla line how much?

A Whatever seven and a half is, about five.

Q The Lowerie and the Jicarilla, isn't this the same Jicarilla line you said you just finished looping with another well line?

A That is right.

Q What size loop would you have had to install to give the same pressure gradient as the Lowerie line?

A I don't have a Panhandle Flow Line Formula with me.

Q You don't?

A No.

Q You don't know it offhand?

It would have to be substantially larger than what you

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installed, would it not?

A I would imagine so, yes.

MR. KELLAHIN: I believe that is all I have. Thank you.

MR. PORTER: I think you had the witness longer than Mr. Jameson. Maybe we can call him your witness.

MR. JAMESON: I have one or two re-direct questions, Mr. Porter.

RE-DIRECT EXAMINATION

BY MR. JAMESON

Q Mr. Haseltine, Mr. Kellahin referred to the system of designing the pressure differential in his questions on cross-examination.

I will just ask you if this was, if any considerations are given to the contractual pressure requirement in initial design of gathering systems?

A The two factors that go into initial design of gathering facilities are contract pressures and expected volumes available. These are the two perameters used. Contract pressure is just absolutely essential. That is what you design on to start with.

Q When you design on contract pressure you presumably designed on a pressure basis that was acceptable to the seller or you wouldn't have signed the contract?

A That is right. After the contract is signed, everybody

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goes forth having made a satisfactory agreement.

Q Reference was made on Exhibit 10 to some kickers in the graph showing abnormally high pressures for a day or two on the line represented by that graph.

I will just ask you this question:

Is it possible for wells that are making hydrates to cause pressures in the line that will cause a pressure build-up for short periods of time, until a freeze is remedied?

A That is right. Now, of course, this pressure is taken down there at the check meter point, so hydrates would have to be between there and the station.

I don't really know what this was.

It may have been improperly imported or it may have been the compressor, or down-time, or something. In answer to your question, yes, hydrates will form in a line where three factors are present: natural gas, water, and turbulence, and given the right conditions of pressure and temperature hydrates will form and plug a line, cause high pressures at a well, and cause a well to lose production.

Q Now, Mr. Kellahin asked you a question as to whether line pressures other than those paid to Continental were paid by Southern Union for other gas in the San Juan Basin.

Could you briefly outline the differences on which those price differentials are found?

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A They are precisely the same as reflected in the Continental contract, a right to gather gas at pressures up to 600 pounds.

In most of our high pressure, high price contracts in the Basin we do not have the provision for lowering pressures and lowering price simultaneously.

That feature is characteristic only of this whole Jicarilla area, and, of course, all of the contracts in that Jicarilla area carry that same pressure price reduction pattern, and the contemplation originally, and as it has been since implemented, was that the system would operate at high pressures to begin with, with a gradual lowering as contemplated by the contract.

Q Now, the higher prices paid generally are applicable to the Mesaverde and the Dakota formation in recognition of the higher pressures of those formations?

A That is right.

MR. JAMESON: I believe that is all.

MR. PORTER: Anyone else have a question or two?

MR. UTZ: I would like to clear up one column of figures, possibly two columns of figures on Exhibit 12.

CROSS-EXAMINATION

BY MR. UTZ

Q The first column is an Mcf and the second column is, of course, in percentage in regards to your market requirements.

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Now, my question is, in the first column do those figures represent the Oil Conservation Commission--in the first column, do those figures represent the Oil Conservation Commission allowable?

A No, not entirely and not exclusively.

They reflect our consideration of the allowables, but that number is the ultimate division of our market.

Q In other words, they reflect a portion of your purchases or your market demands on your system and do not reflect the allowable figures for the whole Pool?

A Well, they do reflect that to the extent that I have tried to explain, the allowable for the whole Pool, because the allowable for the whole Pool, as we both know, is divided down into individual wells, the allowable that falls on the given well is reflective of our market plus the market of another purchaser.

Now, then at that point a well accrues underage or accrues allowable subject to cancellation, or it becomes over produced, depending on the allowable assigned to that well by the Commission.

Now, that then bears on our allocation of gas to that well, too, but the ultimate allocation after that is on our market, because that is really all we have to allocate.

Q In other words, on a per AD unit or for a well it is pretty hard to guess what a unit is in our proration formula up

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there, but let's say that a well with a hundred deliverability, an acreage factor of one, these figures would be lower because your overall market demand is lower than the Pool allowable?

A I don't know whether our overall market demands in the South Blanco currently or in recent time has run under our allocated share of the market, either. If what you are saying is right, if it is not, what you are saying would be the opposite.

Q Would you use these figures in column 1 to determine this?

A Yes, that is right. I just have to check back. I don't know whether that has been the case or not.

Q You don't know whether they represent our allowable assigned by us or whether they represent your market demands?

A They ultimately represent our market demands, since that is all we have got to allocate.

Q Now, a question came up in my mind when I looked at Exhibit 2, your plat of compression. Do you know whether or not, of course, I am sure you know why I am asking this question --you have an inlet pressure of 165 pounds on your reciprocal compressor. On your two Solars you have intake pressure of 215 pounds. Do you know whether or not the system that goes into the Solar compressors on the basis of allowable is ratable with allowable taken on your reciprocating

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compressor on the Ballard and Lowerie systems?

A Yes, I believe that it is ratable with the allowable assigned by the Commission.

Q In other words, you think the 215 pounds is giving you ratable takes in accordance with the allowable the Commission assigned as your 165 pound pressure?

A Yes. This goes back to the question you asked a minute ago. I didn't--I think I mentioned this--but I may not have made it clear. When we take our total market and divide it down to a Pool

Q Yes?

A We are dividing our market to a Pool, and we consider many things, what kind of an allowable that pool will get from the Commission. So our original market allocation to a pool tried to take into account about what our allowable is going to be. If we didn't do that, we might end up allocating a piece of our market to a pool where we are not going to get allowable to cover it.

On the other hand, the allocating to a given pool, and end up with a lot of cancellations to the original and to allocation, includes our consideration of what we think that allowable is going to be, of course, this is an in-house thing. We can shift our market from pool to pool with some flexibility, not a great deal, but some. As the year progresses, if the allowables are all accumulating

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here and not accumulating, that sort of thing.

Q Your policy is you try to take the Commission allowable?

A That is right. We try to accommodate those, and in years gone by we had substantial cancellations. We try to get a cancellation ratable, too. That has not been the case in recent time.

Q So, in order to take ratably, if this involved putting in some more compressors, it would be your policy to do this in order to take the Commission allowable?

A No, Mr. Utz, we have not heretofore installed facilities on the basis of what allowables might be needed to be in the future.

We have installed facilities based on what the gas is going to be in total out of a given area, and what kind of pressure we can get it at, or we have to do to get it. This is what determines our installation facilities.

Q Well, perhaps you misunderstood my question. Specifically, let's look at the well, let's look at the Ballard and the Lowerie system over here. If you were not on that system, if you were not taking Commission allowables or you were taking much less of the Commission allowables, would it be your policy to increase your compression there so that you could take the higher percentage of the Commission allowable?

A Not just for that purpose. It would have to dovetail with all other factors that go into it.

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Q Your contracts?

A Our contracts, our market, the whole thing.

Q I think that answers my questions.

MR. PORTER: Any other questions?

MR. STAMETS: Yes.

CROSS-EXAMINATION

BY MR. STAMETS

Q Mr. Haseltine, assuming that you were assured of Continental gas for as long as you would like, do you think Southern Union would have any objection to installing the additional facilities on the Jicarilla line to reduce the inlet pressure at the Dogie Station?

A This is a tough one to answer because when you assume that Continental is willing to extend a contract, that is a big assumption. It is not just for Continental, either, but we are all familiar with this total price picture in the San Juan is squirming around, and no one knows today what that price picture is going to be five years from now, and neither Continental nor any other prudent operator, if they can avoid it, is going to lock themselves to a long-term price here in the spring of 1972 when they can get this picture out for two or three years, hope they see which way that price thing is going to go. It is not just Continental in that respect. It is all producers, so to ask me to assume that Continental would extend that contract, that is

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a real tough assumption to make, because that assumes you have agreed as to the price provision and many other things.

I just can't conceive that they would be willing simply to extend this Commission contract life of the lease because they are in the same position most operators are. They think that there is going to be a substantial price change in that area. They are probably right.

Q That wasn't exactly the answer I was hoping for. What percent of the Jicarilla line through-put comes from Continental wells?

A Well, they are shown here on Exhibit 2.

Q I am not just speaking about the South Blanco-Pictured Cliffs. I am talking about the total Jicarilla line.

A That Jicarilla line carries about 48 million per day, and Continental wells put out about a million and a half a day, I believe is the number, say three percent of the through-put.

Q Are there other leases connected to this Jicarilla line which could ultimately justify expense of installing all these additional facilities that have been discussed?

A Well, that is a guess. Either one of two things is going to happen, either volume available out of that area will decline, which will result in a decline in the Gathering System pressures to the end that no further hp is needed; or in order for us to get the reserves out we would have to

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put in a horn, one of the other.

We don't know which today. No one can guess today which is going to occur, but the field has got a real long, protracted life such that if the volumes are going to dwindle down to a very minor amount we may have more hp than we will need five years down the road.

In other words, it may be that the wells will prove to be responsive enough, and with substantial reserves to the extent that it will behoove us to put in additional compression to get the gas at a higher rate.

In either event, regardless of if we knew which way to guess today, you are talking about installing of facilities that wouldn't be needed for some years down the road.

MR. STAMETS: That is all.

MR. PORTER: Any further questions?

The witness may be excused. We will take a ten minute recess.

(After recess.)

MR. PORTER: The hearing will come to order, please.

MR. JAMESON: The next witness will be Mr. Alvin Dean.

MR. PORTER: Come up and take the witness stand. I believe the record will show he has already been sworn.

ALVIN DEAN

a witness, having been first duly sworn according to law, upon his oath, testified as follows:

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DIRECT EXAMINATION

BY MR. JAMESON

Q State your name for the record, please.

A Alvin Dean.

Q And are you employed by Southern Union Gas Company?

A Yes, sir.

Q And in what capacity?

A Field Superintendent.

Q In what area?

A In the Jicarilla area.

Q How long have you been employed in that position?

A In the superintendent's capacity five years; prior to that field foreman for three years.

Q Could you describe generally what your responsibilities and duties and work is with Southern Union in the capacity of Field Superintendent?

A Generally it is supervising installation, operation and the maintenance of gas gathering facilities in the Jicarilla area.

Q When you speak of the Jicarilla area, does that area include the South Blanco-Pictured Cliffs Pool?

A Yes, part of it.

Q When you say "part of it," now what part are you referring to?

A The portion of the line that we have been describing as

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going west over to it. On the Ballard system I have no control on it.

Q Have you had the occasion to become familiar with the Continental wells connected to the Gathering System under your supervision?

A Yes, sir.

Q I will ask you this question: Has liquid in the Continental wells affected delivery of gas from those wells into the Southern Union Gathering System?

A Yes.

Q In what way?

A The liquid accumulating in the well bore itself, if it is not relieved, will definitely hinder the flow of gas, and it can naturally cause measurement problems and line freezes or hydrates, if you will.

Q Can that liquid actually accumulate to the extent, and has it done it in the past to the extent that the entire flow of gas from the well into the Gathering System is cut off?

A I wouldn't necessarily say cut completely off as a result of liquid in the well itself, but the flow has definitely been hindered, I will put it this way.

Q Does that liquid in the well often cause a freezing up of the well?

A Yes.

Q When a well freezes, does it deliver into the line?

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A No.

Q Has liquid in the Continental wells caused any freezing up of the lateral line of Southern Union connecting the wells?

A Yes, sir.

Q There has been some flow of liquid from the Continental well that ties into the Southern Union gathering line connected to the well?

A That is right.

Q And when that happens, what happens to the flow of gas from the well?

A It can block off an individual well line or gathering line and possibly enter the Gathering System.

Q Now, what action do you and the people under your supervision take when those line freezes occur?

A Depending on the circumstances of it, generally it is easier just to shut a well in or all of the wells on the Gathering System, and relieve the pressure, allow it to be atmospheric pressure. Your hydrates will come unfrozen if it is a hydrate freeze.

If it is an actual water freeze, this is about the only way you can do it, leave it down until the freeze comes out, or you can inject methanol to help alleviate the problem.

Q Would you say that these lines freeze because of the hydrates produced from the Continental wells occur

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frequently or seldom, or with what frequency?

A Oh, I suppose you could classify it frequently, yes, sir.

Q Now, what has Continental done with reference to alleviating the liquid problem in their wells?

A They have installed on a number of wells over the past years intermitters to automatically relieve the well bore of the accumulated liquids, and on two or three occasions they have went in and reworked the well. I think possibly they installed a smaller tuck, but I am not certain.

Q Now, how many of their wells, to your knowledge, have intermitters installed on them?

A Approximately 17 or 18 of the South Blanco-Pictured Cliffs take off.

Q Right off the south?

A Possibly 17 or 18.

Q Out of 31 Continental wells?

A Right.

Q How do those intermitters work?

A They are generally a pneumatic-actuated valve controlled by a time cycling device.

Q Are they actuated by a clock?

A Yes, sir.

Q How many days are those clocks usually wound for?

A Eight days generally.

Q The people under your supervision found those clocks to

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have been run out, not been rewound by Continental at times?

A Yes.

Q Would you say that occurred frequently?

A Quite frequently.

Q Have you experienced or observed any delays between the time that a Continental well is logged off on account of water and the time that Continental's personnel have blown the well down to try to alleviate that situation?

A Yes, sir, I have.

Q Let me ask you this: Have the people under your supervision when they find those intermitters wound down volunteered some assistance to Continental and rewound them for them?

A Yes, sir, they do when they have time or if a well does not have any intermitters on it, they will on occasion clean the wells themselves to prevent us from having measurement and line problems.

Q Even though we consider that those activies are duties of the operator regarding the operation of his wells?

A Yes, sir.

MR. PORTER: Isn't that in violation of union regulations?

THE WITNESS: It is also in violation of company policy.

Q (By Mr. Jameson) In your conversation with Continental personnel operating these leases, have you obtained any

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information as to how many people they have got employed in this area to operate their wells?

A So far as I know, they have three field personnel in the area.

Q How many people, how many wells are those three people trying to operate?

A I really don't know.

Q But they do have other wells other than those connected to the Southern Union system?

A Yes, sir, they do.

Q The question that arose yesterday in the testimony as to the piping arrangement that Continental employed on their portable compressor when they were running compressor tests, can you describe that for us?

A On two of the wells for sure, the Continental Jicarilla or the Axi Apache J-1, and J-2, and also, I am sure, on the Continental M-1, they did have a suction line coming out of the tuck and a discharge line coming from the discharge side of the compressor back into the casing, with a pressure controlling device installed on the tuck, and the motor valve on this discharge line where the suction on the tuck failed, it would be open, it would open this motor valve and allow a discharge of gas into circulate into the casing of the well.

Q With what effect on the arrangement, as far as keeping the

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well clear of liquids during the freeze period?

A It could quite easily circulate enough gas to lift accumulated liquids of the well, and thereby keep it clean.

Q In other words, they would get the best production rate through that arrangement, unaffected by liquids, than they would get if they didn't pipe that gas back into the well casing?

A Yes, if they had enough circulation.

MR. JAMESON: I believe that concludes our direct testimony.

MR. PORTER: Mr. Kellahin, you have some questions?

MR. KELLAHIN: Yes, if I may.

CROSS-EXAMINATION

BY MR. KELLAHIN

Q Now, Mr. Dean, you referred to an instance where Continental lines froze up. When did this occur?

A It occurs at any time when the liquid comes out of the wells, or any of the Pictured Cliffs wells, with the exception of one or two. They have no dehydration facilities on these wells, just separation, which separates free liquid, and then is accumulated in our gathering line--naturally it will freeze up.

Q You testified that it did occur; when did it occur?

A It occurred quite often.

Q What do you mean by often?

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A We remove or the Continental wells probably a freeze or two a day.

Q All through the year?

A No, sir. In the winter time.

Q What time of the year?

A Generally the freezing starts in October and will extend through say March or April.

Q When and where did you remove a freeze on a Continental well?

A I haven't personally removed a freeze from a Continental well.

Q Have you personally seen a freeze?

A Not for a number of years, but I have personally seen freezes--

Q Where?

A --removed from all of our Continental Axi Apache L leases, L, N, 0, J.

Q The 0 Lease was frozen in?

A No.

Q What well was frozen in and when, do you know?

A Yes, sir, on the 'K lease, in particular last year we had a number of gathering problems. It could have been contributed to the Continental well or Southern Union's, either one, or Aztec's.

Q You don't know whose they were?

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A No, sir.

Q So you can't name a single instance where you had a freeze on a well at a given time?

A If I had the charts available, I could show you a number of wellhead freezes and freezes between the wellhead and the meter and immediately

Q You testified Continental had intermitters, I believe, on 16 or 17 wells?

A Perhaps that many.

Q Generally the Pictured Cliffs Formation is productive of water in this area, is it not?

A Correct, yes, it is.

Q Do all of the other operators also use intermitters?

A All of the other operators, most of them.

Q Not all of them?

A A few do, yes.

Q How would you compare the water problem of Continental's oil leases with the water problem say on the Caulkins leases; don't they have a water problem, too?

A Yes, they do.

Q Do they use intermitters?

A No.

Q They don't?

A No.

Q The size of the water problem is important as to the flow

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rate of the gas, is it not?

A If you flow your wells at a higher rate, you are less likely to have frequent water accumulation than if you flood at a higher rate. The water well releases itself of the water and we catch it in our facilities.then.

Q So if you have a lower line pressure which permits the well to produce at a higher rate, the water problem would be less frequent, wouldn't it?

A No. At a lower line pressure a well doesn't necessarily plug at a higher rate.

Q You say it doesn't?

A At a lower line pressure the well loses its ability generally, if it isn't producing at a higher rate, to lift this water out, and thereby it has to be physically removed.

Q Is it your testimony that the Caulkins Oil Company is not producing at a higher rate than Continental?

A I couldn't say on an individual well basis.

Q Is it your testimony that Continental is not producing at a higher rate under the present line pressures than it was producing under the prior line pressure of three to four months ago? This will be testified to.

A I don't have the figures here before me, sir.

Q You don't know, but you wouldn't dispute that, would you?

A No, I wouldn't.

Q But you do persist that lowering the line pressure doesn't

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necessarily increase the production, the flow rate?

A It will for a short period, but over a sustained period, it wouldn't.

Q Now, you testified in regard to this testing equipment you were invited to witness these tests?

A Yes.

Q Did you do so only on one occasion?

A On the Continental MJ-1 I happened to catch Continental's tester there, I think on two occasions. I stopped and talked to him there.

Q That is the only one you saw?

A I was by the Continental L1, I think it is one of the ones in the seven wells, and Continental M1 is the only one that I was by at the particular time.the compressor was installed.

Q You never saw the test results until this hearing?

A No.

Q Did you ask for them?

A No.

Q You said that the well on that M-1 that was discharged into what, what was the casing?

A The Continental Axi Apache J1 and J2 definitely had these lines, two lines, a suction and discharge line going to the well, and I am certain the Continental M-1 did.

Q That resulted in unloading the water factor, didn't it?

A Yes, sir, it probably did that.

Q So, that would substantiate the conclusion that a higher flow rate will reduce your water?

A It would where you are circulating a discharge back into the casing and up through the tuck, you would have a higher flow rate through the tubing, not necessarily through the measurement facilities.

Q Do you know whether that gas that was being circulated was ever measured?

A It was not measured.

Q It didn't contribute to any of the problems in any sense of the word, other than the effect on the water?

A Right. It could have more or less stabilized the suction pressure.

MR. KELLAHIN: Thank you, Mr. Dean.

MR. PORTER: Anyone else have a question of the witness?

MR. JAMESON: Our next witness will be Mr. Joe Boyd. Let the record show that this witness was sworn previously.

JOE BOYD

a witness, having been first duly sworn according to law, upon his oath, testified as follows:

DIRECT EXAMINATION

BY MR. JAMESON

Q State your name, please.

A My name is H. J. Boyd.

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Q By whom are you employed?

A I am employed in the Gas Supply Department of Southern Union Gas Company as a reservoir engineer.

Q Would you give us a resumé of your education and experience in that field of endeavor?

A Yes, I graduated with a professional degree of petroleum engineer from the Colorado School of Mines in 1963.

Upon graduation I accepted employment with what is now the Atlantic-Richfield Company in California, where my primary duties were as analytical engineer, basically reservoir engineering.

In September, 1966 I returned to the Colorado School of Mines for graduate study where I received a Master of Science degree in petroleum engineering.

On the completion of my Master of Science degree in 1967 I accepted a teaching and research position on the faculty in the Department of Petroleum Engineering, Mississippi State University.

Consequently, my responsibilities during that term of employment were divided between teaching and research, and in July of 1969, after two years on the faculty at the University, I engaged myself as a consultant petroleum engineer with the State of Mississippi, where a majority of work consisted of reservoir evaluation.

In May of 1971 I accepted employment as a reservoir

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engineer in the Gas Supply Department of Southern Union Gas Company.

I am a registered professional engineer in the State of Mississippi.

Q Since your employment with Southern Union have you had occasion to make a study of the South Blanco-Pictured Cliffs Pool in the San Juan Basin?

A I have had occasion to make a study of certain aspects of this pool, yes.

Q Mr. Boyd, I direct your attention to an exhibit identified for the record as Southern Union Gas Company Exhibit No. 18, and ask you that you explain that exhibit.

A Yes, Exhibit 18 is a tabulation of wells that were cleaned by Southern Union Gas Company personnel.

In addition, we have a tabulation of the location of those wells, the date on which they were cleaned; the 24-hour rate immediately prior to cleaning, and the 24-hour rate immediately after cleaning.

Q Now, I see that you have one with a line drawn through it. What is the significance of that?

A Yes, that well, Axi Apache J14, is not a Pictured Cliffs producer, even though it was cleaned.

Q It is not properly in the South Blanco-Pictured Cliffs Pool?

A That is correct.

Q All right. What conclusion did you draw between the

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figures and the data shown in the column 24-hour rate before cleaning and the 24-hour rate after cleaning?

A Well, the only conclusion that I can draw here is that water in the tuck is a restriction and limits the flow of gas through.

I might also point out in regard to the 24-hour rate before and the 24-hour rate after, by this exhibit, I am not saying or do not intend to infer that is in any measure a sustained rate. That is the 24-hour rate prior to and the 24-hour rate after this physical operation took place.

Q Were these figures calculated from the meter charts of Southern Union?

A Yes, they were.

Q Would it be fair to say from this data that the flow rates from the Continental wells would be substantially less if they were not diligent in keeping their wells cleaned, than it would be if they were diligent in keeping their wells clean?

A I would have to zero in on some semantic definition of "substantial."

Let me leave it this way: Any time you put a restriction in the flow path of a fluid, you are going to limit the flow.

However, to how great an extent this flow will be limited will depend on a number of factors.

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Q Mr. Boyd, I refer you to an exhibit consisting of three pages identified for the record as Southern Union Gas Company Exhibit No. 19, and ask you that you explain those three graphs that are included in that exhibit?

A Yes, Exhibit 19 is a plot of the instantaneous producing rate versus time during the period that the respective Continental Axi Apache wells were on this special compressor test.

Q Is each of these graphs related to a different time?

A Yes, they are.

Q The three wells that are covered by these three graphs, are they three of the six wells that have been previously testified to as being subject to compressor tests?

A Yes, they are.

Q All right. Now, from these graphs, what conclusion can you draw with reference to the data shown on the exhibit?

A Allow me to explain that question in three parts, in that we have three graphs.

The first graph, Axi Apache M-1, the conclusions on this test, I feel, are, in my opinion, limited.

The only conclusion we can draw here is that the production rate at the end of the test was less than at the beginning of the test.

Now, on the following graph, which shows the same information on the Axi Apache L3, here again we are limited

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as to the conclusions that we can draw because of the nature of the test. Now, and again, I will say that the only conclusion that I can draw from here is that the production rate at the end of the test was less than the production rate at the beginning of the test.

Now, I would like to point out one thing, and if the Commission will please note that there is a period consisting of some 28 hours here, that I have labeled as a no flow period, that is not entirely correct. There was an initial six hour flow.

The well logged off for some reason for the following 22 hours, and then the first point that I have on this graph is actually the 28th hour of the test.

On the following graph, this is of the Axi Apache 0-1, I believe this test is perhaps more definitive than those previous tests in that we, during the some seven days approximately seven days that the test was run, we did not have the interruption in the flow, and we can see from the observation of the graph that the production rate is declining, and at the end of the test is still declining.

Now, there is a comment that I wish to make relative to this test, also.

Our meter charts indicate that this well was logged off of production.

Q When you say "this well," which?

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A I beg your pardon. I am referring to Axi Apache 0-1, which is represented here on the third graph.

This well was logged off of production for two full days prior to the start of the test.

The specific dates are October 29th and 30th.

The test period is November 1 through November 9, 1971.

Q All right. Now, let me ask you this. Do these graphs indicate that striking an average rate of flow for the seven day period, as did Continental, gets you to a higher Mcf per day production rate than that indicated at the end of the seven day test period?

A Well, obviously the average flow rate over the seven or eight day period would not be as high as that at the end of the period.

Q And which data--that is, the average rate versus the end of the period rate--is more reflective of what the well would do in the future?

A Well, at the end of the flow rate at the end of the test period would be more reflective of what the well can do in the future than some average, in this case.

Q Did I understand you to say that the average Mcf per day flow rate was lower than the end of the period or--

A If I said that, I was in error, or I meant that the average flow rate for this time period will be higher than the end flow rate, yes.

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Q And the lower end of the period flow rate would be more representative for predicting future performance of the well?

A That is true.

Q Mr. Boyd, I call your attention to the series of 31 graphs that are identified for the record as Southern Union Gas Company Exhibit No. 20, and ask you to explain the data that has been plotted on those graphs.

A Exhibit 20 is a plot of the production rate and the meter pressure versus time for the years 1969, '70, and '71 on the wells, the Conoco wells that are connected to the Southern Union Gas Company Gathering System producing from the South Blanco-Pictured Cliffs Formation.

Q Does this exhibit contain a separate graph for each of the 31 Continental wells?

A I believe that it does.

Q Proceed with the explanation of this exhibit.

A Well, sir, I would call attention basically to the procedures used during the year 1971.

I don't think we need to go further back than that, really.

Let me be general here, if I may, generally what is reflected on these graphs is that during the month of October and partially into November most of these wells peaked out in production.

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Since that time we have realized a decrease in the producing rate, even though we have continued to have, in most cases, a decrease in operating line pressure.

Q From the data available to you and represented by these graphs, what prediction could you make with reference to the production on an Mcf per day basis of the Continental wells for the future?

A Mr. Jameson, I would not make a prediction as to how much each of these wells will produce.

Q I really had reference to the trend.

A Yes, I can comment on the trend and say that in my opinion I do not believe these wells are beginning to reach a stabilized flow period.

What flow rates will be thirty days from now, two months from now, I don't know, but it is my considered opinion that the flow rates in January and February will not be as high as those in December. The December flow rates were not as high as those, for example, in November.

May I point out for the record, I said that in general this trend existed. If we wish to get into it in cross-examination, I can list those exceptions. I have them indicated here.

Q I refer you to a map identified for the record as Southern Union Gas Company Exhibit No. 21, and ask that you explain that map.

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A Yes, Exhibit 21 is an Isopac map on the net pay sand in the South Blanco-Pictured Cliffs Pool.

This map was developed on the basis of SP development of IES logs.

You will observe that I have a color scheme here, that I wish to explain.

The brown color represents what I consider to be no sand development.

The yellow represents sand thicknesses in excess of zero but less than ten feet of net pay.

The green represents greater than ten feet, but less than twenty feet of net pay.

The red represents greater than twenty feet, but less than thirty feet of net pay.

The blue represents greater than thirty, but less than forty feet of net pay.

The purple represents that sand development which is greater than forty feet, and let me call your attention to what is purple, as it didn't show through very good on all of the maps.

I am referring to that section of the formation or that portion of the formation which is contained in Sections, roughly, 18 and 19 of Township 26 North, Range 5 West, and that extends over into Section 13 of Township 26 North, Range 6 West.

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Q Now, have you shown the Continental leases on this map?

A Yes, the Continental leases in the South Blanco-Pictured Cliffs are outlined with a purple border.

Q I notice another forty foot contour up in the north part of the Township 26 North, Range 26 West.

Did you fail to mention that?

A I failed to mention that. There is a small area that I considered to be in excess of forty feet of net pay.

That is partially in Section 5; partially in Section 8 of 26 North, 6 West.

Q Now, what conclusion can you draw from this map with regard to the relative thickness of the pay under the Continental leases as compared to the relative pay thickness on the balance of the producing area shown on the map?

A I constructed this map. Isopac maps are simply one means of several available to differentiate the equality of a well.

Here I have simply differentiated on the basis of net pay thickness, or what I could possibly defend as net pay thickness.

The map indicates that the Continental leases are generally out on the extremities of the pool, and in the thinner portions of the Pictured Cliffs Formation.

Q Approximately how many well logs did you analyze in this South Blanco-Pictured Cliffs Pool for the purpose of

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comparing this exhibit?

A Mr. Jameson, I can't answer that question. I would say a fair estimate would be 300.

I would suspect that was a conservative estimate. I have looked at many, many logs.

Q What conclusion would you as a petroleum engineer draw as to the effect of the relative pay thickness on the ability of a well to produce and deliver gas?

A Well, all other perameters in the flow equation being equal with the exception of pay thickness, the thicker the section, the more production that you have, the higher their production rate.

Q Now, I notice on the map that you have some lines drawn marked A to A Prime B to B Prime and C to C Prime and D to D Prime. What do those lines represent?

A Those refer to my next exhibit, and are those lines, are the paths of cross sections that I made as a means to further differentiate sand quality.

Q Now, does this map show that there is a thick trend in the heart of the pool going from one end of it to the other that completely misses all of the Continental leases?

A If I have interpreted, my logs, properly, yes.

The thick trend does basically go down the middle of the Pool. As evidenced by the color scheme, Continental enjoys very little of this additional pay thickness.

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Q You now said if you had correctly interpreted your logs. Do you have any reason to believe that you did not correctly interpret them?

A No, sir. I have, part of my responsibility as a reservoir engineer is well logging. When I was at the University I taught well logging and this sort of thing.

I believe that I am a competent, at least partially competent interpreter of logs.

I am generalizing here, because there are some relative difficulties in using logs in the South Blanco-Pictured Cliffs.

Q Mr. Boyd, directing your attention to the drawing identified for the record as Southern Union Gas Company Exhibit No. 22, I will ask that you explain that exhibit.

A Well, Exhibit 22 is a cross section on the South Blanco-Pictured Cliffs as outlined on the previous Exhibit 21, a cross section is simply a utilization of logs properly spaced out, and, as a further means of differentiating between the quality of sand.

And let me emphasize further, differentiation between the quality of sand.

If we have--let me put it this way--the Isopac map does not necessarily reflect the quality of the sand. All the Isopac map says, "Well, we think we have got 15 feet here or 30 feet here that will be productive for years."

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An electrolog or a comparison of electrologs, or a comparison of logs on various wells will allow you, at least, to get a qualitative appreciation for sand development in these particular wells that are represented by the logs.

Q Now, what are the results of your study of the South Blanco-Pictured Cliffs wells with reference to the relative quality of the sand in the Continental wells to wells offsetting the Continental leases?

A I think it would have to be agreed that the quality of sand is not as good on the Continental wells as it is in some offset areas.

Q When you say quality, now what are the factors that make up that difference in qualities?

A You can get a qualitative comparison simply on the basis of SP development. You can't draw any quantative conclusion from this. I am not presenting this as a quantitative conclusion, but merely on the basis of SP development you can get a qualitative comparison of the wells.

I point that out by using, as an example, in the C-C Prime cross section, the Amoco Company Jicarilla 55-6, located in Section 31, Township 26 North, Range 5 West, has a fairly good, or is, relatively speaking, it has good SP development.

It is not--there possibly is three or two rather thin shale stringers on that well.

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If we go over to the Amoco Jicarilla 147-3 and the Conoco Jicarilla J-4, both of which are on the Continental acreage, I point out that the Amoco Jicarilla 147-3 does not produce from the Pictured Cliffs. It simply penetrates the Pictured Cliffs on

You will see we do not have significant SP development there.

We have several shale strings throughout what would be classified as the pay zone.

So, simply on a comparison of logs here, I would conclude that the Continental wells probably would not be able to produce as much from the Pictured Cliffs as say the Amoco Jicarilla 155-6 if that well were producing from a Pictured Cliffs.

Q Now, is there any indication on these logs that you have shown on your cross section of layers of shale and clay in the zone that you have shown?

A I am sorry. Would you repeat that question?

Q Is there any indication that there may be shale and clay in the areas that you have shown on this cross section to be covered by the logs examined?

A If I understand the question correctly, yes, there are indications that shale and clay are, that we have what is generally called a dirty sand in here, and I point to the example of Conoco Jicarilla J-6. The SP development here

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in this well is very unstable.

This is believed to be a result of the dirtiness, for example, of the sand in that well.

Q Have you drawn any--you speak now of the dirtiness of the sand. Have you drawn any conclusion with respect to the relative dirtiness of the sand between the Continental wells and other wells in the same pool?

A Well, I will refer back to this cross section C C-Prime. I don't think that it could possibly be argued that the Continental Jicarilla J-6 is "dirtier than the Amerada Jicarilla L-4 even the Amerada Jicarilla F-2."

Q All right, now--

A In short, what is inferred here is that there is more shale and clay in the Continental Jicarilla J-6 than those two other wells that I previously mentioned, that I have just now mentioned.

Q How does that effect porosity in the different areas of the Pool?

A In the inclusion of any material other than sand or inclusion of shale and clay into the pores of the sand, it will decrease the available porosity for whatever fluid may be present.

Q Now, based on the work you have just testified to, can you draw any conclusion with respect to the relative permeability of the Continental wells to other wells in the Pool?

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A Well, here again, I must emphasize that this is true in a qualitative way. It is generally accepted and generally an accepted fact that shale and inclusion of shale in clays reduces the permeability of the productive formation.

Q Based upon the data, all of the data that you have just testified to, what is your opinion with reference to the ability of the Continental wells to produce and deliver gas as against the relative ability of other wells in the Pool to produce and deliver gas?

A Well, I can't totally select 31 Continental wells and say that they are going to produce less than any other wells in the field, because obviously there are a few wells that qualitatively you would have to rate.

I think an example of that is the Kelly Oil Company Roberts No. 3, which is on cross section A A Prime.

Now, if we get away from these exceptions and we look at the South Blanco--Pictured Cliffs Formation as a total entity, I would assume I would conclude that the Continental wells do not have the ability to produce, all other things being equal, at a production rate as high as the other wells.

Q Now, Continental has drawn a lot of comparisons between the Caulkins wells and the Continental wells. Would that conclusion be applicable to those two classes of wells?

A I think it would be, yes. My study of logs indicated better sand development and thicker sand development in the

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Caulkins area as opposed to the Continental leases.

Q Mr. Boyd, I will ask you whether or not the presence of the water in a dirty sand compounds the production problems in excess, far in excess of the presence of the water in a much cleaner sand?

A Mr. Jameson, I can't answer that question as it is asked because there are many, many things involved.

Certainly the presence of a mobile liquid phase is going to reduce flow of a dry fluid phase.

Q I really had reference, and perhaps you misunderstood me, to the relative permeability and expansion and effect of expansion of clays due to water in the formation in a dirty sand as opposed to a clean sand?

A I am sorry. I am not reading the question properly.

Q We know from production history of these wells that there is a water problem in producing these wells.

A O.K.

Q Now, I am asking whether or not the effect of that water problem in the Continental wells with a dirtier sand and with clay that can expand with water contact, isn't compounded in its effect on production rather than the existence of that water in a much cleaner sand?

A Oh, I think generally this would be true. It reduces the cross section shale area that the gas has to flow through.

MR. JAMESON: Let's end it at that.

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We will tender the witness for cross-examination.

MR. PORTER: Would you like to submit your exhibits?

MR. JAMESON: Right, that is right.

Q (By Mr. Jameson) Mr. Boyd, I will ask you whether Southern Union Gas Company Exhibit 18, 19, 20, 21, and 22 were prepared by you or under your supervision?

A Yes.

MR. JAMESON: We tender those exhibits into evidence at this time.

MR. PORTER: Any objection?

The exhibits will be made a part of the record and I believe there may be a few questions of this witness, so why don't we come up about 1:15?

The hearings will be recessed until 1:15.

(1:15 P.M.)

MR. PORTER: The hearing will come to order, please.

The witness is available for cross-examination, and Mr. Kellahin, do you have a question?

MR. KELLAHIN: Yes, I do, several, I am afraid, sir.

CROSS-EXAMINATION

BY MR. KELLAHIN

Q In giving your qualifications you said you had a professional degree. I don't recall what you said it was.

A I have a professional degree of petroleum engineer.

Q Than you have a master's?

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A Master of Science in Petroleum Engineering.

Q What is your bachelor's degree?

A I don't have a bachelor of science degree. My first degree was the professional degree.

Q Then you went on and got the---

A Yes.

Q You had considerable experience in reservoir engineering work, have you not?

A Oh, that has comprised the largest portion of my responsibilities.

Q In doing reservoir engineering work you have had occasion to examine logs frequently?

A Yes.

Q That is what you did in this Pool?

A I did examine several logs in this Pool, yes.

Q I think you testified something like 300?

A That is a very arbitrary number. Let me say I examined many of them.

Q I don't mean to pin you down to the exact number, but you have examined a large number of logs?

A Yes.

Q Did you have the logs on all of the Continental wells?

A No, sir, I did not have all of the logs on the Continental wells, and to a precise number, I don't recall how many I did have.

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Q Well, did you have enough you felt satisfied that they were representative of the area owned by Continental Oil Company?
A I think so, yes.
Q Yes?
A I did.
Q Now, in connection with your work, you made considerable analyses of pressure production data, have you not?
A In regard to the South Blanco-Pictured Cliffs?
Q No. I mean in your experience generally you have done this type of work?
A Yes.
Q Did you do it in this case?
A To the extent that is shown on the exhibit here.
Q To the extent that is shown here?
A In the Exhibit 20.
Q Exhibit 20?
A Yes.
Q That is the only exhibit you are referring to in connection with your pressure rates? You didn't do anything on pressure rates, actually, did you, like a pressure production decline curve?
A No, the only thing I did on the pressure rate is presented in Exhibit 20.
Q In connection with your analysis of these logs, you say you utilized the logs and the SP curve to establish net pay?

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A Yes.

Q How do you read net pay from a SP curve?

A Well, the basis that I used was basically to utilize that sand development between the inflection point on the SP curve.

Q What did you consider net pay?

A Well, in some of the areas that obviously had a lot of shaleliness, ten, ten to fifteen millivolt development.

Q Ten to fifteen millivolt development?

A Yes.

Q Did you attach a porosity figure to that net pay?

A No, sir, I did not.

Q Did you consider permeability in connection with your net pay figure?

A No.

Q Did you examine any logs in arriving at your conclusion in regard to the accuracy of your examination; did you examine any core data?

A Yes, I examined some core data, and that is basically why I didn't--I examined the well core data and tried to make some sense out of that relative to the logs. In this respect, in that I tried to see if I could maybe calibrate it, get some relationship, but that proved to be not worthwhile.

Q You are saying then the logs are worthless for examining

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this reservoir?

A No, I am not saying that.

Q What are you saying?

A I am saying that I will readily admit that the logs are more limited in evaluation here than they would be in a very clean hetrogeneous sand.

Q But the logs would also reflect the cores, it would reflect the character of sand, would they not?

A Yes.

Q It would be a valuable tool in determining how much productive pay was in the zone, would it not?

A Well, it would be a valuable tool if you had the complete core of the well, yes, and you had the necessary logs to correlate this to.

Q Well, you said you had logs. Did you have the logs on any Continental wells?

A Yes, I did.

Q How many?

A I have already told you. I don't recall a specific number. I had several logs on the Continental wells.

Q Did you have as many as five?

A Oh, I had perhaps twenty, perhaps even more than twenty. I am talking about the Continental. That is what I am talking about.

Q You had about twenty?

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A I had several logs.
Q How many cores did you have on the Continental wells?
A I did not have any cores on the Continental wells.
Q None at all?
A No.
Q Does your company have those cores available?
A If they do, I was unable to find them.
Q Now, in your analysis of net pay what factor do you take into consideration; how do you arrive at that figure?
A Well, as I explained in direct testimony, I developed the net pay on the basis of SP development, and I have explained to you what my basic criteria was.
Q That is that you considered, as far as the development, the Isopac maps?
A That is true, which is Exhibit 21.
Q You didn't give any consideration to the permeability or porosity of the Formation in arriving at this conclusion?
A Sir, the permeability and porosity, the basic information, basic information on the formation is very sparce out here.
Q Well, did you or did you not consider it?
A Let's have that question again.
Q Did you consider permeability and porosity in arriving at your net pay Isopac map?
A In a quantitative method, no.
Q Now, referring to your Exhibit No. 18, that applies only to

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Continental wells, doesn't it?

A Yes, it does.

Q Did you make the same comparison for any other wells in the Pool?

A I had no other information indicating to me that other wells in the Pool had been cleaned by our personnel.

Q You state that this did not reflect a sustained rate of production?

A I did.

Q Then why do you offer the exhibit?

A Simply to show that a restriction is in the tuck, and at least, as long as my conclusion was this, that liquid in the tuck string will lower the flow rate through that tuck string.

Q It will also show if it is not a sustained rate that they would revert back to their prior status; is that what you said?

A I don't think I said that at all.

Q Would you say that--you cleaned out the wells, they started producing. Let's take the Axi Apache J-1, produced 340 Mcf per day?

A Yes.

Q That is a top allowable well, is it not, or do you know?

A Sir, you are asking me something I am not qualified to

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testify on. I have not in any regard made comment to allowables, the Commission status of the wells, the deliverability. I have testified purely as to production rate, and Exhibit 18, I think, is fairly self explanatory, and the conclusion is straightforward, as I made in direct testimony, in that liquids were removed from the well, and the production rate after that liquid removal was higher than the production rate prior to its removal. That is the sum total of my conclusions for this exhibit.

Q Now, these rates were all taken at the same line pressures, I assume?

A I do not know what line pressures these were taken at, specifically.

They are all attached, connected into the Jicarilla Gathering System.

I think that prior testimony has indicated that line pressures along that line are comparable.

Q Now, you have a 24-hour rate before cleaning. When was that rate established, for what period of time?

A In most cases, it was the immediate 24 hours preceding the cleaning.

Q But not in every case?

A Well, the ending period before cleaning ends at the time the well was cleaned, and in all cases did not go back a complete 24 hours.

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Q Did you calculate the rate then?

A Beg pardon?

Q Did you calculate the rate for a 24 hour period?

A Yes, it only went back 20 hours, for example, the rate of the total production during that 20 hours was determined, and then this was made relative to a 24 hour rate.

Q And the same is true then on your 24 hours after cleaning. Was that produced for 24 hours? Is that an accurate figure?

A The beginning of the 24 hour rate after D starts immediately after the well was back on the meter, yes.

Q You ran it for 24 hours, so you didn't have to make any calculations on the allowables?

A I think in most cases that I did. I don't know that. I don't recall exactly how long those flow rates existed after cleaning.

Q Now, referring to Exhibit No. 19, this only reflects the information on these wells on the test that was performed by Continental Oil Company; is that correct?

A This Exhibit 19 is a plot of the production rate versus time during the compressor test, the special compressor test.

Q Is this source of information from the charts?

A Yes.

Q Were those furnished back to Continental Oil Company?

A Continental, it is my understanding, that Continental got a copy, a Xerox'd copy of these charts.

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Q Now--
A I cannot vouch for that. I did not send them a copy.
I am told that they were sent a copy.
Q Do you make this type of computation every time a deliverability test is made?
A Let's stay away from deliverability.
Q I am asking you about a deliverability test. This was a well test. Do you make any computations on any other tests as to performance?
A My concern was instantaneous production rate at any particular time, producing rate, not to be confused with whatever deliverability might mean.
MR. PORTER: I have often wondered what it meant, myself.
Q (By Mr. Kellahin) You say that this shows that the production was declining, and yet on the Axi Apache M-1 it reached a bottom point and then started climbing again, did it not?
A Yes, sir, that is true. There are two points that have post slope.
Q And the same is true on the Axi Apache L-3?
A That is true. There at the end, nearing the end of the test the slope does increase.
Q That doesn't indicate the production was declining, does it?
A Well, if you take this from the 92d hour to the 94th hour, during that particular time period, certainly there are

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going to be variations, but I am looking at the total test time from time zero to near the end of the test period.

Q The only well that showed a decline, actually, was the 0-1?

A No, sir, that is not true.

Q The only one on the exhibit, then?

A No, sir, if you will examine Exhibit 19, the first graph, you will see that the initial production rate was about 56 Mcf's per day.

If you will examine the input of that graph, that is 44 a day, that is a decline.

Now, if you will go to the second graph on Exhibit 19, you will see that the initial production rate that I have plotted here was 345; the final production rate was about 135, I believe.

That is a decline to me.

Q Now, Mr. Boyd, when you put a well on test after it has been shut-in, isn't it normal that the production rate will be high initially and it will decline until the well stabilizes?

A When you shut a well in, and then put it on the test, yes, you would expect some of what has been described here before as flushed production, whatever that is.

Q Well, in your opinion, have these wells stabilized at a rate shown on these exhibits?

A No, sir, I don't think that they have come to the point to

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where--now, when we talk about stabilizing, let me apply my own definition to that. When a well is stabilized it should be able to produce at about the same rate over at least a 24-hour period, and none of these graphs indicate that this well is producing at a stabilized rate over a 24-hour period.

Q Actually, it is showing an increase on two of them, isn't it?

A Well, if you look at it from about the 72nd hour of the test to about the 96th hour of the test, and then about the 120th, and about the 144th hour of the test, yes, there was a small increase there, but I fail to see how we can pick the graph apart and look at only those two segments, particularly in view of the fact that the chart indicated an interruption along the flow period.

Q How many well delivery tests have you ever witnessed? Have you witnessed any?

A No, sir, I did not.

Q How many have you examined the data from them?

A Are you talking--if you are referring to the State Oil Conservation Commission Deliverability Test, I think I should decline to comment on that because I have specifically talked about production rates as opposed to whatever the statutory deliverability is.

Q Isn't a production rate a factor in the state deliverability test?

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A Sir?

Q Do you know?

A You are getting on ground that I know a little about the statutory requirements, but I am not nearly as familiar with them as some people are, and I purposely stayed away from this.

Q Well, Mr. Boyd, you may have purposely stayed away, but did you not hear Mr. Mattes testify yesterday these tests, you attempt to analyze here were conducted on the same basis as the deliverability test required by the Commission?

A Yes, I heard him testify to that. I am not disputing that. All I am simply saying is that I have plotted the instantaneous production rate versus time during that test, and in my opinion, sir, we do not have a stabilized flow rate. That is all I am saying.

Q Well, how did you happen to pick those three particular tests?

A I think that you are getting to why I did not include all six of them.

Q Yes, sir.

A Let me state, sir, that I looked at not only six, but I believe eight compressor tests, or eight wells that the compressor was on.

There were several reasons why I didn't do it. I think the best reason is explained on Exhibit 20.

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The Axi J-1 was one of the wells that was on a compressor test.

You will see that in October, if you examine that graph, in October the production rate peaked out, it declined in November, and it declined some time further in December, and my having three more graphs just adds more volume to the already voluminous exhibits.

Q In connection with your Exhibit 20, Mr. Boyd, I don't want you to discuss those where we didn't show a decline. I think it is obvious that they are still producing at higher rates from your graph itself, but in general, for example, let's take the Apache J-3 lease.

A Sir, shall we take all of the exceptions?

Q No, sir. We will take the Apache J-3 lease. If your counsel wants to question you about any others, he may do so.

A The third graph. The well--

Q Yes, sir, the third graph in your Exhibit 20.

A O.K.

Q Now, that shows a slight decline from November to December, does it not?

A Yes, it does.

Q But it shows substantially more production during those two months than for any other month on your graph '69-'70, and '71?

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A Yes, that is true.

Q Is that also true, for example, on the Apache J-7 lease, not so striking a difference, but production still is climbing and it is producing more than it produced at any other time?

A Yes, it is still--the December rate was higher than at any other time in 1969, '70 or '71.

Q Now, here is another one that declined, the Apache J-12 lease. That produced during November substantially more than it produced any other time during the period shown on your graph, and it was producing at the end of December more than it produced any time during 1970 or 1971; isn't that correct?

A Yes, it did produce more in December than it did through '70-'71.

Q So the result is reducing your line pressures has increased the production for at least some of Continental's wells, has it?

A I don't think that has been denied, sir.

Q Now, on Exhibit 21--we have discussed that somewhat already --but I will have a couple more questions.

Did you consider the method of allocation as reflecting your net pay as being indicative of what an operator is entitled to?

A Sir, you are getting back into an area that I have already

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stated that I am not qualified to testify about.

I am not familiar with the allocation procedures that are applied to here.

I mean, in Exhibit 21, I have simply tried to in one fashion differentiate as to the relative quality of the sand, and in Exhibit 21 that aspect of quality has to do with sand development, pay thickness.

Q Are you offering this exhibit with the view to show what each operator is entitled to produce?

A No.

Q You don't say that has anything to do with it?

A Certainly sand thickness has something to do with what a well is capable of producing.

Q I am not talking about what it is capable of producing. I am talking about what it should be permitted to produce.

A That is totally outside the area of my responsibility, and I cannot testify to that.

Q Now, have you calculated the gas reserves underlying each tract here?

A No, sir, I have not. I did make a sand volume calculation, which I have not included as an exhibit.

Q That is an allocation you could make, is it not?

A The reserves?

Q Yes. I mean, you have the ability to make it and the information necessary to do so?

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A I have the ability to make it. Results anyone can argue with results. All the quality of data input is a very simple process to calculate gas.

Q What you are saying is engineers don't agree any better than lawyers?

A That is basically it, yes, yes, sir.

Q Could you also calculate on the basis of the information available to you drainage from one tract to another?

A No, sir.

Q You cannot do that?

A No, sir.

Q You do not have the ability or you do not have the information?

A I have the ability. Here again, we go back to the engineer-lawyer. I don't think that we would be in agreement.

Q That is what you are saying?

A Right. We say that we may not necessarily be in agreement.

Q On your cross section you refer to an Amoco well which you said had better sand development, therefore it will produce more gas?

A I think, sir, that I was referring to the Amoco Jicarilla 155-6. Is that the one you are referring to?

Q Yes, I believe that is correct. I didn't get the number.

Now, you say that well will produce more gas, I believe was your testimony; isn't that correct?

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A If all other perameters are the same.
Q If only the sand thickness---
A The sand thickness is different?
Q Yes.
A Everything else the same except the sand thickness?
Q Yes.
A The well in the thicker sand will produce more gas, more fluid.
Q Do you know what pipelines that well is connected to?
A No, sir, I don't. As a matter of fact, I don't believe that this well is a Pictured Cliffs producer.
Q So you are comparing the sand thickness in some other formation to the Pictured Cliffs?
A No.
Q What are you comparing it to then?
A This is the Pictured Cliffs Formation. The casing--if I am not mistaken--the casing simply wasn't perforated in the Pictured Cliffs.
Q So, Amoco is not producing that as a Pictured Cliffs well?
A I don't think so. I don't know, really don't know.
Q You have some other wells on there, Amerada's, are they connected to the Southern Union in the Pictured Cliffs Formation?
A The Amerada wells are not, they are not.
Q Are they producing from the Pictured Cliffs?

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A Yes, sir, I believe they are.
Q Do you know what line pressure they are producing against?
A I don't know what those line pressures are right now, no, sir.
Q Now, have you made any comparison of the deliverability of the various wells you have analyzed here to determine the quality?
A Sir, you get back to deliverability.
Q You haven't done it?
A I explained to you that what I am interested in as a reservoir engineer is production rate, not deliverability.
Q Well, Mr. Boyd, you keep evading the question. Doesn't the deliverability test show then the delivery rate; is that not one of the figures shown on the test?
A Do you want me to plead complete ignorance to that?
Q If you wish.
A All right. I will have to tell you that I don't know.
Q You don't know what the deliverability test does?
A I don't know what all is involved in the deliverability test.
Q Then you don't know anything about the application of the Commission proration formula; is this your testimony?
A That is true. Well, I know very little about it.
Q You don't know enough about it to testify whether it is effective or not to give ratable take to wells in the pool?

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A No.

MR. JAMESON: Mr. Porter, I think we have gone far enough on this line of questioning. The witness has qualified himself as a reservoir engineer, not as a proration expert. I believe it is time for this line of questioning to come to an end.

MR. PORTER: I think it has.

MR. KELLAHIN: That completes our cross-examination.

MR. PORTER: Anyone else have a question of Mr. Boyd? The witness may be excused.

MR. JAMESON: That completes our rebuttal case.

MR. PORTER: Do you have another witness?

MR. KELLAHIN: I would like to recall Mr. Mattes for some very brief questioning.

MR. PORTER: I see. Let the record show that Mr. Mattes is still under oath.

This is the same Mr. Mattes who testified before.

MR. KELLAHIN: I believe that will be our Exhibit 23.

RE-RE-DIRECT EXAMINATION

BY MR. KELLAHIN

Q At the hearing yesterday a series of exhibits were presented by Southern Union Gas Company, apparently purporting to show that the production from Continental wells could not be continued at a sustained rate and that they were in fact declining, and I refer particularly to their Exhibits 4, 6,

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and 8.

Did you review those exhibits?

A Yes, I did.

Q And on the basis of your review, what analyses have you made?

A Well, I have made an analysis of the data that is contained in Southern Union Gas Company's Exhibits 4, 6, and 8.

Q Before you start, would you please identify those three exhibits?

A Exhibit 4 is the average producing pressure; Exhibit 6 is the production; Exhibit 8 is the producing days.

Q Did you make a composite exhibit showing the results of comparing those three exhibits?

A Yes, sir, I did. I added up all of the numbers on all three of these exhibits by operator, and then divided that total by the number of days at a point which had been included for that operator to arrive at an average for that operator for the producing pressure for the production and for the producing days, for the period, the seven-day period ending January 1 and the eight day period ending January 9.

Q Referring to Continental's Exhibit No. 23, would you discuss the information that is shown on that exhibit?

A Yes, if you will look at Exhibit 23, it shows a heading analysis of Southern Union exhibits.

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The first one, the operators are tabulated under.

In the second column, the production from Exhibit 6 has been totaled for the seven-day period ending January 1.

The next column shows the producing days or well days, if you will, I believe the term was used, for the same period ending January 1.

The next column, which is the third column, headed January 1 Mcf per well day, merely, that is simple arithmetic that results in, that is the answer that results dividing the total production by the average number of well days, and if you will look at the column for Aztec, that number is 68. That says that from the information that Southern Union has provided us in the three exhibits, as far as Aztec Oil & Gas Company goes, the average well that was on production during the seven day period ending January 1, 1972, produced 68 Mcf's of gas, and then what I did is I took the same period data on Exhibit 4 for the fourth column and totaled up all of the pressures that are tabulated for all of the wells, and divided by the number of data points, which gave me an average producing pressure for all of the wells.

The next column is the same data as in the first data column, except that it reflects the production for the eight day period ending January 9, and I guess that is the sixth column, and it has got the same number in it as the second

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column, and the seventh column has got the same number in it as the third column, and the eighth column has got the same number in it, or the same equivalent number in it as the fourth column.

I made these calculations in the room partly and---

Q Let's go right across these columns to clarify this a little bit.

Let's take the first one.

What is shown in column 1, key to Exhibit 6, what is that for?

A What is what, sir?

Q What is the four shown in the first column? It says Exhibit 6.

A That is the production for each operator for the period ending January 1st.

Q O.K. Now, take the second column.

A That is the number of well days the operator produced.

Q Then the third column?

A Is the result of dividing the total production by the number of well days to find the average Mcf's per well day.

Q The average Mcf's per well day?

A That is right.

Q Going across to the next column?

A That is the average of all of the pressures that are reported on Exhibit 4 divided by the number of pressures

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reported for each operator.

Q Would that then give you an average pressure per well?

A Directional, that is right, yes, sir.

Q This next column, what is that based on?

A That is based on the same information as is on Column 1.

Q But you extended it for the period?

A Ending January 9?

Q Ending January 9.

A Right.

Q Then the next column?

A It is the number of well days for each operator for the period ending January 9.

Q Now, we go to the next column.

A That is the division of the well days of the eight day period ending January 9 into the total production of the eight day period ending January 9 to get an Mcf per well day for that operator for the eight day period ending January 9.

Q The next column, that is the average of the pressures?

A That is right, sir.

Q Now, we have got those all identified all of the way across. Would you show what the differences are between the different operators?

A Yes, I would. What I did was I just made the simple

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arithmetic subtraction of the numbers that were included in the January 9 data; from those numbers I subtracted the comparable values for the January 1st period, and I made this subtraction for the pressure and for the average Mcf per well day, and I have tabulated the results of the simple arithmetic calculation in the last two columns over the past--you will notice the asterisks by the heading, if you will look at the bottom of the page, the first column shows the production change on a per well basis, 1972.

Q You said per well?

A Per well day, that is right. The last column, which is a double asterisk, the average producing pressure changed from 11 to 19, 1972, and this comparison brought me to a very interesting quantative conclusion, and it is a matter of just simply comparing the change in pressure with the change in production.

The interesting thing is that all of the pressures on the average for all of the wells in the South Blanco-Pictured Cliffs Pool connected to Southern Union went down.

The amount changed by varying amounts, but you will notice in the last column that all of the producing pressures for the eight day period ending January 9th were less than the producing pressures for the same seven day period ended January 1.

Now, if you will look in the next to the last column,

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which shows change in production, the only guy there whose production is increased is Continental, and the increase that I have shown on this exhibit is 3 Mcf per day, and I believe that it is already been the number of comparable numbers, that I remember, is two, but I think my number is three.

Q Now, that doesn't sound like very much gas.

What is the significance of 3 Mcf's per day change during this nine day period?

A Well, if you take the 3 Mcf's per well day and then you multiply that 3 times 31, that producing 93, 93 Mcf's, if you will compare the 93 Mcf's with the 67 Mcf per well day that is the average for the Continental wells, that 3 Mcf per day difference represents nearly the addition of another well and a half to our system, a 3 well and a half, if you will.

Q Now, even at the prices Continental is getting, that is a significant amount of gas, is it?

A That is a significant amount of gas.

Q Now, are all of the figures shown on our Exhibit 23 derived from the exhibit offered by Southern Union Gas Company with the exception of the last two columns, and they are computations based on those figures?

A The data, the first column and the fifth column data were taken directly from Southern Union Exhibit 6. The second

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column and the fifth column, sixth column, second column--excuse me--and the sixth column were taken directly from Southern Union's Exhibit No. 8, and the multiplication--excuse me--I mean the division represented by the number in the third column and the eighth column is mine.

And the pressures shown in the fourth column and the eighth column were the pencil averages that I made myself, and they were averages of the data that was provided by Southern Union.

Q Now, I would like to offer Exhibit 23.

MR. PORTER: Any objection?

MR. MORRIS: No objection.

MR. PORTER: Exhibit 23 will be admitted.

Q (By Mr. Kellahin) I have one further question. You heard Mr. Haseltine testify yesterday to the effect that we had made well tests for the purpose of changing our deliverability. Did you hear that testimony?

A Yes, I did.

Q Did we in fact change the deliverability on any of the wells by these tests?

A Yes, we did change them.

Q Would you outline briefly what those changes were?

A Yes, my exhibit of yesterday that summarized our special deliverability test--and I believe it was my Exhibit No. 7 --shows that the special deliverability test, deliverability

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for J-1 was 184 Mcf per day, while the deliverability test that was run on that well in June, 1970, was 112, and so that deliverability did change, and it went up for the J-2, the 1970 deliverability was 109.

In the special deliverability test, that delivery was 110.

That one changed, too, but it was very small, and it went up only slightly on the L-1, with 1970 deliverability test showing 70 Mcf per day, and our special deliverability test showed 87 Mcf per day. That is a small increase. The L-3, the 1970 deliverability test was 55 Mcf's a day and the special deliverability test that we ran showed 119 Mcf per day, a substantial increase. N-1 had a 76 Mcf per day deliverability test in 1970, and a 32--on our special deliverability test. That is a substantial reduction.

For the O-1 the 1970 deliverability was 51, and our special deliverability test was 56, and that difference of 5 Mcf's is pretty much the same, I guess.

Q Has Continental in any way attempted to use this test as a means of obtaining assignment of allowables to these wells?

A No, sir, we have not.

Q Was that your purpose in running the test?

A The tests were purely to gather data on our wells.

Q What was the significant data you were seeking?

A The significant data we were seeking was the quantity of

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gas which the wells would produce, and I might add that in every case the quantity on these tests that I have tabulated on these exhibits, that quantity was substantially higher than that shown in the 1970 deliverability test, and I believe I have already testified to that.

MR. KELLAHIN: That is all I have.

MR. PORTER: Any questions?

MR. MORRIS: Yes, sir.

RE-CROSS-EXAMINATION

BY MR. MORRIS:

Q Mr. Mattes, as I understand your Exhibit 23, you have looked only at Southern Union's Exhibits 46 and 8, which pertain solely to the information on the two recent chart periods from January 1 to January 9.

A That is right.

All of the data that is tabulated on the chart and all of the arithmetic whose results are shown on this chart quantatively was obtained from the data in Southern Union Gas Company Exhibit 4, 6, and 8.

Q Now yesterday you on your direct case presented an exhibit, which I believe was Exhibit 20, which showed a comparison of monthly production versus time, that went up through November of 1971; is that correct?

A That is correct.

Q It did not have the December figures on it?

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A No, sir, I testified that it did not.

Q All right.

Now, let me ask you, in making this analyses, instead of just taking the period from January 1 to January 9, why didn't you go back and take the December figures that were supplied to you yesterday so that you would have a more meaningful period of comparison?

A Mr. Morris, the answer to your question is that data that is contained in Exhibits 4, 6, and 8 and the values that are tabulated thereon have never been before available to me.

Q All right. I believe you testified when I cross-examined yesterday with respect to your Exhibit 20 that you didn't know what the December production figures were, either, that those had not been available to you.

A What I said was that I had the December production figures for six wells of special deliverability tests.

Q All right. Now, in our exhibits that we have introduced yesterday, and I refer specifically here to Exhibit 3, Exhibit 5, and Exhibit 7, we provided to you the December figures on average producing pressure and producing days.

Now, you have chosen to ignore that December information and instead have gone strictly to Exhibits 4, 6 and 8 to make a very short-term comparison of information with respect to Southern Union's exhibit.

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My question simply is why didn't you take into account the December production figures so as to give a wider range of comparison?

A Mr. Morris, I guess the answer to your question is that the amount of time I had available was insufficient to totally analyze the chart, the exhibit that related to the twelve month production.

Q I am not talking about twelve months. I am just talking about adding in the one month of December to the first eight days of '72 to give a little a little bit broader base to your analysis.

Let me ask you, did you make an analysis of the December production on a per well day basis?

A No, sir, I did not.

Q You don't know what that would show?

A No, I do not know what that would show.

Q Do you know in a qualitative way that that would show a decline on Conoco's production on a per well day basis?

A Would you repeat the question, please?

Q If you had taken December?

A Yes, sir.

Q As well as the first eight days of '72 and made the same computation, is it not your suspicion instead of this showing an increase on Continental production it would show a decrease; in other words, if you broadened your study?

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A If I broadened my study to include December, 1971?

Q Yes.

A I think I can answer your question for you if I might just be permitted to look at these exhibits.

I sure can, if I can take a minute.

I will need to do some arithmetic. If you guys have got the time, I have got the money. You want me to do, again now, Mr. Morris, to be sure I understand you, I want to answer your question. You want me to broaden the scope of this exhibit I have prepared to include December production?

Q Well, if this can be done within a reasonable time.

A It wouldn't take five minutes after I understand what you want.

Q Can this be done for all of the operators here?

A I can't do it. I don't have any--yes--no, I really can't do that, not in some reasonable time.

Q Will the figures as shown by our exhibits 3, 5, and 7 enable the Commission or the Commission staff, if they desire, to make a computation?

A I am sure they could make it, just like I have.

Q The fact remains, Mr. Mattes, you have not presented--let me just make clear what I guess is already obvious. Your study is only for this information on an eight day period.

A My study covers the change in production for all of the

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wells of the South Blanco-Pictured Cliffs Pool based on data presented by Southern Union Gas Company for the seven day period ending January 1, and comparing that production to the eight day period ending January 9.

MR. MORRIS: That is all.

MR. PORTER: Anyone else have a question?

The witness may be excused.

Does anyone have a statement to make in the case, statement of position, other than Mr. Morris and Mr. Kellahin? I am sure they will have a few words.

MR. MORRIS: How would you like to proceed, Mr. Porter?

MR. KELLAHIN: I would say we have the burden here. We should have the right to close. We should probably have the right to open, but I would as soon let Mr. Morris go ahead.

MR. PORTER: Do you agree with that, Mr. Morris?

MR. MORRIS: I agree Mr. Kellahin certainly has a burden, which I see as insurmountable.

I will try to be somewhat brief, Mr. Porter.

This, I am sure the evidence here is, of course, very clearly in the minds of the Commission at this point, and I see little need to review the evidence or to try to point out its features.

I would simply ask the Commission in considering the evidence that has been presented to consider the nature of the case that has been presented here by Continental, the quality of

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the case, the quality of the evidence presented.

The case that has been presented by Southern Union, frankly, Southern Union, I am sure any purchaser considers it quite an important case, quite a serious matter to be charged as we have been charged by this Application on a violation of a Common Purchaser Act, and unreasonable discrimination.

The only thing unreasonable, we believe, in this matter is the fact that we are being charged with the violation of this Act.

Now, Mr. Kellahin, Continental, I don't mean Mr. Kellahin, but Continental has attempted by this proceeding to put blinders on the Commission, to say to the Commission, "You can only look at one aspect of what is going on in the South Blanco-Pictured Cliffs Pool. That is simply a difference in facilities afforded."

We admitted in our opening statement to the Commission that there were differences in the facilities afforded.

Mr. Haseltine on the stand freely admitted that there are differences in the facilities afforded in this Pool.

The question before the Commission is whether the differences in facilities afforded are unreasonable in view of the other factors that by Statute the Commission is charged to consider in considering whether there has been ratable taking in the field.

You consider the question of whether there is unreasonable discrimination, as has been, I think, hammered at time and again

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throughout this proceeding, not only is the question of equivalent facilities a factor to be considered by the Commission, but of course, the questions for consideration are pressure price, length of time the gas is available to the gas purchaser, quantity and quality of the gas available.

Now, we believe that the evidence here has shown that the differences in price, the differences in the quality of the wells, of course, affects the quantity and, if you will, the quality of the gas as well as the difference in the length of time that the gas is available to Southern Union.

All of these things are factors which heavily offset the differences in facilities afforded to Continental in this case. It was not Continental that came forward in its own case, as we believe it should have, as we believe it had the burden to do, that came forward and made the comparisons that the Commission is charged by statute to make in a case of this sort.

It was Southern Union that came forward with the evidence on which the comparisons could be made.

We produced evidence relating to all of these factors, not only on the Continental wells, but on the wells of other producers connected to Southern Union's Gathering System, so that the comparisons could be made by the Commission.

We believe it has been pointed out to the Commission here that price considerations are an integral consideration in not only this pool but in the gas business general in the San Juan

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Basin, to be considered along with the facilities afforded.

As Mr. Haseltine testified this morning, that after these gas purchase agreements are entered into and negotiated, signed, then the purchasing company proceeds on the basis of these purchase contracts that have been freely entered into, arms length contracts, to design their gas gathering systems, to design the pressures at which they will operate, and not only does the purchaser know but the producer knows that in his negotiation of these gas purchase agreements the price that he is willing to accept will have a bearing upon the pressures that he has a right to expect in the gathering system to which he will be connected.

Now, part of the Common Purchaser Statute relates to what constitutes unreasonable discrimination, and as we have pointed out, the reasonable differences in prices paid, facilities afforded, will not be considered if they bear a fair relationship to the other various factors to which we have referred.

We believe the testimony here shows that they do bear, that the differences that are shown here between all of these factors do bear a reasonable relationship to each other, so that there is no discrimination against Continental, just as there was no discrimination against its predecessor, the Humble Oil & Refining Company at the time they entered into this contract.

We would like to call the Commission's attention to Sub-section F of the Common Purchaser Statute, which we mentioned at

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the beginning of this proceeding, which in effect says to the Commission that the Common Purchaser Act shall not be applied to require the purchaser to take gas under a pressure that would be uneconomic or unsatisfactory to the gas purchaser as to its gas transportation facilities then in service.

In other words, the Act cannot be applied so as to require Southern Union, in this case, to make an expenditure of funds to place new gas transportation facilities in service.

This, I believe, is in keeping with the general rule of law that the Conservation Commission, and perhaps other types of administrative agencies, should not construe their statutes to require as an affirmative act the expenditures of funds, in this case on the part of the gas producer--excuse me--the gas purchaser.

Now, throughout this hearing, Continental has referred to its correlative rights being violated.

We believe the Common Purchaser--well, let me back up--we believe that the definition of correlative rights as set forth in our statutes should be examined.

This starts off saying it is the opportunity afforded to the producer to produce his just and equitable share of gas, which is then defined, further defined.

We believe in a prorated gas pool that opportunity is afforded the producer through the Commission proration formulas and procedures.

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Now, in order to avail itself of that opportunity, Continental here has several alternatives, several avenues open to them.

In the first place, a producer can alter his own correlative rights by waiving, by abandoning the correlative rights that he would otherwise be entitled to.

For instance, let's say for some reason Continental wishes to make an agreement under which it would not produce a well for a given period of time, for some consideration, certainly it would have the authority to do that.

Could it then come to the Commission and say that its correlative rights were being violated because under that agreement it wasn't producing any gas? That is an extreme situation, but it is not too extreme, because in essence that is really what we have here.

Continental is the successor to Humble in this contract. If they made, if Humble made a bad agreement or if Continental made a bad agreement when it took over and purchased this system from Humble, or from Humble's successor, Southern Union should not be made its whipping boy, and certainly the Commission should not be placed in a position of doing the whipping for Continental.

If they made a bad deal, we submit that they have to live with it.

By contract, we submit, that Continental or any other producer can alter its correlative rights.

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It can waive its correlative rights, because the proration formula that this Commission administers affords the opportunity required by the statute to the producer to produce his share of gas in the pool.

From that point on, if the producer wishes to abandon or alter that right by contract, it certainly can do so, and we submit Continental and its predecessors have done so in this case.

We are not saying they have abandoned their correlative rights.

We say that they have modified them somewhat by contract.

Now, there was some suggestion made. It was very--I think it came up only once in the hearing--that there was some aspect of waste involved here.

I believe Continental suggested that premature abandonment might result if it did not obtain relief.

First, let me say what is, I am sure, obvious, that at some point in the life of a pool, some point in the life of a well it will be abandoned.

If the economics were not a factor, that well, whatever well it is we are talking about, could continue to be produced until the very last Mcf was dragged out of the well, but obviously there is some economic cut-off point at which the well will be abandoned.

Now, I think it has been shown in this case that the

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economics of gas production and gas gathering are related to this pressure relationship.

It is very significant that Continental has the opportunity reserved to it in the contract of installing its own compression facilities to raise the pressure of gas in order to produce that gas into Southern Union's line.

If it wishes to avail itself of that right, then certainly it has the opportunity afforded to it to not only protect its correlative rights but to prevent premature abandonment.

We believe the Common Purchaser Act itself is a very specific provision of the application of protection of correlative rights.

We do think that the Commission has to go back to the general definition of correlative rights to answer the question that is provided in this case.

We think the single issue in this case is whether there has been unreasonable discrimination, and we believe we have answered that question in the negative, that there has not been unreasonable discrimination, that the differences in facilities afforded do bear a reasonable relationship to the other factors that the Commission is charged to consider, and we respectfully ask that the Commission deny the application of Continental Oil Company in this case.

MR. KELLAHIN: I believe Mr. Morris actually put his finger on the controversy. It is just a difference in

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interpretation that we are talking about.

Their witnesses and ours have both shown there are differences in the facilities afforded Continental Oil Company, and I might add, other operators on the eastern leg of this section which has been referred to as the Jicarilla Section, as compared to the facilities afforded on the western leg of it and the northern segment.

The contention seems to be that because of the differences paid Continental for its gas, the difference in gas facilities is justified and reasonable.

Now, in the first place, I feel Mr. Morris, or as I should say, Southern Union Gas Company, is misinterpreting the Statute.

The Common Purchaser Act does not in any way connect price and facility afforded.

It doesn't say "The transportation facilities afforded shall be modified by the price of gas."

At no point in this entire section.

All it says is that purchases shall be made without unreasonable discrimination in favor of one producer against another in, one, the price paid; two, the quantities purchased; three, the basis of measurement; four, the gas transportation facility.

In other words, there are those four different items on which there can be no discrimination, and you don't couple them and say one modifies the other.

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Now, you go on down in the section, and that is what they appear to be relying on, the statute says for the purpose of this Act reasonable differences in prices paid or facilities afforded, or both, shall not constitute unreasonable discrimination if such differences bear a fair relationship, and this is the only thing you can consider on the prices paid or the facilities afforded, if they bear a fair relationship to differences in quality, quantity, or pressure of the gas available or the relative length of time during which the gas will be available to the purchaser, and the only point they could make in that entire section is the relative time the gas will be available to purchase.

That is four more years as far as Continental is concerned, and if they afford us proper facilities, they could probably have it longer.

The difference in the prices paid and the facilities afforded have no relationship to each other.

The statute says you have got to furnish substantially equal facilities, and you have got to pay substantially equal prices, and that reasonable differences in prices paid or reasonable differences in facilities afforded would be permitted, and that is only natural.

Now, when we consider the enforcement of the Common Purchaser Act, we do have to consider correlative rights, because the purpose of the Common Purchaser Act, and the

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Commission--and I won't burden you with reading all of the provisions of the gas proration statutes with which you are thoroughly familiar. I will only say that the Commission well knows correlative rights mean the opportunity afforded to the owner of each property in a pool to produce without waste his just and equitable share of the oil and gas in that pool.

That is what we are asking for.

I think it is highly significant that that statute was adopted in 1935, and the Legislature in its wisdom seemed to feel that it was deficient, so in 1949 it adopted that portion of the Common Purchaser Act applying to gas transportation facilities.

Now, when we get into this question as to whether the Commission's proration formula protects our correlative rights, as Southern Union contends, and gives us our opportunity to produce our just and equitable share, we will be forced to agree with him, if all of the wells were proratable wells, but as we pointed out in our opening statement, and as we pointed out throughout our testimony, the very fact that the pipeline company, by manipulation of its pressures for whatever purpose it may be done, can change a well from marginal status to non-marginal and change a non-marginal well back to a marginal status certainly indicates that the Commission must consider the facilities afforded if its proration orders are to serve the purpose and function for which they were designed.

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Now, we contend that the proration formula in the past has not afforded Continental Oil Company the opportunity to produce its just and equitable share of gas underlying its lands in this pool.

I think this is amply demonstrated by the fact that Southern Union when it reduced its line pressures changed the status of twelve of our wells from marginal to non-marginal, which fact has not yet been recognized in the Commission schedule, I admit, but on the basis of production properly should, they should be classified now as non-marginal because they have shown an ability to produce the proratable allowable, or we contend, and I think our evidence shows, that if we are afforded substantially the same pressures that are afforded other operators in the pool, including Caulkins Oil Company and Southern Union Production Company, we will be able to produce substantially more gas, which is our just and equitable share under the Commission formula, because when those wells become proratable wells the operation of the formula does give us our share of the gas.

This is, unfortunately, one of the deficiencies in our proration system which we just must recognize. A marginal well in the past has been operated at the will of the pipeline company and the operator has had no remedy other than to come to the Commission, as we have done here.

Now, I think a little quotation from our friend Ben Hall in

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this regard might be appropo, in an address he made at the Southwestern Legal Foundation in their Fourth Annual Institute.

Mr. Hall pointed out that either purchasers under natural gas contracts have succeeded by and large in satisfying the producers or the producers have not objected to the drainage of gas reservoirs, for there are few cases on the subject of the ratable take of gas.

We are not satisfied. We feel we have been harmed, and we are here asking for relief at the proper forum, the one which can give us relief.

One other point here. That Southern Union's position has been that there is a fair relationship between the pressures afforded us and the price paid for gas.

Very well. When we started looking at this situation in 1968, the pressures in this north segment already were 322 pounds, and in the Continental lease down here they were 490 pounds on the L, M, N, 0 leases over here they ran from 474 to 511 pounds.

In 1969 we had pressures to 287 pounds at this point.

Down here we had 470 pounds, and over here, 485 to 498 on the L, M, N, 0 leases.

Now, in 1970, just prior to the reduction in the line pressures which was made by Southern Union Gas Company, and while perhaps our complaints didn't cause them to put in these facilities, certainly we had been complaining, and we get reduced line pressures.

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The pressures on the Caulkins area, the Lowerie line, I am talking about the wellhead pressures, were up to 459 pounds.

Down here we were--I mean--no, I am sorry, 267 pounds on the leases here.

They were on the order of 459 pounds, and over here they ran from 457 to 494.

Our present most recent data, which I think is substantiated by all of the evidence here, the present pressures up here are on the order of 189 pounds.

Over here we have 250 pounds, and down here 285 pounds, so in spite of the fact that there have been reductions in line pressures, there still is a substantial pressure differential, depending on which well you may look at, from 60 to 50 pounds between the facilities afforded here on the northern segment and the facilities afforded here on the mid-portion of the eastern segment.

By no stretch of the imagination can those be said to be related to point to 5¢ per Mcf, which is what we are getting in addition over and above the 13¢ that Caulkins Oil Company is getting.

We would gladly trade our .25 cents for the same line pressures, because we would make that, make that up in additional production, as Mr. Mattes' testimony has shown.

Now, basically what we are talking about here is summed up by Summers on his oil and gas treatise, section 77--54, commenting

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on the Common Purchaser Act, Summers has this to say:

If all of our producers in a common source of supply have equal opportunity to sell or to transport oil and gas from their wells and they are not afforded the opportunity to produce their just and equitable share of the oil or gas or to utilize their just and equitable of the reservoir energy, viewed in this light, there is no doubt of the constitutionality of the Common Purchaser Act.

All we are asking for, really, is our opportunity to produce our just and equitable share, which we contend has been denied to us by the high line pressures maintained by Southern Union Gas Company.

Now, we are not asking for ratable take for Continental Oil Company. What we are asking for is ratable take from the South Blanco-Pictured Cliffs base pool that affects every operator in the Pool, all of whom we feel should have an equal opportunity to produce his gas, and we are fighting the battle as much for Aztec and Southern Union Production, or any other of the other operators. If they see fit because of their corporate relationship not to come in and ask for it, this is their business.

We feel we have been penalized and we are asking for it.

When you come to the question of how can the Commission do this, as has been pointed out, the Commission can't require a pipeline company---and I'd say by the same token--a producer to spend money.

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I will agree with that. We are not asking Southern Union Gas Company to take any specific action in the way of buying new compressors or facilities or putting in more pipes, or anything else.

What we are asking them to do is furnish us with substantially the same pressures as they are affording to Caulkins Oil Company or to any of the other operators in the Pool.

Now, those pressures may be higher or lower, and I certainly would be happy to sell them lower, because we will produce more gas, but if they raise the pressures on the other wells to the same pressures we have under the Common Purchaser Act, we have no grounds for complaint. This they can do without buying any more equipment.

We prefer to see them install more equipment or operate with the present equipment they have in such a fashion that these pressures can be equal.

We feel it can be done. We don't ask the Commission to tell Southern Union what to do. All we do ask the Commission to do is tell Southern Union Gas Company what results you expect them to achieve, which we feel should be substantially equal pressures throughout this system.

Now, in entering such an order, we, of course, have to recognize that pressures are not going to be equal. The laws of physics are not going to permit that, but we feel that present pressures go far beyond any differences which should be observed

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under the normal operation of a company conscientiously trying to equalize pressures in their system.

We would further propose that if the Commission sees fit to enter such an order, they hold the case open for an examination of the results achieved at some reasonable future date. I think this would be only proper both for Southern Union Gas Company and for Conoco Oil Company and the other operators.

In that connection, I would ask permission to file in the near future with the Commission a proposed form of order, and of course, we will furnish a copy to Southern Union Gas Company.

Thank you very much.

MR. PORTER: Does anyone else have a statement to make?

As to the request for permission to file the proposed order, why the Commission will allow the Applicant to submit a proposed order.

Do you have any comment, Mr. Morris?

MR. MORRIS: Well.

ME. PORTER: He indicated a copy of the order would be submitted to Southern Union.

MR. MORRIS: In this event, Mr. Porter, we would, of course, like to have the opportunity to respond by commenting on the proposed order to the Commission, and of course, the proposed order that Southern Union would present would at least be very brief as to the ordering portion of the order.

However, I think it would be appropriate for us to submit

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our own proposed order to contain the findings of fact that we would propose the Commission to make, so in that light we would make the same request that we have some period of time, at least two weeks, to submit a proposed order.

MR. KELLAHIN: If the Commission please, may I ask a question? You say time to respond. You mean by submitting a proposed order of your own?

MR. MORRIS: Well, I think that would be sufficient, Mr. Porter.

MR. PORTER: Well, suppose the Commission would allow each party here to submit a proposed order within fifteen days. Is that sufficient time?

MR. KELLAHIN: Fine.

MR. PORTER: In the case there has been some reference made here to a whipping boy, so I guess the Commission should give some consideration as to who is the whipper and who is the whippee, and so we will take the case under advisement and the hearing is adjourned.

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STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

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

CERTIFIED SHORTHAND REPORTER

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OWEN M. LOPEZ

February 9, 1972

New Mexico Oil Conservation Commission
State Land Office Building
Santa Fe, New Mexico 87501

Re: Case No. 4628, Application of Continental Oil Company, Rio Arriba County, New Mexico

Gentlemen:

In accordance with the Commission's ruling at the close of the hearing on the subject application, we submit herewith on behalf of Southern Union Gas Company a form of order which we propose that the Commission issue in this case.

Very truly yours,

Richard S. Morris

RSM:F
Encl.

cc &
Encl: Mr. Jason W. Kellahin
Attorney at Law
P.O. Box 1769
Santa Fe, N.M. 87501

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Southern Union Gas Company
Fidelity Union Tower
Dallas, Texas 75201

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Gas Supply
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Dallas, Texas 75201

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SANTA FE

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CONSERVATION COMM.

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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. 4628
Order No. R-

APPLICATION OF CONTINENTAL
OIL COMPANY FOR AN ORDER TO
ENSURE RATABLE TAKING OF GAS
AND AN EXCEPTION TO ORDER
NO. R-1670 RIO ARRIBA COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing before the Commission at 9:00 a.m. on January 26, 1972, at Santa Fe, New Mexico.

NOW, on this _____ day of February, 1972, the Commission, a quorum being present, having considered the evidence presented at the hearing 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) Southern Union Gas Company owns and operates a gas gathering system in the South Blanco-Pictured Cliffs Gas Pool, Rio Arriba County, New Mexico, to which system one hundred eighteen (118) gas wells in said pool are connected including thirty-one wells owned and operated by Continental Oil Company.

(3) Continental Oil Company complains that its wells connected to the Southern Union Gas Company gas gathering system in the South Blanco-Pictured Cliffs Gas Pool have been unreasonably discriminated against by reason of higher operating line pressures for Continental wells compared to other wells in the same pool that are connected to the Southern Union system.

(4) In October, 1971, Southern Union Gas Company installed and placed into operation 5-1/2 miles of 12-inch loop line on the trunk of its gathering system that serves Continental's wells and a substantial addition to its compressor facilities which serve Southern Union's gas

gathering system in the South Blanco-Pictured Cliffs Gas Pool, including that portion of the system to which Continental's wells are connected, with the result that the differential in line pressure between the Continental wells and other wells in the same pool and system, as well as operating line pressures in the entire system, has been substantially reduced.

(5) Further equalization in pressure between that portion of Southern Union's system serving Continental's wells and other portions of its system serving the wells of other operators cannot be achieved by modification of flow of gas through Southern Union's compressor facilities presently in service or by any other means that would not entail a substantial monetary expenditure by Southern Union.

(6) Southern Union Gas Company is purchasing and taking delivery of gas from the said Continental wells pursuant to that certain Natural Gas Purchase Contract dated January 1, 1956, between Southern Union and Continental's predecessor in interest, Humble Oil & Refining Company, which Contract may be terminated by either Southern Union or Continental on December 31, 1975; Southern Union is purchasing and taking delivery of gas from most of the other wells in the said pool pursuant to agreements which are coextensive with the term of the lease under which said wells were drilled.

(7) The gathering line pressure being maintained by Southern Union Gas Company in its gathering facilities connected to the Continental wells is not in excess of the maximum that is authorized by terms and provisions of the aforesaid Natural Gas Purchase Contract covering the sale of gas from Continental to Southern Union.

(8) The differences in the gas transportation facilities afforded by Southern Union Gas Company to Continental Oil Company and to other producers in the South Blanco-Pictured Cliffs Gas Pool are reasonable differences and bear a fair relationship to the differences in the relative lengths of time that Continental is committed to make gas from its wells available to Southern Union compared to the commitment of other producers.

(9) The prices paid by Southern Union for gas from the South Blanco-Pictured Cliffs Gas Pool differ in relation to its contractual commitments with regard to operating line pressures, and for this reason Continental receives a higher price for its gas than is received by other producers who enjoy a relatively lower line pressure. The differences in line pressure between Continental wells and other wells connected to the Southern Union Gas transportation facilities in the South Blanco-Pictured Cliffs Gas Pool are reasonable and bear a fair relationship to differences in the price paid by Southern Union for gas from the said Pool.

(10) The wells owned by Continental Oil Company in the South Blanco-Pictured Cliffs Gas Pool are producing from a portion of the formation having generally less sand

thickness and development than the wells of other producers which are connected to the Southern Union system. Accordingly, the differences in the gas transportation facilities afforded by Southern Union to Continental in comparison with other producers are reasonable in relation to the quantities of gas that are available to Southern Union from the respective properties.

(11) The purchases of gas made by Southern Union Gas Company through its gas gathering system in the South Blanco-Pictured Cliffs Gas Pool are being made without unreasonable discrimination in favor of one producer against another in the price paid, the quantities purchased, the bases of measurement or the gas transportation facilities afforded for gas of like quantity, quality and pressure available from gas wells in the said pool which are connected to the Southern Union Gas transportation facilities.

(12) Southern Union Gas Company has not failed to take gas from the Continental wells in the South Blanco-Pictured Cliffs Gas Pool ratably with its takings of gas from the wells of other producers in that pool that are connected to Southern Union Gas Company's gathering system.

(13) The evidence fails to establish that gas purchased from the Continental wells could be economically and satisfactorily used by Southern Union Gas Company by means of its gas transportation facilities now in service when purchased at any lesser delivery pressure than that now being maintained in Southern Union Gas Company gathering lines connected to the wells.

(14) The application of Continental Oil Company should be denied.

IT IS THEREFORE ORDERED:

(1) That the application of Continental Oil Company in this cause is hereby denied.

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

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

BRUCE KING, Chairman

ALEX J. ARMIJO, Member

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

SEAL

KELLAHIN AND FOX
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JASON W. KELLAHIN
ROBERT E. FOX

TELEPHONE 982-4315
AREA CODE 505

October 14, 1971

Case 4628

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OIL CONSERVATION COMM.
SANTA FE

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

Gentlemen:

Enclosed is the application of Continental Oil Company for an order or orders designed to insure ratable takes of gas in the South Blanco-Pictured Cliffs Gas Pool, Rio Arriba County, New Mexico.

You will note that this application, as provided by law, requests a hearing before the Oil Conservation Commission, rather than an examiner hearing. It is believed that because of the nature of the application, a hearing de novo before the Commission would be inevitable, and we believe that having it heard by the Commission in the first instance will save both time and expense for the Commission.

If possible, we would request a hearing on this case during the month of November.

Yours very truly,

Jason W. Kellahin

Jason W. Kellahin

JWK/sr
Encl. as stated

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Date

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OIL CONSERVATION COMM.
SANTA FE

BEFORE THE OIL CONSERVATION COMMISSION

OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF CONTINENTAL OIL COMPANY FOR AN ORDER OR ORDERS TO ENSURE RATABLE TAKING OF GAS AND AN EXCEPTION TO ORDER NO. R-1670, RIO ARRIBA COUNTY, NEW MEXICO.

CASE NO. 4628

ORDER NO. R-_____

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 A. M., January 26, 1972, and on January 27, 1972, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico.

NOW, on this _____ day of _____, 1972, the Commission, a quorum being present, having considered the testimony and the record, and being fully advised in the premises,

FINDS:

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

(2) That the applicant, Continental Oil Company, is the operator of the AXI Apache Leases, located in Township 25 North, Ranges 4 and 5 West, N.M.P.M., Rio Arriba County, New Mexico, under leases from the Apache Indian Tribe, and has wells completed in and producing from the South Blanco-Pictured Cliffs Gas Pool.

(3) That applicant's wells, located on said leases, are connected to and gas is sold through a gas pipeline operated by Southern Union Gas Company.

(4) That Southern Union Gas Company's pipeline system is connected to, and the Company takes gas from other operators producing gas from the South Blanco-Pictured Cliffs Gas Pool.

(5) That the South Blanco-Pictured Cliffs Gas Pool is a separate common source of supply of gas, as defined by the Commission, and its production is prorated pursuant to the provisions of Commission Order No. R-1670, as amended.

(6) That under the provisions of Section 65-3-15, New Mexico Statutes, Annotated, 1953 Compilation, as amended, Southern Union Gas Company is a common purchaser of gas in the South Blanco-Pictured Cliffs Gas Pool, subject to the provisions of said Section 65-3-15, N.M.S.A., and to the provisions of Rule 902 (b) of the Commission's Rules and Regulations.

(7) That applicant seeks the promulgation of the necessary order or orders that will ensure the ratable taking of gas by Southern Union Gas Company from gas wells in the South Blanco-Pictured Cliffs Gas Pool, Rio Arriba County, New Mexico, as required by law, and by the Commission's Rules and Regulations.

(8) Applicant further seeks, as an exception to the provisions of Order No. R-1670, as amended, the reclassification of its wells in the South Blanco-Pictured Cliffs Pool from marginal to non-marginal status, together with authority to carry underproduction for said wells forward from balancing period to balancing period without cancellation, as long as the wells remain classified as non-marginal and as long as such wells are denied facilities that are substantially the same as those afforded other South Blanco-Pictured Cliffs wells connected to Southern Union Gas Company's system.

(9) That under the provisions of said statutes, and Rule 902 (b), a common purchaser is required to purchase without unreasonable discrimination in favor of one producer against another in the price paid, the quantities purchased, the bases of measurement of the gas, or the gas transportation facilities afforded for gas of like quantity, quality and pressure available from such wells. Said statute further requires that a common purchaser taking gas produced from gas wells from a common source of supply shall take ratably under such rules, regulations and orders, concerning quantity, as may be promulgated by the Commission consistent with the act.

(10) It is the duty of the Commission to enforce the provisions of this act, and it is vested with the power, after notice and hearing, to make rules, regulations and orders for that purpose.

(11) That under the provisions of Order No. R-1670, production from the South Blanco-Pictured Cliffs Gas Pool is prorated in order to give each operator in the pool the opportunity, insofar as practicable, to produce his fair share of the gas underlying his tract.

(12) That under the provisions of Order No. R-1670, Rule 16 (b), the Secretary - Director of the Commission may reclassify a marginal or non-marginal well at any time the well's production data, deliverability data, or other evidence as to the well's producing ability justifies such reclassification.

(13) That Southern Union Gas Company operates a pipeline gathering system, extending across some ten townships, with compressor facilities located down-stream from applicant's wells.

(14) The average line pressures against which applicant's wells produced during the year 1970 was 468 psi. The average line pressures against which other producers in the South Blanco-Pictured Cliffs Gas Pool, connected to the same gathering system produced during 1970 ranged from 262 psi to 267 psi. During the first nine months of 1971, pressures against which applicant produced approximated 360 psi. The pressures against which other operators in the same pool, connected to the same gathering system has produced during the first nine months of 1971 has averaged 220 psi. At the present time applicant is producing against pressures ranging up to 60 psi higher than the pressures available

to other producers from the same pool, in the same pipeline system.

(15) Because of the differential in line pressures in the Southern Union Gas Company system connected to wells in the South Blanco-Pictured Cliffs pool, production from applicant's wells has been restricted, as compared to production from other wells in the pool, with the result that applicant's wells have been classified as marginal.

(16) Tests performed by applicant show that its wells are capable of producing in excess of the non-marginal allowable assigned to wells in the South Blanco-Pictured Cliffs Pool, when producing against line pressures comparable to pressures against which other wells connected to the same system have produced and are producing. During November 1971, against line pressures about 60 psi higher than the line pressures available to other producers from the same pool in this system, 12 of applicant's wells produced gas in excess of the non-marginal allowable assigned wells in the pool. The majority of these wells were still producing at non-marginal rates in early January, 1972.

(17) The differences in line pressures in the system, and the differences in production in the same common source of supply has resulted in non-ratable taking of gas in the South Blanco-Pictured Cliffs Pool, contrary to law and the rules and regulations of this Commission.

(18) Because of the pressures against which applicant's wells have been forced to produce, as compared to pressures against which other producers in the same pool, connected to the same gathering system have produced, applicant has been discriminated against in the production of gas from the pool and its correlative rights are not being protected, as required by law.

(19) Under the provisions of the New Mexico Common Purchaser Act, Sec. 65-3-15 (d), New Mexico Statutes Annotated, 1953 Compilation, differences in the gas transportation facilities afforded to different producers in a common source of supply cannot be related to the price paid for the gas produced.

(20) Applicant's gas has been connected to Southern Union Gas Company's system since 1956, and will, under its present contract, be available to Southern Union until December 31, 1975.

(21) Southern Union Gas Company has failed to purchase without unreasonable discrimination in favor of one producer as against another in the quantities purchased and the transportation facilities afforded for gas of like quantity, quality and pressure from wells in the pool, and such differences in quantities produced and purchased, and facilities afforded bear no fair relationship to differences in quality, quantity or pressure of the gas available to or the relative lengths of time during which such gas will be available to the purchaser. The quantity of gas available to the purchaser is determined by the annual gas well deliverability test which is used by the Commission in Rio Arriba County as an index to determine each well's ability to produce at assumed static wellhead working pressures as compared to other wells in the pool under like conditions.

(22) The manner in which Southern Union Gas Company has operated its pipeline facilities prevents the proration orders of the Oil Conservation Commission from operating to protect the correlative rights of the applicant.

(23) Unless all of the producers in a common source of supply have an equal opportunity to sell or to transport gas from their wells, they are not afforded the opportunity to produce their just and equitable share of the gas or to utilize their just and equitable share of the reservoir energy, as required by law.

(24) Non-ratable taking of gas from a common source of supply defeats the purpose of and is contrary to the provisions of the laws of New Mexico, the Rules and Regulations of this Commission, and orders entered pursuant thereto prorating gas production in the pool, places control of the prorationing system in the hands of the pipeline company, will result in premature abandonment of gas wells in the pool, discourage the drilling of additional wells and the development of additional gas reserves, and will result in the waste this Commission is directed by law to prevent.

(25) Southern Union Gas Company should be required to take ratably in the South Blanco-Pictured Cliffs Pool. To that end it should be directed to install and/or operate such equipment, pipelines, or take such other action and install such equipment as may be proper to provide substantially equal line pressures throughout its system in the South Blanco-Pictured Cliffs Pool.

(26) To assure compliance with this order, Southern Union Gas Company should be required to submit at regular intervals, a report of the pipeline pressures at such points as may from time to time be designated by the Commission, such reports to be filed with the Oil Conservation Commission, and copies thereof to be furnished to all producers connected to the Southern Union Gas Company system in the South Blanco-Pictured Cliffs gas gathering facilities.

(27) That applicant's wells on its AXI Apache Leases, South Blanco-Pictured Cliffs Pool, listed on Exhibit "A" attached to this order, should be reclassified as non-marginal wells, and that an allowable be assigned to such wells, with any underproduction of allowable to be carried forward without cancellation as long as said wells remain classified as non-marginal and as long as such wells are denied facilities that are substantially the same as those afforded other South Blanco-Pictured Cliffs wells connected to Southern Union Gas Company's system.

IT IS THEREFORE ORDERED:

(1) That Southern Union Gas Company be, and it hereby is ordered to take gas ratably from the wells to which it is connected in the South Blanco-Pictured Cliffs Pool.

(2) To achieve such ratable takes of gas from the South Blanco-Pictured Cliffs Pool, Southern Union Gas Company is ordered to so operate its pipelines and equipment, or to take such other action as may be necessary, or to install such equipment as it may elect, to provide substantially equal line pressures throughout its system and gathering facilities in said pool.

(3) Southern Union Gas Company is directed to file each month with the Commission, a report on the line pressures existing at such points within its system as the Secretary-Director of the Commission may from time to time direct, furnishing a copy of such report to all producers connected to its gas gathering system in the South Blanco-Pictured Cliffs Pool.

(4) Continental Oil Company's AXI Apache Lease wells, listed on Exhibit "A" attached hereto and made a part hereof for all purposes are hereby reclassified from marginal to non-marginal status, to remain so classified until their status is changed by order of the Secretary-Director of the Commission after notice to the producer.

(5) Any underproduction of allowable from said wells shall be carried forward without cancellation as long as the above wells remain classified as non-marginal and as long as such wells are denied facilities that are substantially the same as those afforded other South Blanco-Pictured Cliffs wells connected to Southern Union Gas Company's system.

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

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

BRUCE KING, Chairman

ALEX J. ARMIJO, Member

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

E X H I B I T "A"

Case No. 4628
Order No. R-_____

AXI Apache J, Well No. 1	D	5	25N	5 W
AXI Apache J, Well No. 2	P	5	25N	5 W
AXI Apache J, Well No. 3	E	6	25N	5 W
AXI Apache J, Well No. 5	D	7	25N	5 W
AXI Apache J, Well No. 6	P	8	25N	5 W
AXI Apache J, Well No. 7	D	8	25N	5 W
AXI Apache J, Well No. 8	P	5	25N	6 W
AXI Apache J, Well No. 10	A	6	25N	6 W
AXI Apache J, Well No. 11	A	5	25N	5 W
AXI Apache J, Well No. 12	K	4	26N	5 W
AXI Apache K, Well No. 2	B	9	26N	5 W
AXI Apache K, Well No. 3	A	3	26N	5 W
AXI Apache K, Well No. 4	M	10	26N	5 W
AXI Apache K, Well No. 5	H	36	25	4
AXI Apache L, Well No. 1	M	36	25	4
AXI Apache L, Well No. 2	A	35	25	4
AXI Apache L, Well No. 3	M	26	25	4
AXI Apache L, Well No. 4	A	26	25	4
AXI Apache L, Well No. 5	A	25	25	4
AXI Apache L, Well No. 6	M	23	25	4
AXI Apache M, Well No. 1	A	13	25	4
AXI Apache M, Well No. 3	I	24	25	4
AXI Apache M, Well No. 4	A	11	25	4
AXI Apache N, Well No. 1	A	12	25	4
AXI Apache N, Well No. 3	U	12	25	4
AXI Apache N, Well No. 4	M	1	25	4
AXI Apache N, Well No. 5	P	1	25	4
AXI Apache N, Well No. 6	M	12	25	4
AXI Apache N, Well No. 7	P	2	25	4
AXI Apache N, Well No. 8	A	10	26	4
AXI Apache O, Well No. 1				

BEFORE THE

OIL CONSERVATION COMMISSION OF NEW MEXICO

RECEIVED
OCT 18 1971
OIL CONSERVATION COMM.
SANTA FE

IN THE MATTER OF THE APPLICATION OF CONTINENTAL OIL COMPANY FOR AN ORDER INSURING RATABLE TAKES OF GAS PRODUCTION, SOUTH BLANCO PICTURED CLIFFS POOL, RIO ARRIBA COUNTY, NEW MEXICO.

Case 4628

A P P L I C A T I O N

Comes now Continental Oil Company and applies to the Oil Conservation Commission of New Mexico for an order or orders designed to insure ratable taking of gas in the South Blanco Pictured Cliffs Gas Pool, Rio Arriba County, New Mexico, and in support thereof would show the Commission:

1. Applicant is the operator of the AXI Apache Leases, located in Township 25 North, Ranges 4 and 5 West, N.M.P.M., Rio Arriba County, New Mexico, under leases from the Jicarilla Apache Indian Tribe.

2. Applicant's wells are connected to and gas is sold through a gas pipeline operated by Southern Union Gas Company.

3. Pipeline pressures, at the point at which applicant's wells are connected are substantially higher than the operating pressures for other wells connected to the same system and producing from the same common source of supply; likewise the operating pressures against which applicant's wells are forced to produce are considerably higher than operating pressures of the pipeline to which wells offsetting applicant's wells are connected. All of said wells are producing from the South Blanco Pictured Cliffs Gas Pool, as defined by the Commission.

4. Because of the pressure differential between the pressures against which applicant's wells must operate, and other wells in the same system, applicant has been discriminated against

in the production of gas from the same common source of supply, and applicant's correlative rights, as defined by law, are being impaired, contrary to the provisions of law and the rules and regulations of this Commission.

5. Because of the pressure differential between the pressures against which applicant's wells must operate, and the pressures against which other wells offsetting applicant's wells in the same common source of supply operate, applicant is being discriminated against in the production of gas, and its correlative rights are not being protected, as required by law.

6. The differences in the facilities provided by the pipeline company serving applicant bear no fair relationship to the differences in quality, quantity or pressure of the gas vailable or to the relative lengths of time during which such gas will be available to the purchaser, and constitute a violation of the provisions of Section 65-3-15, New Mexico Statutes, Annotated, 1953 Compilation, as amended, and Rule 902 (b) of the Commission's Rules and Regulations.

7. In accordance with said statutes, rules and regulations, the gas transmission facilities of gas purchaser should be installed, and operated in such a manner as to afford without unreasonable discrimination the ratable taking of gas from the wells in the South Blanco Pictured Cliffs Gas Pool connected thereto.

8. In accordance with the provisions of Commission Order No. R-1670, Rule 16 (B), applicant's wells should be immediately reclassified as non-marginal wells on the basis of the wells' deliverability data, well tests, and evidence as to the wells' ability to produce.

WHEREFORE Applicant prays that this matter be set for hearing before the Oil Conservation Commission of New Mexico at such date the Commission shall determine, and that after notice and hearing as required by law, the Commission enter

its order or orders designed to insure ratable takes of gas by Southern Union Gas Company in the South Blanco-Pictured Cliffs Pool, Rio Arriba County, New Mexico, and to insure that the correlative rights of the applicant will be protected; that applicant's wells be reclassified as non-marginal wells, and for such other and further orders as may be proper in the premises.

Respectfully submitted,

CONTINENTAL OIL COMPANY

E. M. ROBISON
Continental Oil Company
P. O. Box 2197
Houston, Texas 77001

JASON W. KELLAHIN
Kellahin & Fox
P. O. Box 1769
Santa Fe, New Mexico 87501

By Jason W. Kellahin

ATTORNEYS FOR APPLICANT

OIL CONSERVATION COMMISSION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

November 16, 1971

COPY

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

DOCKET MAILED
Date 11-16-71

Dear Mr. Kellahin:

This is official notice that Case No. 4628, an application by Continental Oil Company, which was set for 9 o'clock a.m. Tuesday, November 23, 1971, for Morgan Hall in the State Land Office building in Santa Fe, New Mexico, has been continued to 9 o'clock a.m. January 26, 1972. The hearing will be held in Morgan Hall.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

cc: Governor Bruce King
Land Commissioner Alex J. Armijo
Mr. Bob Manning, El Paso Natural Gas Company, El Paso
Mr. Richard S. Morris, Attorney at Law, Santa Fe, N.M.

KELLAHIN AND FOX
ATTORNEYS AT LAW
64½ EAST SAN FRANCISCO STREET
POST OFFICE BOX 1769
SANTA FE, NEW MEXICO 87501

JASON W. KELLAHIN
ROBERT E. FOX

TELEPHONE 982-4315
AREA CODE 505

February 11, 1972

RECEIVED
FEB 11 1972
OIL CONSERVATION COMM.
SANTA FE

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

Gentlemen:

In accordance with the Commission's statement at the conclusion of Case No. 4628, we are enclosing a proposed form of order which we suggest be entered in the case.

Yours very truly,

Jason W. Kellahin

Jason W. Kellahin

JWK:abs

Enclosure: as stated

cc: Messrs. E. M. Mattes (w/encl.)
E. M. Robison "
Continental Oil Company

Mr. Richard S. Morris (w/encl.)
Montgomery, Federici, Andrews,
Hannahs & Morris

RECEIVED
JAN 1 1972
OIL CONSERVATION COMM.
SANTA FE

BEFORE THE OIL CONSERVATION COMMISSION

OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE APPLICATION OF CONTINENTAL OIL COMPANY FOR AN ORDER OR ORDERS TO ENSURE RATABLE TAKING OF GAS AND AN EXCEPTION TO ORDER NO. R-1670, RIO ARRIBA COUNTY, NEW MEXICO.

CASE NO. 4628

ORDER NO. R-_____

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 A. M., January 26, 1972, and on January 27, 1972, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico.

NOW, on this _____ day of _____, 1972, the Commission, a quorum being present, having considered the testimony and the record, and being fully advised in the premises,

FINDS:

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

(2) That the applicant, Continental Oil Company, is the operator of the AXI Apache Leases, located in Township 25 North, Ranges 4 and 5 West, N.M.P.M., Rio Arriba County, New Mexico, under leases from the Apache Indian Tribe, and has wells completed in and producing from the South Blanco-Pictured Cliffs Gas Pool.

(3) That applicant's wells, located on said leases, are connected to and gas is sold through a gas pipeline operated by Southern Union Gas Company.

(4) That Southern Union Gas Company's pipeline system is connected to, and the Company takes gas from other operators producing gas from the South Blanco-Pictured Cliffs Gas Pool.

(5) That the South Blanco-Pictured Cliffs Gas Pool is a separate common source of supply of gas, as defined by the Commission, and its production is prorated pursuant to the provisions of Commission Order No. R-1670, as amended.

(6) That under the provisions of Section 65-3-15, New Mexico Statutes, Annotated, 1953 Compilation, as amended, Southern Union Gas Company is a common purchaser of gas in the South Blanco-Pictured Cliffs Gas Pool, subject to the provisions of said Section 65-3-15, N.M.S.A., and to the provisions of Rule 902 (b) of the Commission's Rules and Regulations.

(7) That applicant seeks the promulgation of the necessary order or orders that will ensure the ratable taking of gas by Southern Union Gas Company from gas wells in the South Blanco-Pictured Cliffs Gas Pool, Rio Arriba County, New Mexico, as required by law, and by the Commission's Rules and Regulations.

(8) Applicant further seeks, as an exception to the provisions of Order No. R-1670, as amended, the reclassification of its wells in the South Blanco-Pictured Cliffs Pool from marginal to non-marginal status, together with authority to carry underproduction for said wells forward from balancing period to balancing period without cancellation, as long as the wells remain classified as non-marginal and as long as such wells are denied facilities that are substantially the same as those afforded other South Blanco-Pictured Cliffs wells connected to Southern Union Gas Company's system.

(9) That under the provisions of said statutes, and Rule 902 (b), a common purchaser is required to purchase without unreasonable discrimination in favor of one producer against another in the price paid, the quantities purchased, the bases of measurement of the gas, or the gas transportation facilities afforded for gas of like quantity, quality and pressure available from such wells. Said statute further requires that a common purchaser taking gas produced from gas wells from a common source of supply shall take ratably under such rules, regulations and orders, concerning quantity, as may be promulgated by the Commission consistent with the act.

(10) It is the duty of the Commission to enforce the provisions of this act, and it is vested with the power, after notice and hearing, to make rules, regulations and orders for that purpose.

(11) That under the provisions of Order No. R-1670, production from the South Blanco-Pictured Cliffs Gas Pool is prorated in order to give each operator in the pool the opportunity, insofar as practicable, to produce his fair share of the gas underlying his tract.

(12) That under the provisions of Order No. R-1670, Rule 16 (b), the Secretary - Director of the Commission may reclassify a marginal or non-marginal well at any time the well's production data, deliverability data, or other evidence as to the well's producing ability justifies such reclassification.

(13) That Southern Union Gas Company operates a pipeline gathering system, extending across some ten townships, with compressor facilities located down-stream from applicant's wells.

(14) The average line pressures against which applicant's wells produced during the year 1970 was 468 psi. The average line pressures against which other producers in the South Blanco-Pictured Cliffs Gas Pool, connected to the same gathering system produced during 1970 ranged from 262 psi to 267 psi. During the first nine months of 1971, pressures against which applicant produced approximated 360 psi. The pressures against which other operators in the same pool, connected to the same gathering system has produced during the first nine months of 1971 has averaged 220 psi. At the present time applicant is producing against pressures ranging up to 60 psi higher than the pressures available

to other producers from the same pool, in the same pipeline system.

(15) Because of the differential in line pressures in the Southern Union Gas Company system connected to wells in the South Blanco-Pictured Cliffs pool, production from applicant's wells has been restricted, as compared to production from other wells in the pool, with the result that applicant's wells have been classified as marginal.

(16) Tests performed by applicant show that its wells are capable of producing in excess of the non-marginal allowable assigned to wells in the South Blanco-Pictured Cliffs Pool, when producing against line pressures comparable to pressures against which other wells connected to the same system have produced and are producing. During November 1971, against line pressures about 60 psi higher than the line pressures available to other producers from the same pool in this system, 12 of applicant's wells produced gas in excess of the non-marginal allowable assigned wells in the pool. The majority of these wells were still producing at non-marginal rates in early January, 1972.

(17) The differences in line pressures in the system, and the differences in production in the same common source of supply has resulted in non-ratable taking of gas in the South Blanco-Pictured Cliffs Pool, contrary to law and the rules and regulations of this Commission.

(18) Because of the pressures against which applicant's wells have been forced to produce, as compared to pressures against which other producers in the same pool, connected to the same gathering system have produced, applicant has been discriminated against in the production of gas from the pool and its correlative rights are not being protected, as required by law.

(19) Under the provisions of the New Mexico Common Purchaser Act, Sec. 65-3-15 (d), New Mexico Statutes Annotated, 1953 Compilation, differences in the gas transportation facilities afforded to different producers in a common source of supply cannot be related to the price paid for the gas produced.

(20) Applicant's gas has been connected to Southern Union Gas Company's system since 1956, and will, under its present contract, be available to Southern Union until December 31, 1975.

(21) Southern Union Gas Company has failed to purchase without unreasonable discrimination in favor of one producer as against another in the quantities purchased and the transportation facilities afforded for gas of like quantity, quality and pressure from wells in the pool, and such differences in quantities produced and purchased, and facilities afforded bear no fair relationship to differences in quality, quantity or pressure of the gas available to or the relative lengths of time during which such gas will be available to the purchaser. The quantity of gas available to the purchaser is determined by the annual gas well deliverability test which is used by the Commission in Rio Arriba County as an index to determine each well's ability to produce at assumed static wellhead working pressures as compared to other wells in the pool under like conditions.

(22) The manner in which Southern Union Gas Company has operated its pipeline facilities prevents the proration orders of the Oil Conservation Commission from operating to protect the correlative rights of the applicant.

(23) Unless all of the producers in a common source of supply have an equal opportunity to sell or to transport gas from their wells, they are not afforded the opportunity to produce their just and equitable share of the gas or to utilize their just and equitable share of the reservoir energy, as required by law.

(24) Non-ratable taking of gas from a common source of supply defeats the purpose of and is contrary to the provisions of the laws of New Mexico, the Rules and Regulations of this Commission, and orders entered pursuant thereto prorating gas production in the pool, places control of the prorationing system in the hands of the pipeline company, will result in premature abandonment of gas wells in the pool, discourage the drilling of additional wells and the development of additional gas reserves, and will result in the waste this Commission is directed by law to prevent.

(25) Southern Union Gas Company should be required to take ratably in the South Blanco-Pictured Cliffs Pool. To that end it should be directed to install and/or operate such equipment, pipelines, or take such other action and install such equipment as may be proper to provide substantially equal line pressures throughout its system in the South Blanco-Pictured Cliffs Pool.

(26) To assure compliance with this order, Southern Union Gas Company should be required to submit at regular intervals, a report of the pipeline pressures at such points as may from time to time be designated by the Commission, such reports to be filed with the Oil Conservation Commission, and copies thereof to be furnished to all producers connected to the Southern Union Gas Company system in the South Blanco-Pictured Cliffs gas gathering facilities.

(27) That applicant's wells on its AXI Apache Leases, South Blanco-Pictured Cliffs Pool, listed on Exhibit "A" attached to this order, should be reclassified as non-marginal wells, and that an allowable be assigned to such wells, with any underproduction of allowable to be carried forward without cancellation as long as said wells remain classified as non-marginal and as long as such wells are denied facilities that are substantially the same as those afforded other South Blanco-Pictured Cliffs wells connected to Southern Union Gas Company's system.

IT IS THEREFORE ORDERED:

(1) That Southern Union Gas Company be, and it hereby is ordered to take gas ratably from the wells to which it is connected in the South Blanco-Pictured Cliffs Pool.

(2) To achieve such ratable takes of gas from the South Blanco-Pictured Cliffs Pool, Southern Union Gas Company is ordered to so operate its pipelines and equipment, or to take such other action as may be necessary, or to install such equipment as it may elect, to provide substantially equal line pressures throughout its system and gathering facilities in said pool.

(3) Southern Union Gas Company is directed to file each month with the Commission, a report on the line pressures existing at such points within its system as the Secretary-Director of the Commission may from time to time direct, furnishing a copy of such report to all producers connected to its gas gathering system in the South Blanco-Pictured Cliffs Pool.

(4) Continental Oil Company's AXI Apache Lease wells, listed on Exhibit "A" attached hereto and made a part hereof for all purposes are hereby reclassified from marginal to non-marginal status, to remain so classified until their status is changed by order of the Secretary-Director of the Commission after notice to the producer.

(5) Any underproduction of allowable from said wells shall be carried forward without cancellation as long as the above wells remain classified as non-marginal and as long as such wells are denied facilities that are substantially the same as those afforded other South Blanco-Pictured Cliffs wells connected to Southern Union Gas Company's system.

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

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

BRUCE KING, Chairman

ALEX J. ARMIJO, Member

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

E X H I B I T "A"

Case No. 4628
Order No. R-_____

AXI Apache J, Well No. 1
AXI Apache J, Well No. 2
AXI Apache J, Well No. 3
AXI Apache J, Well No. 5
AXI Apache J, Well No. 6
AXI Apache J, Well No. 7
AXI Apache J, Well No. 8
AXI Apache J, Well No. 10
AXI Apache J, Well No. 11
AXI Apache J, Well No. 12
AXI Apache K, Well No. 2
AXI Apache K, Well No. 3
AXI Apache K, Well No. 4
AXI Apache K, Well No. 5
AXI Apache L, Well No. 1
AXI Apache L, Well No. 2
AXI Apache L, Well No. 3
AXI Apache L, Well No. 4
AXI Apache L, Well No. 5
AXI Apache L, Well No. 6
AXI Apache M, Well No. 1
AXI Apache M, Well No. 3
AXI Apache M, Well No. 4
AXI Apache N, Well No. 1
AXI Apache N, Well No. 3
AXI Apache N, Well No. 4
AXI Apache N, Well No. 5
AXI Apache N, Well No. 6
AXI Apache N, Well No. 7
AXI Apache N, Well No. 8
AXI Apache O, Well No. 1

OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
1000 RIO BRAZOS ROAD - AZTEC
87410

GOVERNOR
BRUCE KING
CHAIRMAN

LAND COMMISSIONER
ALEX J. ARMIJO
MEMBER

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

April 12, 1972

Mr. A. L. Porter, Jr.
Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico

RECEIVED
APR 17 1972
OIL CONSERVATION COMM.
Santa Fe

Re: Proposed order - Case No. 4628

Dear Pete:

We received a copy of what we believe to be the proposed order resulting from Case No. 4628.

I would like to discuss some terminology of portions as identified below and based on a "first impression" of reading the order:

Finding (24) implies that gas will not be available to Southern Union after December 31, 1975.

The contract submitted by Southern Union as an exhibit does expire December 31, 1975. It also includes all productive zones. Southern Union will have an opportunity to negociate a new contract effective January 1, 1976.

Finding (33): I think this finding should specify a date for consideration of reclassification; maybe, at the beginning or end of a balancing period because reclassification occurs on the same day for all wells. The term "balancing period" now refers to a six-month period and may become a twelve-month period in the near future. Without further identity the reclassification date is not defined.

Our Reclassification dates have been February 1st and August 1st for several years. The January 1, 1971, may cause some problems in calculations.

Order (2): The date January 1, 1972, should agree with the date established in Finding (33).

Order (3): -- subject to reclassification on the specific date established in Finding (33).

Order (4) does not provide for underage to be carried forward on July 31, 1972, if for some reason the resultant order of Elvis' Case 4691 is not entered prior to that date. The existing rules in R-1670 set out a balancing date of July 31, 1972.

All I'm trying to do is get the order definite on points and dates so that you, we, Southern Union and Continental will arrive at the same conclusion when the order is read by each of us.

I realize there was no request for these remarks. If they are useful, fine; if not, each of you has a container by your desk which will accept them.

Yours very truly,

A. R. Kendrick
Engineer, District #3

ARK:mc

Docket No. 26-71

DOCKET: REGULAR HEARING - TUESDAY - NOVEMBER 23, 1971

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

CASE 4628: Application of Continental Oil Company for an order or orders to ensure ratable taking of gas and an exception to Order No. R-1670, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks the promulgation of the necessary order or orders that will ensure the ratable taking of gas by Southern Union Gas Company from gas wells in the South Blanco-Pictured Cliffs Pool, Rio Arriba County, New Mexico. Applicant further seeks as an exception to Order No. R-1670, the reclassification of certain of its wells in the South Blanco-Pictured Cliffs Pool from marginal to non-marginal status and authority to carry underproduction for said wells forward without cancellation as long as the wells remain classified non-marginal.

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. 4628
Order No. R-4293

APPLICATION OF CONTINENTAL OIL
COMPANY FOR AN ORDER OR ORDERS TO
ENSURE RATABLE TAKING OF GAS AND AN
EXCEPTION TO ORDER NO. R-1670, RIO
ARRIBA COUNTY, NEW MEXICO.

4-24-72

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m., January 26, 1972, and on January 27, 1972, at Santa Fe, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this_____day of _____, 1972, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

FINDS:

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

(2) That the applicant, Continental Oil Company, is the operator of the AXI Apache Leases, located in Township 25 North, Ranges 4 and 5 West, NMPM, Rio Arriba County, New Mexico, under leases from the Apache Indian Tribe, and has wells completed in and producing from the South Blanco-Pictured Cliffs Gas Pool.

(3) Southern Union Gas Company owns and operates a gas gathering system in the South Blanco-Pictured Cliffs ~~Gas~~ Pool, Rio Arriba County, New Mexico, to which system one hundred eighteen (118) gas wells in said pool are connected including thirty-one wells owned and operated by Continental Oil Company.

(4) That the South Blanco-Pictured Cliffs ~~Gas~~ Pool is a separate common source of supply of gas, as defined by the Commission, and its production is prorated pursuant to the provisions of Commission Order No. R-1670, as amended.

(5) That under the provisions of Section 65-3-15, New Mexico Statutes, Annotated, 1953 Compilation, as amended, Southern Union Gas Company is a common purchaser of gas in the South Blanco-Pictured Cliffs ~~Gas~~ Pool, subject to the provisions of said Section 65-3-15, NMSA, and to the provisions of Rule 902 ~~(b)~~ of the Commission's Rules and Regulations.

(6) That the applicant seeks the promulgation of the necessary order or orders that will ensure the ratable taking of gas by Southern Union Gas Company from gas wells in the South Blanco-Pictured Cliffs Pool, Rio Arriba County, New Mexico, as required by law, and by the Commission's Rules and Regulations.

(7) Applicant further seeks as an exception to the provisions of Order No. R-1670, as amended, the reclassification of certain of its wells from marginal to non-marginal status, together with authority to carry underproduction for said wells forward from balancing period to balancing period without cancellation as long as the wells remain classified non-marginal.

(8) That under the provisions of said statutes, and Rule 902~~(b)~~, a common purchaser is required to purchase without unreasonable discrimination in favor of one producer against another in the price paid, the quantities purchased, the bases of measurement of the gas, or the gas transportation facilities afforded for gas of like quantity, quality and pressure available from such wells. Said statute further requires that a common purchaser taking gas produced from gas wells from a common source of supply shall take ratably under such rules, regulations and orders, concerning quantity, as may be promulgated by the Commission consistent with the act.

(9) It is the duty of the Commission to enforce the provisions of this act, and it is vested with the power, after notice and hearing, to make rules, regulations and orders for that purpose.

(10) That under the provisions of Order No. R-1670, production from the South Blanco-Pictured Cliffs ~~Gas~~ Pool is prorated in order to give each operator in the pool the opportunity, insofar as practicable, to produce his fair share of the gas underlying his tract.

(11) That under the provisions of Order No. R-1670, Rule 16(b), the Secretary-Director of the Commission may reclassify a marginal or non-marginal well at any time the well's production data, deliverability data, or other evidence as to the well's producing ability justifies such reclassification.

(12) That Southern Union Gas Company's pipeline gathering system extends across some ten townships, with compressor facilities located down-stream from applicant's wells and the wells of other producers in the pool.

(13) That the compressor station for the gas gathering system is located in Section 4, Township 25 North, Range 6 West.

(14) That the Lowry section of the gathering system extends north from the compressor station to South Blanco-Pictured Cliffs wells located in Township 26 North, Ranges 6 and 7 West.

(15) That the Ballard section of the gathering system extends West and North from the compressor station to South Blanco-Pictured Cliffs wells located in Township 27 North, Range 8 West.

(16) That the Jicarilla section of the gathering system extends east from the compressor station to South Blanco-Pictured Cliffs wells located in Townships 25 and 26 North, Ranges 3, 4, and 5 West.

(17) That Continental's wells are connected to the Jicarilla section of the gathering system.

(18) That during the first nine months of 1971, monthly average pipeline pressures against which wells owned by Continental Oil Company had to produce ranged from 355 psi to 423 psi, while monthly average pipeline pressures against which wells connected to the Lowry section of Southern Union's gathering system had to produce ranged from 205 psi to 295 psi, thereby creating a pressure differential favoring said Lowry section averaging 143 psi.

(19) In October, 1971, Southern Union Gas Company installed and placed into operation approximately five miles of 12-inch loop line on the trunk of its Jicarilla section that serves Continental's wells and a substantial addition to its compressor facilities which serve Southern Union's gas gathering system in the South Blanco-Pictured Cliffs ~~Gas~~ Pool, including that portion of the system to which Continental's wells are connected.

(20) That during the eight-day period ending January 9, 1972, the daily average pipeline pressures against which wells owned by Continental Oil Company had to produce ranged from 210 psi to 337 psi while the daily average pipeline pressures against which wells connected to the Lowry section of Southern Union's gathering

system had to produce ranged from 165 psi to 249 psi, thereby creating a pressure differential favoring said Lowry section averaging 64 psi.

(21) That the differential in line pressure between the Jicarilla section and the Ballard and Lowry sections has been substantially reduced by installation of the loop line and additional compressor facilities.

(22) That the wells owned by Continental Oil Company in the South Blanco-Pictured Cliffs Pool are producing from a portion of the pool having generally less sand thickness and less sand development than the wells of producers connected to the Lowry section of the gathering system.

(23) That based upon said sand thickness and sand development, there is a greater quantity of gas available from wells connected to the Lowry section of the gathering system than from the Continental wells connected to the Jicarilla section of the gathering system.

(24) That gas produced by wells belonging to Continental Oil Company will be available to Southern Union Gas Company until December 31, 1975.

(25) That gas produced by practically all wells connected to the Lowry section will be available to Southern Union Gas Company until February 1, 1984 and for so long thereafter as gas is or can be produced from one or more subject wells.

(26) That gas will be available to Southern Union Gas Company from wells connected to the Ballard section as long as gas is or can be produced from a well or proration unit on any portion of such lands or as long as any of seller's leases or leasehold rights or any renewals or extensions thereof shall remain in force and effect.

(27) That gas will be available to Southern Union Gas Company from wells connected to the Ballard and Lowry sections for a relatively longer period of time than gas will be available from Continental's wells connected to the Jicarilla section.

(28) That considering the quantity of gas available and the relative length of time such gas will be available to Southern Union Gas Company, a difference of approximately 64 psig in line pressures between the Jicarilla section and the Ballard and Lowry sections of the gas gathering system does not constitute an unreasonable difference in transportation facilities afforded.

30 ~~(29)~~ That Southern Union Gas Company is taking gas ratably from the various gas producers connected to its system in the South Blanco-Pictured Cliffs Pool. ~~in accordance with a formula prepared by Southern Union Gas Company which takes into consideration allowables assigned by the Commission.~~

31 ~~(30)~~ That the applicant's request for the promulgation of the necessary order or orders that will ensure the ratable taking of gas by Southern Union Gas Company should be denied.

32 ~~(31)~~ That considering the quantity of gas available and the relative length of time such gas will be available to Southern Union Gas Company, a difference in line pressures substantially in excess of 64 psig existing between the Jicarilla Section and the Ballard and Lowry sections of the gas gathering system prior to installation of the loop line and additional compression facilities constituted an unreasonable difference in transportation facilities afforded.

33 ~~(32)~~ That wells belonging to Continental Oil Company and connected to the Jicarilla section of the system would have produced more gas during the period from January 1, 1971, to date of installation of the loop line and additional compressor facilities, but for the unreasonable difference in transportation facilities afforded.

34 ~~(33)~~ That in order to afford Continental Oil Company the opportunity to produce said additional gas, the wells belonging to Continental Oil Company connected to the Jicarilla section of the gas gathering system should be reclassified non-marginal and their statuses adjusted as of January 1, 1971, and should not be subject to reclassification and cancellation until the first balancing period beginning in 1973.

35 ~~(34)~~ That the applicant's request for authority to carry underproduction for said wells forward from balancing period to balancing period without cancellation as long as said wells remain classified non-marginal should be denied.

IT IS THEREFORE ORDERED:

(1) That the application of Continental Oil Company for the promulgation of the necessary order or orders to ensure the ratable taking of gas by Southern Union Gas Company is hereby denied.

(2) That effective as of January 1, 1972, the following-described wells belonging to Continental Oil Company in the South Blanco-Pictured Cliffs Pool, Rio Arriba County, New Mexico, are hereby reclassified non-marginal and the status of each adjusted accordingly:

Well Name	No.	Unit	Section	Township	Range
AXI Apache J	1	D	5	25N	5W
AXI Apache J	2	P	5	25N	5W
AXI Apache J	3	E	6	25N	5W
AXI Apache J	5	D	7	25N	5W
AXI Apache J	6	P	7	25N	5W
AXI Apache J	7	D	8	25N	5W
AXI Apache J	8	P	8	25N	5W
AXI Apache J	10	A	5	25N	5W
AXI Apache J	11	A	6	25N	5W
AXI Apache J	12	K	5	25N	5W
AXI Apache K	2	B	4	26N	5W
AXI Apache K	3	A	9	26N	5W
AXI Apache K	4	M	3	26N	5W
AXI Apache K	5	H	10	26N	5W
AXI Apache L	1	M	36	25N	4W
AXI Apache L	2	A	36	25N	4W
AXI Apache L	3	M	35	25N	4W
AXI Apache L	4	M	26	25N	4W
AXI Apache L	5	A	26	25N	4W
AXI Apache L	6	A	25	25N	4W
AXI Apache M	1	M	23	25N	4W
AXI Apache M	3	A	13	25N	4W
AXI Apache M	4	I	24	25N	4W
AXI Apache N	1	A	11	25N	4W
AXI Apache N	3	A	12	25N	4W
AXI Apache N	4	D	12	25N	4W
AXI Apache N	5	M	1	25N	4W
AXI Apache N	6	P	1	25N	4W
AXI Apache N	7	M	12	25N	4W
AXI Apache N	8	P	2	25N	4W
AXI Apache O	1	A	10	25N	4W

(under)

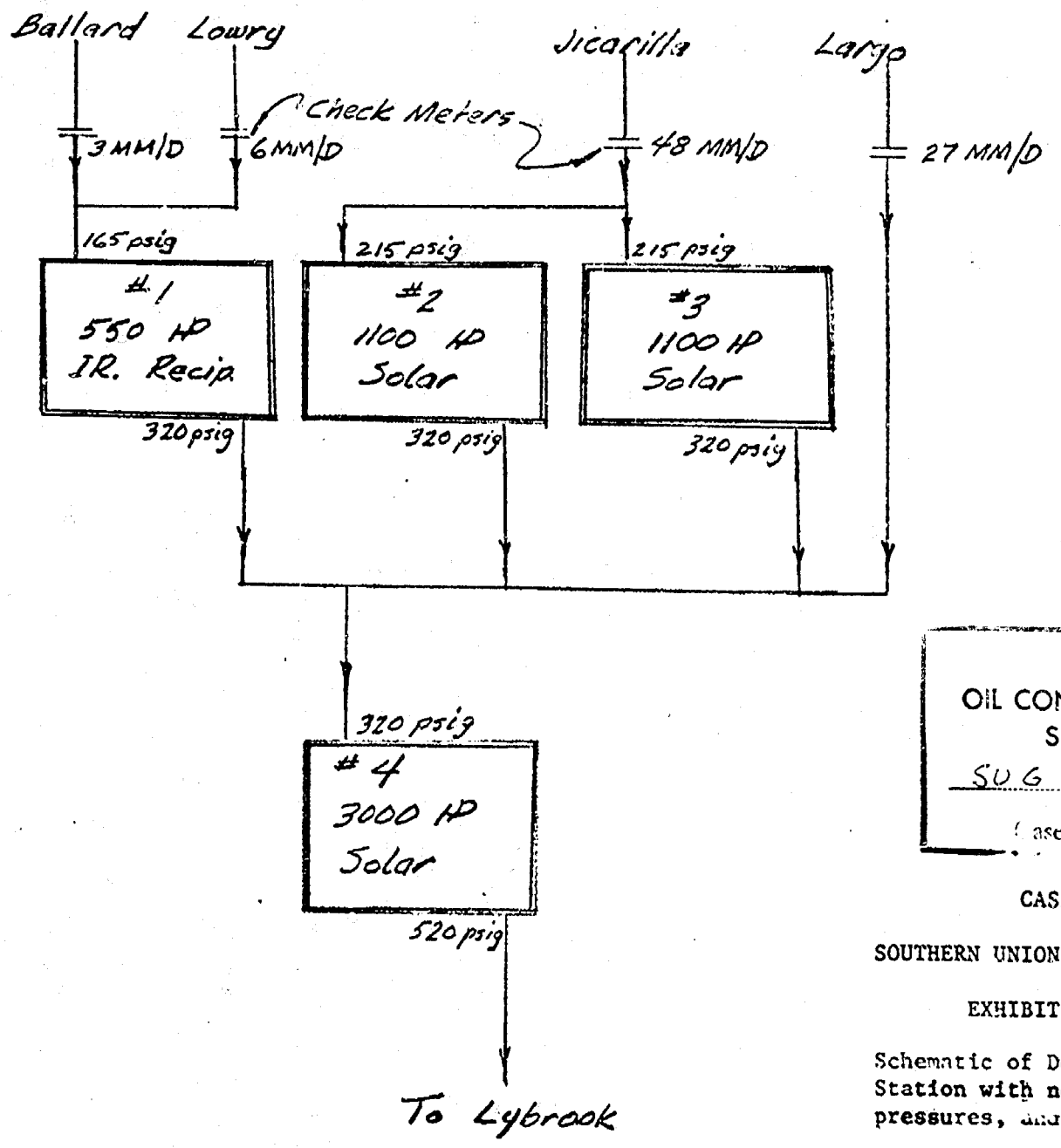
(3) That the wells described in Order (2), above, shall be subject to reclassification and cancellation at the first balancing period beginning in January, 1973.

(4) That the application of Continental Oil Company for authority to carry underproduction for the wells described in Order (2), above, forward from balancing period to balancing period without cancellation as long as said wells remain classified non-marginal is hereby denied.

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

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

Complete So. Union
Set of Ex's —
Case 4628



1-26-72

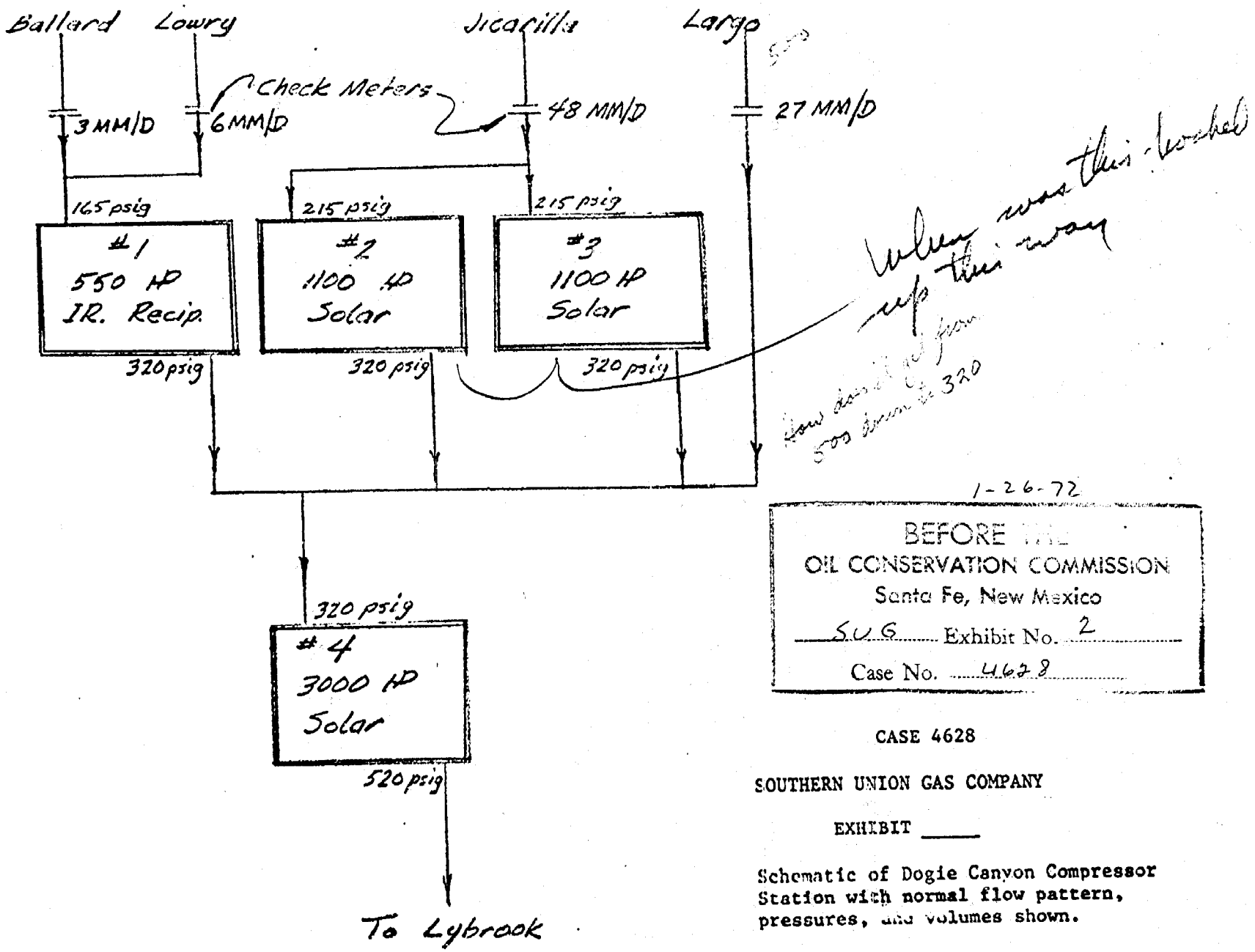
BEFORE ME
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
SUG Exhibit No. 2
Case No. 4628

CASE 4628

SOUTHERN UNION GAS COMPANY

EXHIBIT 2

Schematic of Dogie Canyon Compressor Station with normal flow pattern, pressures, and volumes shown.



When was this hooked up this way

How does it get from 500 down to 320

1-26-72

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
SUG Exhibit No. 2
Case No. 4628

CASE 4628

SOUTHERN UNION GAS COMPANY

EXHIBIT _____

Schematic of Dogie Canyon Compressor Station with normal flow pattern, pressures, and volumes shown.

1971 AVERAGE PRODUCING PRESSURE

CASE #4628
SOUTHERN UNION GAS COMPANY
EXHIBIT
AVERAGE PRODUCING PRESSURE
GAS COMPANY CONNECTIONS
SOUTH BLANCO PICTURED CLIFF POOL

			Sec	Twp	Range	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
AZTEC OIL & GAS CO																	
200305	ARIZ JICARILLA	0001	35	25	04	CHART CHANGING SUSPENDED 10-17-69											
200405	ARIZ JICARILLA	0002	26	25	04	361	364	367	364	377	380	416	418	395	350	289	275
200605	ARIZ JICARILLA	0004	36	25	04	355	358	367	355	393	377	415	418	395	350	267	275
200705	ARIZ JICARILLA	0005	25	25	04	381	355	357	355	367	373	418	425	409	353	275	275
200805	ARIZ JICARILLA	0006	36	25	04	-0-	367	394	370	405	389	416	425	415	356	295	286
200905	ARIZ JICARILLA	0007	26	25	04	364	364	359	370	380	386	416	418	395	353	294	283
201005	ARIZ JICARILLA	0008	25	25	04	361	361	358	355	367	386	421	402	412	356	273	270
201105	ARIZ JICARILLA	A0001	23	25	04	DISCONNECTED 10-10-71											
201205	ARIZ JICARILLA	A0002	24	25	04	CHART CHANGING SUSPENDED 11-26-68											
201305	ARIZ JICARILLA	A0003	13	25	04	364	361	367	367	392	402	425	431	418	380	300	291
256905	ARIZ JICARILLA	A0004	24	25	04	352	358	364	352	377	389	421	425	412	347	275	275
201505	ARIZ JICARILLA	B0001	04	26	05	425	428	460	445	438	441	476	462	458	389	394	361
201605	ARIZ JICARILLA	B0002	09	26	05	364	373	376	373	389	429	435	451	425	362	306	297
201705	ARIZ JICARILLA	B0003	10	26	05	377	386	393	396	405	420	441	470	465	418	329	305
ABRAHAM J R						(378)											
276505	CHARLES M	0001	07	25	03	349	352	331	355	373	389	411	421	399	353	275	280
277205	CHARLES M	0002	07	25	03	365	371	370	367	380	389	424	415	425	359	275	286
CAULKINS PRODUCING CO						(357)											
203005	BREECH	0221	13	26	07	208	232	227	303	253	215	217	282	260	215	196	210
203105	BREECH	0224	13	26	07	214	227	227	295	239	222	229	282	252	217	187	200
203505	BREECH	0283	13	26	07	217	227	227	319	239	229	227	295	266	214	205	200
203705	BREECH	0310	13	26	07	217	250	224	290	244	232	234	303	271	215	205	203
203805	BREECH	0312	18	26	06	219	232	222	301	242	224	227	280	251	210	196	205
203905	BREECH A	0125	08	26	06	224	222	253	307	247	226	256	277	271	215	191	203
204005	BREECH A	0127	08	26	06	215	212	227	304	242	219	229	280	266	212	187	200
204105	BREECH A	0129	09	26	06	224	237	234	307	247	217	229	-0-	-0-	-0-	-0-	250
204205	BREECH A	0131	09	26	06	198	205	207	323	242	219	229	283	258	215	182	187
204305	BREECH A	0133	10	26	06	193	222	215	293	234	216	232	283	261	210	185	193
204405	BREECH A	0135	10	26	06	189	203	203	287	242	222	232	274	264	212	185	183
204505	BREECH A	0177	09	26	06	239	198	201	281	237	229	224	277	264	208	182	182
204605	BREECH A	0179	09	26	06	198	200	200	287	232	222	234	277	267	208	176	176
204705	BREECH A	0181	10	26	06	200	207	205	285	293	219	222	289	258	203	178	191
204805	BREECH A	0183	10	26	06	210	215	219	293	242	234	270	285	261	207	-0-	205
278105	BREECH B	0123	07	26	06	224	217	227	304	240	236	242	312	269	212	196	212
205005	BREECH B	0220	14	26	07	210	239	242	311	274	239	227	247	266	207	191	210
205105	BREECH B	0281	14	26	07	212	229	222	300	247	-0-	-0-	-0-	-0-	-0-	-0-	-0-
205205	BREECH C	0241	14	26	06	207	215	205	296	239	213	229	296	269	215	187	180
205405	BREECH C	0299	14	26	06	193	198	242	276	227	210	-0-	-0-	239	216	-0-	185
205505	BREECH C	0301	14	26	06	197	212	228	295	234	216	229	292	271	212	180	187
205605	BREECH C	0328	13	26	06	205	210	234	290	242	259	219	280	273	207	196	201
205705	BREECH D	0185	11	26	06	205	227	224	290	249	237	239	297	263	212	196	203
203405	BREECH D	0237	15	26	06	189	198	210	302	234	217	224	283	266	214	185	172
205805	BREECH D	0239	15	26	06	203	210	210	299	244	226	227	294	299	219	191	189
205905	BREECH D	0345	22	26	06	196	207	210	285	225	219	224	279	271	222	191	191
206005	BREECH E	0049	05	26	06	205	215	217	298	237	216	224	303	264	212	185	196
206305	BREECH E	0081	05	26	06	210	215	220	301	239	216	227	311	263	212	178	191
206505	BREECH E	0083	05	26	06	208	223	217	298	237	212	220	274	258	212	180	194
206705	BREECH E	0085	04	26	06	203	215	215	320	242	249	227	288	269	210	191	187
206605	BREECH E	0087	04	26	06	203	227	227	307	244	217	224	274	270	212	187	189
234203	KAIME	0001	20	26	06	200	205	210	287	247	223	227	288	263	212	189	191
249005	REUTER	0297	15	26	06	189	238	201	259	230	219	-0-	287	271	205	178	176
249105	REUTER	0343	22	26	06	189	196	198	272	222	213	-0-	-0-	-0-	-0-	-0-	-0-
252105	STATE A	0295	16	26	06	189	198	203	285	234	212	217	286	268	205	176	172
252205	STATE B COM	0233	16	26	06	198	198	196	304	229	219	219	266	258	234	215	205
252505	STATE C COM	0235	16	26	06	193	200	200	287	227	219	222	284	258	205	182	178
CONTINENTAL OIL CO						(203)					(223)		(285)			6029	6797
230805	AXI APACHE J	0001	05	25	05	344	349	352	346	355	361	408	421	403	348	273	254
230905	AXI APACHE J	0002	05	25	05	349	349	355	358	365	361	411	408	408	327	259	252
231005	AXI APACHE J	0003	06	25	05	334	346	349	344	352	359	395	415	398	324	272	257
231105	AXI APACHE J	0005	07	25	05	334	346	352	350	355	365	395	415	403	330	259	244
231205	AXI APACHE J	0006	07	25	05	340	346	358	358	355	362	405	402	407	339	261	252
231305	AXI APACHE J	0007	08	25	05	337	362	362	349	355	365	405	412	407	333	257	244
231405	AXI APACHE J	0008	08	25	05	337	346	349	344	358	356	395	402	407	328	252	242
281305	AXI APACHE J	0010	05	25	05	352	358	377	355	370	374	415	419	412	341	270	267
281505	AXI APACHE J	0011	06	25	05	343	349	377	378	358	367	411	412	403	353	268	290
286305	AXI APACHE J	0012	05	25	05	340	352	361	358	361	361	411	415	412	342	262	254
231905	AXI APACHE K	0002	04	26	05	425	421	452	435	431	438	469	459	451	393	358	367
232005	AXI APACHE K	0003	09	26	05	370	383	392	390	398	395	461	451	445	377	320	297
282405	AXI APACHE K	0004	03	26	05	370	373	393	383	395	408	438	460	456	371	317	302

Nov Dec wtd Jan

wtd Carilkins + McDonald 198.1 193.9 192.7

Carilk 281.8 276.3 278.6

1-26-72

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
SU 6 Exhibit No. 3
Case No. 4628

1971 AVERAGE PRODUCING PRESSURE (CONTINUED)

CONTINENTIAL OIL CO (CONTINUED)

			Sec	Twp	Range	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
282605	AXI APACHE K	0005	10	26	05	367	370	389	355	392	402	441	461	446			
232105	AXI APACHE L	0001	36	25	04	361	358	363	374	386	394	424	448	407	356	298	273
232205	AXI APACHE L	0002	36	25	04	349	355	374	355	367	374	411	411	408	350	278	270
232305	AXI APACHE L	0003	35	25	04	367	367	373	373	399	386	428	429	439	374	303	291
232405	AXI APACHE L	0004	26	25	04	364	370	373	380	377	386	415	418	412	353	289	289
232505	AXI APACHE L	0005	26	25	04	355	355	380	361	370	389	424	428	425	359	278	280
232605	AXI APACHE L	0006	25	25	04	361	361	370	361	374	383	421	428	416	365	286	283
232705	AXI APACHE M	0001	23	25	04	358	364	371	367	380	386	424	424	420	350	275	283
232805	AXI APACHE M	0003	13	25	04	374	358	379	364	373	383	424	421	419	353	286	278
232905	AXI APACHE M	0004	24	25	04	349	358	367	380	377	419	420	425	412	359	281	268
233005	AXI APACHE N	0001	11	25	04	355	358	380	367	376	382	414	418	409	353	277	308
280005	AXI APACHE N	0003	12	25	04	349	358	364	358	370	378	411	411	405	347	270	272
280705	AXI APACHE N	0004	12	25	04	358	361	358	353	383	386	414	415	405	353	275	292
280805	AXI APACHE N	0005	01	25	04	349	352	364	367	370	380	415	408	405	347	273	272
282805	AXI APACHE N	0006	01	25	04	371	358	361	355	370	377	408	412	412	356	272	273
282905	AXI APACHE N	0007	12	25	04	340	352	374	364	386	383	418	418	392	375	286	278
283005	AXI APACHE N	0008	02	25	04	352	358	361	358	367	390	414	415	406	341	278	267
233105	AXI APACHE O	0001	10	25	04	358	355	364	355	374	383	407	415	433	366	277	283
																8736	8566
MACDONALD OIL CORP																	
250505	SCOTT A	0001	15	26	06	189	194	198	282	227	212	212	280	258	203	174	170
250605	SCOTT B	0001	05	26	06	215	227	222	307	239	217	227	286	267	217	189	200
250705	SCOTT C	0001	13	26	06	198	208	225	276	237	222	219	289	263	203	182	194
250805	SCOTT D	0001	14	26	07	210	230	227	298	244	227	217	308	274	222	198	200
																743	764
SOUTHERN UNION PRODUCTION CO																	
703505	JICARILLA F	0002	33	26	04	346	355	361	358	370	390	414	411	409	356	283	270
704005	JICARILLA H	0003	19	26	04	367	370	383	373	386	399	438	435	415	362	289	288
704105	JICARILLA H	0004	19	26	04	383	373	379	370	386	394	438	442	421	365	288	286
704205	JICARILLA J	0002	35	26	05	349	355	361	361	367	371	408	418	429	347	313	279
704305	JICARILLA J	0003	26	26	05	370	392	360	377	386	398	448	465	425	359	291	289
704405	JICARILLA J	0004	26	26	05	373	389	386	373	395	405	448	461	425	359	285	288
704505	JICARILLA J	0005	25	26	05	376	377	383	370	392	416	445	456	422	399	451	-0-
704605	JICARILLA J	0006	25	26	05	367	377	386	368	389	403	445	447	412	362	278	286
710605	JICARILLA J	0007	36	26	05	352	355	371	355	371	377	411	424	421	376	267	265
713005	JICARILLA J	0011	25	26	05	367	389	386	408	386	391	455	455	429	353	278	275
713105	JICARILLA J	0012	35	26	05	352	358	368	358	374	377	438	451	416	386	270	265
713205	JICARILLA J	0013	36	26	05	343	349	358	352	373	377	411	429	412	386	270	262
713305	JICARILLA J	0014	35	26	05	346	355	365	364	370	377	415	429	405	348	268	262
704705	JICARILLA K	0002	11	25	05	355	355	367	364	371	377	411	415	418	356	308	278
704805	JICARILLA K	0003	01	25	05	355	352	364	365	370	374	405	415	415	344	301	283
704905	JICARILLA K	0004	02	25	05	352	368	367	358	373	380	411	418	442	342	319	276
705005	JICARILLA K	0005	02	25	05	352	352	367	361	370	352	411	415	412	354	304	276
705105	JICARILLA K	0006	11	25	05	349	391	367	358	377	353	380	425	438	-0-	458	-0-
705205	JICARILLA K	0007	12	25	05	388	361	367	367	377	371	405	402	411	330	314	259
705305	JICARILLA K	0008	12	25	05	382	364	377	364	370	371	399	408	420	361	349	291
705405	JICARILLA K	0009	12	25	05	359	361	412	367	371	371	405	408	411	382	386	-0-
714405	JICARILLA K	0010	01	25	05	340	352	359	361	422	371	407	424	402	339	275	262
715505	JICARILLA K	0013	11	25	05	-0-	398	389	374	370	373	411	424	431	-0-	486	-0-
715905	JICARILLA K	0014	11	25	05	CONNECTED		11-30-71									300
716105	JICARILLA K	0015	01	25	05	CONNECTED		12- 7-71									311
601805	NAVAJO INDIAN B	0001	30	27	08	205	224	229	286	239	234	244	275	259	219	196	210
601905	NAVAJO INDIAN B	0002	19	27	08	250	229	229	269	239	229	239	275	259	214	200	210
602005	NAVAJO INDIAN B	0003	19	27	08	239	229	244	297	244	234	239	270	264	224	196	219
602205	NAVAJO INDIAN B	0004	30	27	08	205	229	224	286	244	234	234	281	259	219	196	205
602305	NAVAJO INDIAN C	0001	31	27	08	200	222	229	292	244	234	234	275	259	224	196	203

1971 AVERAGE PRODUCING PRESSURE (CONTINUED)

CONTINENTIAL OIL CO (CONTINUED)

			Sec	Twp	Range	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
282605	AXI APACHE K	0005	10	26	05	367	370	389	390	392	402	441	461	448	390	328	284
232105	AXI APACHE L	0001	36	25	04	361	358	363	374	386	398	424	448	407	356	298	273
232205	AXI APACHE L	0002	36	25	04	349	355	374	355	367	374	411	411	408	350	270	270
232305	AXI APACHE L	0003	35	25	04	367	367	373	373	399	386	428	429	439	374	303	291
232405	AXI APACHE L	0004	26	25	04	364	370	373	380	377	386	415	418	412	353	289	289
232505	AXI APACHE L	0005	26	25	04	355	355	380	361	370	389	424	428	425	359	278	280
232605	AXI APACHE L	0006	25	25	04	361	361	370	361	374	383	421	428	416	365	286	283
232705	AXI APACHE M	0001	23	25	04	358	364	371	367	380	386	424	424	420	350	273	283
232805	AXI APACHE M	0003	13	25	04	374	358	279	364	373	383	424	421	419	353	286	278
232905	AXI APACHE M	0004	24	25	04	349	358	367	380	377	419	420	425	412	359	281	268
233005	AXI APACHE N	0001	11	25	04	355	358	380	367	376	382	414	418	409	353	277	308
280005	AXI APACHE N	0003	12	25	04	349	358	364	358	370	378	411	411	405	347	270	272
280705	AXI APACHE N	0004	12	25	04	358	361	358	353	383	386	414	415	405	353	275	292
280805	AXI APACHE N	0005	01	25	04	349	352	364	367	370	380	415	408	405	347	273	272
282805	AXI APACHE N	0006	01	25	04	371	358	361	355	370	377	408	412	412	356	272	273
282905	AXI APACHE N	0007	12	25	04	340	352	374	364	386	383	418	418	392	375	286	278
283005	AXI APACHE N	0008	02	25	04	352	358	361	358	367	390	414	415	406	341	278	267
233105	AXI APACHE O	0001	10	25	04	358	355	364	355	374	383	407	415	433	366	277	283
						(355)					(382)		(422)			8736	8566
MACDONALD OIL CORP																	
250505	SCOTT A	0001	15	26	06	189	194	198	282	227	212	212	280	258	203	174	170
250605	SCOTT B	0001	05	26	06	215	227	222	307	239	217	227	286	267	217	189	200
250705	SCOTT C	0001	13	26	06	198	208	225	276	237	222	219	289	263	203	182	194
250805	SCOTT D	0001	14	26	07	210	230	227	298	244	227	217	308	274	222	198	200
						(203)										743	764
SOUTHERN UNION PRODUCTION CO																	
703505	JICARILLA F	0002	33	26	04	346	355	361	358	370	390	414	411	409	356	283	270
704005	JICARILLA H	0003	19	26	04	367	370	383	373	386	399	438	435	415	362	289	288
704105	JICARILLA H	0004	19	26	04	383	373	379	370	386	394	438	442	421	365	288	286
704205	JICARILLA J	0002	35	26	05	349	355	361	361	367	371	408	418	429	347	313	279
704305	JICARILLA J	0003	26	26	05	370	392	260	377	386	398	448	465	425	359	291	289
704405	JICARILLA J	0004	26	26	05	373	389	386	373	395	405	448	461	425	359	285	288
704505	JICARILLA J	0005	25	26	05	376	377	383	370	392	416	445	456	422	399	451	-0-
704605	JICARILLA J	0006	25	26	05	367	377	386	368	389	403	445	447	412	362	278	286
710605	JICARILLA J	0007	36	26	05	352	355	371	355	371	377	411	424	421	376	267	265
713005	JICARILLA J	0011	25	26	05	367	389	386	408	386	391	455	455	429	353	278	275
713105	JICARILLA J	0012	35	26	05	352	358	368	358	374	377	438	451	416	386	270	265
713205	JICARILLA J	0013	36	26	05	343	349	358	352	373	377	411	429	412	386	270	262
713305	JICARILLA J	0014	35	26	05	346	355	365	364	370	377	415	429	405	348	268	262
704705	JICARILLA K	0002	11	25	05	355	355	367	364	371	377	411	415	418	356	308	278
704805	JICARILLA K	0003	01	25	05	355	352	364	365	370	374	405	415	415	344	301	283
704905	JICARILLA K	0004	02	25	05	352	368	367	358	373	380	411	418	442	342	319	276
705005	JICARILLA K	0005	02	25	05	352	352	367	361	370	352	411	415	412	354	304	276
705105	JICARILLA K	0006	11	25	05	349	391	367	358	377	353	380	425	438	-0-	458	-0-
705205	JICARILLA K	0007	12	25	05	388	361	367	367	377	371	405	402	411	330	314	259
705305	JICARILLA K	0008	12	25	05	382	364	377	364	370	371	399	408	420	361	349	291
705405	JICARILLA K	0009	12	25	05	359	361	412	367	371	371	405	408	411	382	386	-0-
714405	JICARILLA K	0010	01	25	05	340	352	359	361	422	371	407	424	402	339	275	262
715505	JICARILLA K	0013	11	25	05	-0-	398	389	374	370	373	411	424	431	-0-	486	-0-
715905	JICARILLA K	0014	11	25	05	CONNECTED	11-30-71										300
716105	JICARILLA K	0015	01	25	05	CONNECTED	12- 7-71										311
601805	NAVAJO INDIAN B	0001	30	27	08	205	224	229	286	239	234	244	275	259	219	196	210
601905	NAVAJO INDIAN B	0002	19	27	08	250	229	229	269	239	229	239	275	259	214	200	210
602005	NAVAJO INDIAN B	0003	19	27	08	239	229	244	297	244	234	239	270	264	224	196	219
602205	NAVAJO INDIAN B	0004	30	27	08	205	229	224	286	244	234	234	281	259	219	196	205
602305	NAVAJO INDIAN C	0001	31	27	08	200	222	229	292	244	234	234	275	259	224	196	203

Jan 1971 diff Calkins vs Conoco Press 152 # Total Ave

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AVERAGE PRODUCING PRESSURE

CASE #4628
SOUTHERN UNION GAS COMPANY
EXHIBIT 4
AVERAGE PRODUCING PRESSURE
GAS COMPANY CONNECTIONS
SOUTH BLANCO PICTURED CLIFF POOL

AZTEC OIL & GAS CO

			Sec	Twp	Range	Jan. 1 CHART	Jan. 9 CHANGING SUSPENDED
200305	ARIZ JICARILLA	0001	35	25	04		
200405	ARIZ JICARILLA	0002	26	25	04	280	270
200605	ARIZ JICARILLA	0004	36	25	04	281	269
200705	ARIZ JICARILLA	0005	25	25	04	270	259
200805	ARIZ JICARILLA	0006	36	25	04	302	291
200905	ARIZ JICARILLA	0007	26	25	04	270	270
201005	ARIZ JICARILLA	0008	25	25	04	270	259
201105	ARIZ JICARILLA	A0001	23	25	04	DISCONNECTED 10-10-71	
201205	ARIZ JICARILLA	A0002	24	25	04	CHART CHANGING SUSPENDED	
201305	ARIZ JICARILLA	A0003	13	25	04	291	270
256905	ARIZ JICARILLA	A0004	24	25	04	270	259
201505	ARIZ JICARILLA	B0001	04	26	05	349	349
201605	ARIZ JICARILLA	B0002	09	26	05	291	280
201705	ARIZ JICARILLA	B0003	10	26	05	302	280
	OPERATOR TOTAL						
ABRAHAM J R							
276505	CHARLES M	0001	07	25	03	280	270
277205	CHARLES M	0002	07	25	03	291	270
	OPERATOR TOTAL						
CAULKINS PRODUCING CO							
203005	BREECH	0221	13	26	07	210	219
203105	BREECH	0224	13	26	07	280	200
203505	BREECH	0283	13	26	07	200	210
203705	BREECH	0310	13	26	07	210	210
203805	BREECH	0312	18	26	06	210	210
203905	BREECH A	0125	08	26	06	210	219
204005	BREECH A	0127	08	26	06	210	219
204105	BREECH A	0129	09	25	06	219	210
204205	BREECH A	0131	09	26	06	191	182
204305	BREECH A	0133	10	26	06	191	182
204405	BREECH A	0135	10	26	06	200	191
204505	BREECH A	0177	09	26	06	182	182
204605	BREECH A	0179	09	26	06	182	174
204705	BREECH A	0181	10	26	06	200	219
204805	BREECH A	0183	10	26	06	200	249
278105	BREECH B	0123	07	26	06	210	210
205005	BREECH B	0220	14	26	07	249	239
205105	BREECH B	0281	14	26	07	-0-	-0-
205205	BREECH C	0241	14	26	06	186	174
205405	BREECH C	0299	14	26	06	210	182
205505	BREECH C	0301	14	26	06	191	165
205605	BREECH C	0328	13	26	06	219	191
205705	BREECH D	0185	11	26	06	210	249
203405	BREECH D	0237	15	26	06	174	165
205805	BREECH D	0239	15	26	06	182	174
205905	BREECH D	0345	22	26	06	191	182
206005	BREECH E	0049	05	26	06	219	200
206305	BREECH E	0081	05	26	06	200	205
206505	BREECH E	0083	05	26	06	210	200
206705	BREECH E	0085	04	26	06	200	200
206605	BREECH E	0087	04	26	06	191	182
234205	KAIME	0001	20	26	06	200	191
249005	REUTER	0297	15	26	06	174	165
249105	REUTER	0343	22	26	06	-0-	-0-
252105	STATE A	0295	16	26	06	174	-0-
252205	STATE B COM	0233	16	26	06	200	200
252505	STATE C COM	0235	16	26	06	174	165
	OPERATOR TOTAL						
CONTINENTAL OIL CO							
230805	AXI APACHE J	0001	05	25	05	249	249
230905	AXI APACHE J	0002	05	25	05	249	249
231005	AXI APACHE J	0003	06	25	05	259	259
231105	AXI APACHE J	0005	07	25	05	249	249
231205	AXI APACHE J	0006	07	25	05	249	249
231305	AXI APACHE J	0007	08	25	05	219	210
231405	AXI APACHE J	0008	08	25	05	249	229
281305	AXI APACHE J	0010	05	25	05	270	249
281505	AXI APACHE J	0011	06	25	05	259	249
286305	AXI APACHE J	0012	05	25	05	249	249
231905	AXI APACHE K	0002	04	26	05	349	337
232005	AXI APACHE K	0003	09	26	05	302	270
282405	AXI APACHE K	0004	03	26	05	291	280

AVERAGE PRODUCING PRESSURE

CASE #4628
SOUTHERN UNION GAS COMPANY
EXHIBIT 4
AVERAGE PRODUCING PRESSURE
GAS COMPANY CONNECTIONS
SOUTH BLANCO PICTURED CLIFF POOL

			Sec	Twp	Range	Jan. 1	Jan. 9
AZTEC OIL & GAS CO							
200305	ARIZ JICARILLA	0001	35	25	04	CHART CHANGING SUSPENDED	
200405	ARIZ JICARILLA	0002	26	25	04	280	270
200605	ARIZ JICARILLA	0004	36	25	04	281	269
200705	ARIZ JICARILLA	0005	25	25	04	270	259
200805	ARIZ JICARILLA	0006	36	25	04	302	291
200905	ARIZ JICARILLA	0007	26	25	04	270	270
201005	ARIZ JICARILLA	0008	25	25	04	270	259
201105	ARIZ JICARILLA	A0001	23	25	04	DISCONNECTED 10-10-71	
201205	ARIZ JICARILLA	A0002	24	25	04	CHART CHANGING SUSPENDED	
201305	ARIZ JICARILLA	A0003	13	25	04	291	270
256905	ARIZ JICARILLA	A0004	24	25	04	270	259
201505	ARIZ JICARILLA	B0001	04	26	05	349	349
201605	ARIZ JICARILLA	B0002	09	26	05	291	280
201705	ARIZ JICARILLA	B0003	10	26	05	302	280
		OPERATOR TOTAL					
ABRAHAM J R							
276505	CHARLES M	0001	07	25	03	280	270
277205	CHARLES M	0002	07	25	03	291	270
		OPERATOR TOTAL					
CAULKINS PRODUCING CO							
203005	BREECH	0221	13	26	07	210	219
203105	BREECH	0224	13	26	07	280	200
203505	BREECH	0283	13	26	07	200	210
203705	BREECH	0310	13	26	07	210	210
203805	BREECH	0312	18	26	06	210	210
203905	BREECH A	0125	08	26	06	210	219
204005	BREECH A	0127	08	26	06	210	219
204105	BREECH A	0129	09	26	06	219	210
204205	BREECH A	0131	09	26	06	191	182
204305	BREECH A	0133	10	26	06	191	182
204405	BREECH A	0135	10	26	06	200	191
204505	BREECH A	0177	09	26	06	182	182
204605	BREECH A	0179	09	26	06	182	174
204705	BREECH A	0181	10	26	06	200	219
204805	BREECH A	0183	10	26	06	200	249
278105	BREECH B	0123	07	26	06	210	210
205005	BREECH B	0220	14	26	07	249	239
205105	BREECH B	0281	14	26	07	-0-	-0-
205205	BREECH C	0241	14	26	06	186	174
205405	BREECH C	0299	14	26	06	210	182
205505	BREECH C	0301	14	26	06	191	165
205605	BREECH C	0328	13	26	06	219	191
205705	BREECH D	0185	11	26	06	210	249
203405	BREECH D	0237	15	26	06	174	165
205805	BREECH D	0239	15	26	06	182	174
205905	BREECH D	0345	22	26	06	191	182
206005	BREECH E	0049	05	26	06	219	200
206305	BREECH E	0081	05	26	06	200	205
206505	BREECH E	0083	05	26	06	210	200
206705	BREECH E	0085	04	26	06	200	200
206605	BREECH E	0087	04	26	06	191	182
234205	KAIME	0001	20	26	06	200	191
249005	REUTER	0297	15	26	06	174	165
249105	REUTER	0343	22	26	06	-0-	-0-
252105	STATE A	0295	16	26	06	174	-0-
252205	STATE B COM	0233	16	26	06	200	200
252505	STATE C COM	0235	16	26	06	174	165
		OPERATOR TOTAL					
CONTINENTAL OIL CO							
230805	AXI APACHE J	0001	05	25	05	249	249
230905	AXI APACHE J	0002	05	25	05	249	249
231005	AXI APACHE J	0003	06	25	05	259	259
231105	AXI APACHE J	0005	07	25	05	249	249
231205	AXI APACHE J	0006	07	25	05	249	249
231305	AXI APACHE J	0007	08	25	05	219	210
231405	AXI APACHE J	0008	08	25	05	249	229
281305	AXI APACHE J	0010	05	25	05	270	249
281505	AXI APACHE J	0011	06	25	05	259	249
286305	AXI APACHE J	0012	05	25	05	249	249
231905	AXI APACHE K	0002	04	26	05	349	337
232005	AXI APACHE K	0003	09	26	05	302	270
282405	AXI APACHE K	0004	03	26	05	291	280

10 above 250#
1 above 300#

197
196.7
7474/38 = 197
38 wells 1/4 Mc Donald wells
165-249
16 wells @ 200#
16 below 200#
261
7829/30 = 261.0
29 wells above 250
1 above 300#
30 wells
SU #4
Cs 4628

AVERAGE PRODUCING PRESSURE

CONTINENTAL OIL CO (CONTINUED)

			Sec	Twp	Range	Jan. 1	Jan. 9
282605	AXI APACHE K	0005	10	26	05	302	291
232105	AXI APACHE L	0001	36	25	04	270	270
232205	AXI APACHE L	0002	36	25	04	270	259
232305	AXI APACHE L	0003	35	25	04	280	270
232405	AXI APACHE L	0004	26	25	04	270	-0-
232505	AXI APACHE L	0005	26	25	04	291	270
232605	AXI APACHE L	0006	25	25	04	280	259
232705	AXI APACHE M	0001	23	25	04	280	270
232805	AXI APACHE M	0003	13	25	04	270	270
232905	AXI APACHE M	0004	24	25	04	270	259
233005	AXI APACHE N	0001	11	25	04	280	270
280005	AXI APACHE N.	0003	12	25	04	270	259
280705	AXI APACHE N	0004	12	25	04	280	259
280805	AXI APACHE N	0005	01	25	04	270	259
282805	AXI APACHE N	0006	01	25	04	280	259
282905	AXI APACHE N	0007	12	25	04	270	259
283005	AXI APACHE N	0008	02	25	04	270	259
233105	AXI APACHE O	0001	10	25	04	270	259
		OPERATOR TOTAL					261 # Av
MACDONALD OIL CORP							
250505	SCOTT A	0001	15	26	06	174	165
250605	SCOTT B	0001	05	26	06	219	210
250705	SCOTT C	0001	13	26	06	191	174
250805	SCOTT D	0001	14	26	07	210	210
		OPERATOR TOTAL					
SOUTHERN UNION PRODUCTION CO							
703505	JICARILLA F	0002	33	26	04	270	270
704005	JICARILLA H	0003	19	26	04	280	270
704105	JICARILLA H	0004	19	26	04	291	270
704205	JICARILLA J	0002	35	26	05	270	249
704305	JICARILLA J	0003	26	26	05	291	270
704405	JICARILLA J	0004	26	26	05	291	280
704505	JICARILLA J	0005	25	26	05	-0-	-0-
704605	JICARILLA J	0006	25	26	05	280	270
710605	JICARILLA J	0007	36	26	05	270	259
713005	JICARILLA J	0011	25	26	05	270	259
713105	JICARILLA J	0012	35	26	05	270	254
713205	JICARILLA J	0013	36	26	05	259	249
713305	JICARILLA J	0014	35	26	05	259	249
704705	JICARILLA K	0002	11	25	05	270	249
704805	JICARILLA K	0003	01	25	05	270	259 25 wells
704905	JICARILLA K	0004	02	25	05	259	249 alone 20#
705005	JICARILLA K	0005	02	25	05	259	249
705105	JICARILLA K	0006	11	25	05	-0-	-0-
705205	JICARILLA K	0007	12	25	05	270	259
705305	JICARILLA K	0008	12	25	05	259	249
705405	JICARILLA K	0009	12	25	05	-0-	-0-
714405	JICARILLA K	0010	01	25	05	259	249
715505	JICARILLA K	0013	11	25	05	-0-	-0-
715905	JICARILLA K	0014	11	25	05	270	-0-
716105	JICARILLA K	0015	01	25	05	270	259
601805	NAVAJO INDIAN B	0001	30	27	08		229
601905	NAVAJO INDIAN B	0002	19	27	08		238
602005	NAVAJO INDIAN B	0003	19	27	08		238
602205	NAVAJO INDIAN B	0004	30	27	08		229
602305	NAVAJO INDIAN C	0001	31	27	08		229
		OPERATOR TOTAL					
		POOL TOTAL					

PRODUCTION, 1971

AZTEC OIL & GAS CO

| | | |

PRODUCTION, 1971 (CONTINUED)

CONTINENTAL OIL CO (CONTINUED)

			Sec	Twp	Range	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
282605	AXI APACHE K	0005	10	26	05	1,677	1,564	1,470	1,363	1,997	1,856	1,535	1,333	1,688	1,301	1,858	1,468	19,110
232105	AXI APACHE L	0001	36	25	04	2,084	1,986	1,125	1,071	1,394	1,225	1,081	4,631	944	1,367	1,714	1,754	20,376
232205	AXI APACHE L	0002	36	25	04	1,710	1,245	1,057	1,536	1,084	1,242	523	1,086	1,053	2,196	2,477	1,654	16,863
232305	AXI APACHE L	0003	35	25	04	1,041	897	455	797	514	651	41	2,003	2,393	226	2,790	1,447	13,255
232405	AXI APACHE L	0004	26	25	04	1,583	831	795	167	1,430	1,408	695	1,051	1,123	2,154	2,567	1,467	15,212
232505	AXI APACHE L	0005	26	25	04	513	591	528	922	645	654	159	546	426	955	737	383	7,059
232605	AXI APACHE L	0006	25	25	04	290	223	367	345	189	269	-0-	260	311	539	510	355	3,658
232705	AXI APACHE M	0001	23	25	04	573	761	643	651	504	512	668	614	1,778	854	885	678	9,221
232805	AXI APACHE M	0003	13	25	04	1,524	1,426	937	1,899	1,198	1,069	419	1,168	944	1,231	1,936	1,376	15,127
232905	AXI APACHE M	0004	24	25	04	935	930	847	1,092	710	750	44	503	786	1,199	2,234	2,556	12,593
233005	AXI APACHE N	0001	11	25	04	2,936	2,791	1,792	2,890	2,239	2,091	2,329	2,304	2,494	4,136	7,788	3,280	37,076
280005	AXI APACHE N	0003	12	25	04	1,806	1,495	1,415	1,893	1,090	968	844	921	1,197	2,015	4,003	3,195	20,842
280705	AXI APACHE N	0004	12	25	04	1,715	1,943	1,549	1,798	1,194	959	357	998	1,409	1,726	2,295	1,915	17,858
280805	AXI APACHE N	0005	01	25	04	1,632	1,475	1,148	1,373	1,182	1,008	11	700	1,205	1,156	1,798	1,045	13,733
282805	AXI APACHE N	0006	01	25	04	488	331	322	572	253	440	80	436	452	1,453	1,528	934	7,289
282905	AXI APACHE N	0007	12	25	04	1,363	2,893	2,748	3,759	2,228	3,993	2,199	2,975	3,421	3,370	4,910	2,499	36,368
283005	AXI APACHE N	0008	02	25	04	1,703	1,976	1,661	2,255	1,428	1,074	1,443	1,515	3,591	2,075	2,206	2,597	21,524
233105	AXI APACHE O	0001	10	25	04	1,277	1,576	1,108	1,374	1,073	995	700	1,893	2,746	3,311	2,263	1,463	19,779
		OPERATOR TOTAL				44,512	43,487	33,285	41,936	33,958	34,964	21,751	34,545	38,027	58,545	71,963 ✓	55,645 ✓	512,620
																77.6	61.5	
MACDONALD OIL CORP																		
250505	SCOTT A	0001	15	26	06	3,230	3,265	2,701	2,720	3,552	3,307	3,311	2,534	3,026	2,606	3,785	2,907	36,924
250605	SCOTT B	0001	05	26	06	1,780	1,842	1,887	1,569	2,013	1,847	2,121	1,685	2,405	2,181	1,914	1,911	22,155
250705	SCOTT C	0001	13	26	06	3,490	3,202	2,827	2,839	3,656	3,018	3,761	2,833	3,283	3,310	3,435	3,245	38,909
250805	SCOTT D	0001	14	26	07	2,130	1,813	1,944	1,771	1,960	2,120	2,101	1,532	1,514	2,373	2,157	2,182	23,427
		OPERATOR TOTAL				10,630	10,122	9,359	8,899	11,171	10,292	11,294	8,584	9,228	10,470	11,291	10,245	121,395
SOUTHERN UNION PRODUCTION CO																		
703505	JICARILLA F	0002	33	26	04	2,666	2,274	1,846	2,434	1,789	1,398	1,292	1,236	1,966	2,308	2,046	1,926	23,181
704005	JICARILLA H	0003	19	26	04	1,285	1,243	1,014	1,150	723	873	45	556	1,090	1,244	1,543	1,496	12,262
704105	JICARILLA H	0004	19	26	04	418	246	342	577	298	209	99	287	436	623	633	956	5,124
704205	JICARILLA J	0002	35	26	05	837	938	532	761	519	703	433	467	434	1,076	726	1,038	8,464
704305	JICARILLA J	0003	26	26	05	2,505	2,452	1,868	1,916	1,823	1,797	509	941	1,315	2,220	2,684	3,179	23,209
704405	JICARILLA J	0004	26	26	05	1,613	1,382	1,212	1,074	1,149	2,787	1,255	841	784	3,171	6,395	4,225	25,888
704505	JICARILLA J	0005	25	26	05	3,345	2,905	2,207	3,145	3,077	2,028	1,143	1,012	3,258	1,786	333	-0-	24,239
704605	JICARILLA J	0006	25	26	05	1,657	1,257	1,069	1,433	1,191	981	317	722	1,378	1,677	1,991	1,877	15,550
710605	JICARILLA J	0007	36	26	05	3,007	3,043	2,493	2,878	2,206	2,370	1,419	1,506	1,395	2,778	3,046	3,045	29,186
713005	JICARILLA J	0011	25	26	05	5,193	4,758	3,630	4,677	2,554	2,933	1,620	1,620	3,439	4,301	5,126	4,468	44,319
713105	JICARILLA J	0012	35	26	05	3,613	3,253	2,657	3,240	2,552	2,576	1,370	1,660	1,708	2,077	2,773	2,339	29,818
713205	JICARILLA J	0013	36	26	05	2,543	2,219	1,964	2,145	1,919	1,872	1,404	1,437	1,095	2,032	2,403	2,124	23,158
713305	JICARILLA J	0014	35	26	05	4,310	3,632	3,008	3,286	2,566	2,759	1,798	1,738	2,779	3,783	5,795	4,747	40,301
704705	JICARILLA K	0002	11	25	05	6,279	5,338	5,161	5,519	5,281	5,625	2,706	3,669	3,255	6,275	7,028	7,164	63,300
704805	JICARILLA K	0003	01	25	05	353	318	187	210	275	301	233	266	190	235	449	304	3,221
704905	JICARILLA K	0004	02	25	05	3,463	3,503	2,859	3,421	2,986	3,196	2,261	2,319	1,724	4,131	3,753	4,231	37,837
705005	JICARILLA K	0005	02	25	05	6,918	6,371	4,807	6,213	4,759	4,200	2,988	3,485	4,355	8,164	9,816	8,503	70,179
705105	JICARILLA K	0006	11	25	05	16,121	13,999	11,058	14,769	7,007	11,749	6,350	5,337	3,987	-0-	117	-0-	90,494
705205	JICARILLA K	0007	12	25	05	5,522	4,584	2,037	3,630	3,744	3,509	809	2,357	1,339	4,981	6,752	6,055	44,319
705305	JICARILLA K	0008	12	25	05	3,284	3,203	2,361	3,256	2,562	2,763	1,044	948	1,066	536	2,040	5,904	28,967
705405	JICARILLA K	0009	12	25	05	8,302	726	4,119	9,876	6,279	6,161	3,133	3,137	3,192	4,513	1,032	-0-	50,470
714405	JICARILLA K	0010	01	25	05	3,737	2,941	2,043	2,025	1,838	1,005	813	1,075	1,692	2,075	1,924	1,482	22,650
715505	JICARILLA K	0013	11	25	05	-0-	10,510	12,439	7,988	5,944	15,162	10,894	6,234	2,124	-0-	1,761	-0-	73,056
715905	JICARILLA K	0014	11	25	05	CONNECTED	11-30-71										11,774	11,774
716105	JICARILLA K	0015	01	25	05	CONNECTED	12- 7-71										8,586	8,586
601805	NAVAJO INDIAN B	0001	30	27	08	653	491	572	312	736	964	1,083	793	901	884	936	666	6,991
601905	NAVAJO INDIAN B	0002	19	27	08	1,465	1,239	1,110	727	1,391	1,224	810	798	1,079	1,426	1,517	1,047	13,833
602005	NAVAJO INDIAN B	0003	19	27	08	656	720	546	567	683	711	649	552	457	874	979	721	8,115
602205	NAVAJO INDIAN B	0004	30	27	08	3,093	2,641	2,334	1,289	2,353	3,042	2,682	1,620	2,568	3,243	3,020	2,251	30,136
602305	NAVAJO INDIAN C	0001	31	27	08	1,881	1,192	886	1,178	2,222	1,177	1,107	1,511	2,297	980	934	609	15,983
		OPERATOR TOTAL				94,719	87,378	76,361	89,696	70,425	84,075	50,266	47,124	51,294	67,402	77,152	90,717	885,610
		POOL TOTAL				310,820	305,786	249,714	238,854	267,556	270,628	206,830	186,936	226,570	284,418	296,407	296,960	3,144,579

72 JC
Lowry

PRODUCTION, 1971 (CONTINUED)

CONTINENTAL OIL CO (CONTINUED)

			Sec	Twp	Range	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
282605	AXI APACHE K	0005	10	26	05	1,677	1,564	1,470	1,363	1,997	1,856	1,535	1,333	1,688	1,301	1,858	1,468	19,110
232105	AXI APACHE L	0001	36	25	04	2,034	1,985	1,225	1,071	1,394	1,225	1,081	4,631	944	1,367	1,714	1,754	20,376
232205	AXI APACHE L	0002	36	25	04	1,710	1,215	1,057	1,536	1,084	1,242	523	1,086	1,053	2,196	2,477	1,654	16,863
232305	AXI APACHE L	0003	35	25	04	1,041	897	455	797	514	651	41	2,003	2,393	226	2,790	1,447	13,255
232405	AXI APACHE L	0004	26	25	04	1,523	831	705	167	1,430	1,408	69	1,051	1,123	2,154	2,567	1,467	15,212
232505	AXI APACHE L	0005	26	25	04	513	591	528	922	645	654	159	546	426	955	737	383	7,059
232605	AXI APACHE L	0006	25	25	04	290	223	367	345	189	269	-0-	260	311	539	510	355	3,658
232705	AXI APACHE M	0001	23	25	04	573	761	643	651	504	512	668	614	1,778	854	885	678	9,221
232805	AXI APACHE M	0003	13	25	04	1,524	1,426	937	1,899	1,198	1,059	419	1,168	944	1,231	1,936	1,376	15,127
232905	AXI APACHE M	0004	24	25	04	936	930	847	1,092	710	75.	44	503	785	1,199	2,234	2,556	12,593
233005	AXI APACHE N	0001	11	25	04	2,536	2,791	1,792	2,895	2,239	2,091	2,329	2,304	2,494	4,136	7,788	3,280	37,076
280005	AXI APACHE N	0003	12	25	04	1,806	1,495	1,415	1,893	1,090	968	844	921	1,197	2,015	4,003	3,195	20,842
280705	AXI APACHE N	0004	12	25	04	1,715	1,943	1,549	1,798	1,194	959	357	998	1,409	1,726	2,295	1,915	17,858
280805	AXI APACHE N	0005	01	25	04	1,632	1,475	1,148	1,373	1,182	1,008	11	700	1,205	1,156	1,798	1,045	13,733
282805	AXI APACHE N	0006	01	25	04	488	331	322	572	253	440	80	436	452	1,453	1,528	934	7,289
282905	AXI APACHE N	0007	12	25	04	1,563	2,893	2,748	3,769	2,228	3,993	2,199	2,975	3,421	3,370	4,910	2,499	36,368
283005	AXI APACHE N	0008	02	25	04	1,703	1,976	1,661	2,255	1,423	1,074	1,443	1,515	1,591	2,075	2,206	2,597	21,524
233105	AXI APACHE O	0001	10	25	04	1,277	1,576	1,108	1,374	1,073	595	700	1,893	2,746	3,311	2,263	1,463	19,779
		OPERATOR TOTAL				44,512	43,487	33,285	41,936	33,958	34,964	21,751	34,545	38,027	58,545	71,963	55,645	512,620
																77.6	61.5	
MACDONALD OIL CORP																		
250505	SCOTT A	0001	15	26	06	3,230	3,265	2,701	2,720	3,532	3,307	3,311	2,534	3,026	2,606	3,785	2,907	36,924
250605	SCOTT B	0001	05	26	06	1,780	1,842	1,887	1,569	2,013	1,847	2,121	1,685	1,405	2,181	1,914	1,911	22,155
250705	SCOTT C	0001	13	26	06	3,490	3,202	2,827	2,839	3,666	3,018	3,761	2,833	3,283	3,310	3,435	3,245	38,909
250805	SCOTT D	0001	14	26	07	2,130	1,813	1,944	1,771	1,960	2,120	2,101	1,522	1,514	2,373	2,157	2,182	23,597
		OPERATOR TOTAL				10,930	10,122	9,359	8,899	11,171	10,292	11,294	8,564	9,228	10,470	11,291	10,245	121,585
SOUTHERN UNION PRODUCTION CO																		
703505	JICARILLA F	0002	33	26	04	2,366	2,274	1,846	2,434	1,789	1,398	1,292	1,236	1,966	2,308	2,046	1,926	23,181
704005	JICARILLA H	0003	19	26	04	1,285	1,243	1,014	1,150	723	873	45	556	1,090	1,244	1,543	1,496	12,262
704105	JICARILLA H	0004	19	26	04	418	246	342	577	298	209	99	287	436	623	633	956	5,124
704205	JICARILLA J	0002	35	26	05	837	938	532	761	519	703	433	467	434	1,076	726	1,038	8,464
704305	JICARILLA J	0003	26	26	05	2,505	2,452	1,868	1,916	1,823	1,797	509	941	1,315	2,220	2,684	3,179	23,209
704405	JICARILLA J	0004	26	26	05	1,613	1,382	1,212	1,074	1,149	2,787	1,255	841	784	3,171	6,395	4,225	25,888
704505	JICARILLA J	0005	25	26	05	3,345	2,905	2,207	3,145	3,077	2,028	1,143	1,012	3,258	1,786	333	-0-	24,239
704605	JICARILLA J	0006	25	26	05	1,657	1,257	1,069	1,433	1,191	981	317	722	1,378	1,677	1,991	1,877	15,550
710605	JICARILLA J	0007	36	26	05	3,007	3,043	2,493	2,878	2,206	2,370	1,419	1,506	1,395	2,778	3,046	3,045	29,186
71[illegible]05	JICARILLA J	0011	25	26	05	5,193	4,758	3,630	4,677	2,554	2,933	1,620	1,620	3,439	4,301	5,126	4,468	44,319
713105	JICARILLA J	0012	35	26	05	3,613	3,253	2,657	3,240	2,552	2,576	1,370	1,660	1,708	2,077	2,773	2,339	29,818
713205	JICARILLA J	0013	36	26	05	2,543	2,219	1,964	2,145	1,919	1,872	1,404	1,437	1,095	2,032	2,403	2,124	23,158
713305	JICARILLA J	0014	35	26	05	4,310	3,632	3,008	3,286	2,666	2,759	1,798	1,738	2,779	3,783	5,795	4,747	40,301
704705	JICARILLA K	0002	11	25	05	6,279	5,338	5,161	5,519	5,281	5,625	2,706	3,669	3,255	6,275	7,028	7,164	63,300
704805	JICARILLA K	0003	01	25	05	353	318	187	210	175	301	233	266	190	235	449	304	3,221
704905	JICARILLA K	0004	02	25	05	3,463	3,503	2,859	3,421	2,986	3,196	2,261	2,319	1,714	4,131	3,753	4,231	37,837
705005	JICARILLA K	0005	02	25	05	6,918	6,371	4,807	6,213	4,759	4,200	2,988	3,485	4,355	8,164	9,416	8,503	70,179
705105	JICARILLA K	0006	11	25	05	16,121	13,999	11,058	14,769	7,007	11,749	6,350	5,337	3,987	-0-	117	-0-	90,494
705205	JICARILLA K	0007	12	25	05	5,522	4,584	2,037	3,630	3,744	3,509	809	1,357	1,339	4,981	6,752	6,055	44,319
705305	JICARILLA K	0008	12	25	05	3,284	3,203	2,361	3,256	2,562	2,763	1,040	948	1,066	536	2,040	5,904	28,967
705405	JICARILLA K	0009	12	25	05	8,302	726	4,119	9,876	6,279	6,161	3,132	3,137	3,192	4,513	1,032	-0-	50,470
714405	JICARILLA K	0010	01	25	05	3,737	2,941	2,043	2,025	1,838	1,005	813	1,075	1,692	2,075	1,984	1,482	22,650
715505	JICARILLA K	0013	11	25	05	-0-	10,510	12,439	7,988	5,944	15,162	10,894	6,234	2,124	-0-	1,761	-0-	73,056
715905	JICARILLA K	0014	11	25	05	CONNECTED	11-30-71										11,774	11,774
716105	JICARILLA K	0015	01	25	05	CONNECTED	12- 7-71										8,586	8,586
601805	NAVAJO INDIAN B	0001	30	27	08	653	491	572	312	736	964	1,083	793	901	884	936	666	8,991
601905	NAVAJO INDIAN B	0002	19	27	08	1,465	1,239	1,110	727	1,391	1,224	810	798	1,075	1,426	1,527	1,047	13,833
602005	NAVAJO INDIAN B	0003	19	27	08	656	720	545	567	683	711	649	552	457	874	979	721	8,115
602205	NAVAJO INDIAN B	0004	30	27	08	3,093	2,641	2,334	1,289	2,353	3,042	2,682	1,620	2,568	3,243	3,020	2,251	30,136
602305	NAVAJO INDIAN C	0001	31	27	08	1,881	1,192	886	1,178	2,222	1,177	1,107	1,511	2,297	989	934	609	15,983
		OPERATOR TOTAL				94,719	87,378	76,361	89,696	70,426	84,075	50,266	47,124	51,294	67,402	77,152	90,717	886,610
		POOL TOTAL				310,820	305,786	249,714	238,854	267,556	270,628	206,830	188,936	226,570	284,418	296,407	296,960	3,144,579

72 [illegible]

1-26-72

PRODUCTION, 1972

CASE #4628
SOUTHERN UNION GAS COMPANY
EXHIBIT ____
PRODUCTION, 1972
GAS COMPANY CONNECTIONS
SOUTH BLANCO PICTURED CLIFF POOL

			Sec	Twp	Range	Jan. 1	Jan. 9
AZTEC OIL & GAS CO						CHART	CHANGING SUSPENDED
200305	ARIZ JICARILLA	0001	35	25	04	440	625
200405	ARIZ JICARILLA	0002	26	25	04	828	796
200605	ARIZ JICARILLA	0004	36	25	04	457	486
200705	ARIZ JICARILLA	0005	25	25	04	1,438	1,134
200805	ARIZ JICARILLA	0006	35	25	04	636	666
200905	ARIZ JICARILLA	0007	26	25	04	265	88
201005	ARIZ JICARILLA	0008	25	25	04	DISCONNECTED	10-10-71
201105	ARIZ JICARILLA	A0001	23	25	04	CHART	CHANGING SUSPENDED
201205	ARIZ JICARILLA	A0002	24	25	04	108	148
201305	ARIZ JICARILLA	A0003	13	25	04	82	119
256905	ARIZ JICARILLA	A0004	24	25	04	334	771
201505	ARIZ JICARILLA	B0001	04	26	05	368	167
201605	ARIZ JICARILLA	B0002	09	26	05	70	201
201705	ARIZ JICARILLA	B0003	10	26	05	5,026	5,201
		OPERATOR TOTAL					
ABRAHAM J R							
276505	CHARLES M	0001	07	25	03	441	398
277205	CHARLES M	0002	07	25	03	60	49
		OPERATOR TOTAL				501	447
CAULKINS PRODUCING CO							
203005	BREECH	0221	13	26	07	1,378	1,143
203105	BREECH	0224	13	26	07	920	733
203505	BREECH	0283	13	26	07	302	460
203705	BREECH	0310	13	26	07	416	445
203805	BREECH	0312	18	26	06	363	543
203905	BREECH A	0125	08	26	06	1,260	1,035
204005	BREECH A	0127	08	26	06	857	1,060
204105	BREECH A	0129	09	26	06	1,865	2,178
204205	BREECH A	0131	09	26	06	1,433	1,523
204305	BREECH A	0133	10	26	06	459	408
204405	BREECH A	0135	10	26	06	339	338
204505	BREECH A	0177	09	26	06	815	734
204605	BREECH A	0179	09	26	06	1,377	1,422
204705	BREECH A	0181	10	26	06	1,836	909
204805	BREECH A	0183	10	26	06	517	129
278105	BREECH B	0123	07	26	06	513	299
205005	BREECH B	0220	14	26	07	485	417
205105	BREECH B	0281	14	26	07	-0-	-0-
205205	BREECH C	0241	14	26	06	808	882
205405	BREECH C	0299	14	26	06	4,015	4,768
205505	BREECH C	0301	14	26	06	1,118	942
205605	BREECH C	0328	13	26	06	659	667
205705	BREECH D	0185	11	26	06	428	196
203405	BREECH D	0237	15	26	06	286	333
205805	BREECH D	0239	15	26	06	2,090	2,434
205905	BREECH D	0345	22	26	06	554	649
206005	BREECH E	0049	05	26	06	696	685
206305	BREECH E	0081	05	26	06	808	792
206505	BREECH E	0083	05	26	06	1,376	1,493
206705	BREECH E	0085	04	26	06	761	895
206605	BREECH E	0087	04	26	06	743	772
234205	KAIME	0001	20	26	06	114	133
249005	REUTER	0297	15	26	06	1,212	1,303
249105	REUTER	0343	22	26	06	-0-	-0-
252105	STATE A	0295	16	26	06	421	-0-
252205	STATE B COM	0233	16	26	06	586	1,087
252505	STATE C COM	0235	16	26	06	525	615
						32,335	32,422
CONTINENTAL OIL CO		OPERATOR TOTAL					
230805	AXI APACHE J	0001	05	25	05	1,684	1,572
230905	AXI APACHE J	0002	05	25	05	682	727
231005	AXI APACHE J	0003	06	25	05	297	689
231105	AXI APACHE J	0005	07	25	05	143	147
231205	AXI APACHE J	0006	07	25	05	306	298
231305	AXI APACHE J	0007	08	25	05	273	327
231405	AXI APACHE J	0008	08	25	05	74	23
281305	AXI APACHE J	0010	05	25	05	1,203	1,467
281505	AXI APACHE J	0011	06	25	05	277	627
286305	AXI APACHE J	0012	05	25	05	420	428
231905	AXI APACHE K	0002	04	26	05	188	174
232005	AXI APACHE K	0003	09	26	05	383	421
282405	AXI APACHE K	0004	03	26	05	134	144

CONTINENTAL OIL CO (CONTINUED)

			Sec	Twp	Range	Jan. 1	Jan. 9
282605	AXI APACHE K	0005	10	26	05	357	390
232105	AXI APACHE L	0001	36	25	04	284	287
232205	AXI APACHE L	0002	36	25	04	454	400
232305	AXI APACHE L	0003	35	25	04	395	496
232405	AXI APACHE L	0004	26	25	04	320	-0-
232505	AXI APACHE L	0005	26	25	04	68	239
232605	AXI APACHE L	0006	25	25	04	95	232
232705	AXI APACHE M	0001	23	25	04	155	226
232805	AXI APACHE M	0003	13	25	04	344	483
232905	AXI APACHE M	0004	24	25	04	624	184
233005	AXI APACHE N	0001	13	25	04	955	1,254
280005	AXI APACHE N	0003	12	25	04	741	871
280705	AXI APACHE N	0004	12	25	04	533	581
280805	AXI APACHE N	0005	01	25	04	270	384
282805	AXI APACHE N	0006	01	25	04	180	355
282905	AXI APACHE N	0007	12	25	04	852	1,166
283005	AXI APACHE N	0008	02	25	04	681	654
233105	AXI APACHE O	0001	10	25	04	329	386
		OPERATOR TOTAL				13,701	15,632
MACDONALD OIL CORP							
250505	SCOTT A	0001	15	26	06	854	944
250605	SCOTT B	0001	05	26	06	427	462
250705	SCOTT C	0001	13	26	06	836	605
250805	SCOTT D	0001	14	26	07	545	481
		OPERATOR TOTAL				2,662	2,492
SOUTHERN UNION PRODUCTION CO							
703505	JICARILLA F	0002	33	26	04	386	533
704005	JICARILLA H	0003	19	26	04	286	343
704105	JICARILLA H	0004	19	26	04	192	265
704205	JICARILLA J	0002	35	26	05	282	351
704305	JICARILLA J	0003	26	26	05	670	797
704405	JICARILLA J	0004	26	26	05	883	1,020
704505	JICARILLA J	0005	25	26	05	-0-	-0-
704605	JICARILLA J	0006	25	26	05	437	458
710605	JICARILLA J	0007	36	26	05	834	894
713005	JICARILLA J	0011	25	26	05	960	1,186
713105	JICARILLA J	0012	35	26	05	465	860
713205	JICARILLA J	0013	36	26	05	377	532
713305	JICARILLA J	0014	35	26	05	1,065	1,268
704705	JICARILLA K	0002	11	25	05	1,786	2,603
704805	JICARILLA K	0003	01	25	05	71	134
704905	JICARILLA K	0004	02	25	05	992	1,140
705005	JICARILLA K	0005	02	25	05	1,762	2,532
705105	JICARILLA K	0006	11	25	05	-0-	-0-
705205	JICARILLA K	0007	12	25	05	1,812	1,479
705305	JICARILLA K	0008	12	25	05	1,483	1,353
705405	JICARILLA K	0009	12	25	05	-0-	-0-
714405	JICARILLA K	0010	01	25	05	306	414
715505	JICARILLA K	0013	11	25	05	-0-	-0-
715905	JICARILLA K	0014	11	25	05	2,679	-0-
716105	JICARILLA K	0015	01	25	05	1,900	1,957
601805	NAVAJO INDIAN B	0001	30	27	08		444
601905	NAVAJO INDIAN B	0002	19	27	08		415
602005	NAVAJO INDIAN B	0003	19	27	08		392
602205	NAVAJO INDIAN B	0004	30	27	08		958
602305	NAVAJO INDIAN C	0001	31	27	08		245
		OPERATOR TOTAL				19,628	22,573
		POOL TOTAL				73,853	78,767

1-26-72

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
506 Exhibit No. 7
Case No. 4628

CASE #4628
SOUTHERN UNION GAS COMPANY
EXHIBIT
PRODUCING DAYS, 1971
GAS COMPANY CONNECTIONS
SOUTH BLANCO PICTURED CLIFF POOL

PRODUCING DAYS, 1971

			Sec	Twp	Range	Jan	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
AZTEC OIL & GAS CO																		
200305	ARIZ JICARILLA	0001	35	25	04	Chart Changing Suspended 10-17-69												
200405	ARIZ JICARILLA	0002	26	25	04	31	31	24	31	27	31	20	31	23	30	31	30	340
200605	ARIZ JICARILLA	0004	36	25	04	31	31	24	31	27	31	30	31	23	30	31	30	350
200705	ARIZ JICARILLA	0005	25	25	04	31	31	24	31	27	31	30	31	31	30	31	30	358
200805	ARIZ JICARILLA	0006	36	25	04	-0-	28	20	31	22	31	30	31	31	30	30	30	314
200905	ARIZ JICARILLA	0007	26	25	04	31	31	24	31	27	31	20	31	23	30	31	30	340
201005	ARIZ JICARILLA	0008	25	25	04	31	31	24	31	27	31	30	31	31	30	31	30	358
201105	ARIZ JICARILLA	A0001	23	25	04	Disconnected 10-10-71												
201205	ARIZ JICARILLA	A0002	24	25	04	Chart Changing Suspended 11-26-68												
201305	ARIZ JICARILLA	A0003	13	25	04	31	31	24	31	27	31	30	31	31	30	31	30	358
256905	ARIZ JICARILLA	A0004	24	25	04	31	31	24	31	27	31	30	31	31	30	31	30	358
201505	ARIZ JICARILLA	B0001	04	26	05	31	31	15	31	30	31	30	26	25	20	31	9	310
201605	ARIZ JICARILLA	B0002	09	26	05	31	31	24	31	30	16	30	22	23	30	23	30	321
201705	ARIZ JICARILLA	B0003	10	26	05	30	31	24	31	30	23	30	22	23	30	31	30	335
		OPERATOR TOTAL				309	338	251	341	301	318	310	318	295	320	332	309	3,742
ABRAHAM J R																		
276505	CHARLES M	0001	07	25	03	31	31	28	31	30	31	18	31	31	30	31	30	353
277205	CHARLES M	0002	07	25	03	31	31	22	31	30	27	30	31	23	30	31	30	347
		OPERATOR TOTAL				62	62	50	62	60	58	48	62	54	60	62	60	700
CAULKINS PRODUCING CO																		
203005	BREECH	0221	13	26	07	31	31	28	31	22	31	30	31	31	30	31	29	356
203105	BREECH	0224	13	26	07	31	31	28	31	30	31	22	29	31	30	31	30	355
203505	BREECH	0283	13	26	07	31	31	28	31	30	31	30	31	31	30	15	30	349
203705	BREECH	0310	13	26	07	24	14	28	31	30	31	14	30	31	30	31	30	324
203805	BREECH	0312	18	26	06	31	31	28	31	30	31	30	23	31	30	15	30	341
203905	BREECH A	0125	08	26	06	30	31	28	24	30	23	30	31	31	30	30	29	347
204005	BREECH A	0127	08	26	06	30	31	28	31	30	23	30	31	31	30	31	30	345
204105	BREECH A	0129	09	26	06	31	31	28	31	30	31	22	-0-	-0-	-0-	-0-	14	218
204205	BREECH A	0131	09	26	06	31	31	28	31	22	31	30	31	31	30	31	26	353
204305	BREECH A	0133	10	26	06	31	31	28	31	30	23	30	31	31	30	31	30	357
204405	BREECH A	0135	10	26	06	28	31	28	31	30	31	22	29	31	30	31	30	352
204505	BREECH A	0177	09	26	06	31	31	28	31	30	23	30	31	31	30	31	30	357
204605	BREECH A	0179	09	26	06	30	31	28	31	30	23	30	31	31	30	31	30	356
204705	BREECH A	0181	10	26	06	31	31	28	23	30	31	30	31	31	30	31	30	357
204805	BREECH A	0183	10	26	06	29	31	28	23	30	31	22	30	31	17	-0-	15	287
278105	BREECH B	0123	07	26	06	26	30	28	31	30	23	30	31	31	25	31	30	346
205005	BREECH B	0220	14	26	07	31	31	28	31	22	31	30	31	31	30	31	29	356
205105	BREECH B	0281	14	26	07	31	31	28	23	30	-0-	-0-	-0-	-0-	-0-	-0-	-0-	141
205205	BREECH C	0241	14	26	06	29	29	27	31	30	31	22	30	31	30	31	27	348
205405	BREECH C	0299	14	26	06	31	31	28	31	30	18	-0-	-0-	6	17	-0-	16	208
205505	BREECH C	0301	14	26	06	16	31	28	31	30	23	30	31	31	30	31	30	342
205605	BREECH C	0328	13	26	06	31	31	27	31	30	31	30	23	31	30	15	30	340
205705	BREECH D	0185	11	26	06	31	31	28	31	30	31	22	31	31	30	31	30	357
203405	BREECH D	0237	15	26	06	31	30	28	31	22	31	30	31	31	30	31	29	355
205805	BREECH D	0239	15	26	06	31	30	28	31	30	23	30	31	31	30	31	29	355
205905	BREECH D	0345	22	26	06	28	30	26	31	22	31	30	31	31	25	31	30	346
206005	BREECH E	0049	05	26	06	31	31	28	31	30	23	30	31	31	30	31	30	357
206305	BREECH E	0081	05	26	06	31	31	28	24	30	23	30	31	31	30	31	30	350
206505	BREECH E	0083	05	26	06	31	23	28	31	30	31	30	31	31	30	31	30	357
206705	BREECH E	0085	04	26	06	31	31	28	31	30	31	30	22	31	30	15	30	340
206605	BREECH E	0087	04	26	06	31	31	28	31	30	31	30	31	31	30	15	30	349
234205	KAIME	0001	20	26	06	31	31	28	31	30	23	30	31	31	30	31	30	357
249005	REUTER	0297	15	26	06	31	31	28	31	30	18	-0-	9	31	30	31	30	300
249105	REUTER	0343	22	26	06	31	31	28	9	22	22	-0-	-0-	-0-	-0-	-0-	-0-	143
252105	STATE A	0295	16	26	06	31	31	28	31	22	31	30	31	31	30	31	29	356
252205	STATE B COM	0233	16	26	06	31	31	28	31	30	23	30	31	31	25	31	30	352
252505	STATE C COM	0235	16	26	06	31	31	28	31	30	23	30	31	31	30	31	30	357
						1,107	1,116	1,030	1,087	1,054	977	926	969	1,029	979	911	992	12,177
CONTINENTAL OIL CO		OPERATOR TOTAL																
230805	AXI APACHE J	0001	05	25	05	31	31	28	31	30	31	30	31	23	29	24	30	349
230905	AXI APACHE J	0002	05	25	05	31	31	28	31	30	31	30	31	30	23	23	30	349
231005	AXI APACHE J	0003	06	25	05	31	31	27	31	30	31	30	23	22	30	31	30	347
231105	AXI APACHE J	0004	07	25	05	31	31	27	31	30	31	30	23	23	30	31	30	348
231205	AXI APACHE J	0006	07	25	05	23	31	28	31	30	31	30	28	23	30	31	30	346
231305	AXI APACHE J	0007	08	25	05	31	31	28	31	30	31	30	31	23	30	31	30	357
231405	AXI APACHE J	0008	08	25	05	31	31	28	31	30	31	30	31	23	30	31	30	357
281305	AXI APACHE J	0010	05	25	05	31	31	28	31	30	31	30	28	23	30	31	30	354
281505	AXI APACHE J	0011	06	25	05	31	31	28	31	30	31	30	31	21	30	31	30	355
286305	AXI APACHE J	0012	05	25	05	31	31	28	31	30	31	30	31	23	30	31	30	357
231905	AXI APACHE K	0002	04	26	05	31	31	28	31	30	31	27	26	22	30	31	30	348
232005	AXI APACHE K	0003	09	26	05	31	31	28	19	30	31	30	21	30	30	31	30	342
282405	AXI APACHE K	0004	03	26	05	31	31	28	31	30	31	25	21	23	30	31	30	342

PRODUCING DAYS, 1971 (CONTINUED)

CONTINENTAL OIL CO (CONTINUED)

			Sec	Twp	Range	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
282605	AXI APACHE K	0005	10	26	05	31	31	25	19	30	31	25	21	26	22	31	30	322
232105	AXI APACHE L	0001	36	25	04	31	31	28	8	30	23	30	31	16	30	30	30	318
232205	AXI APACHE L	0002	36	25	04	23	27	28	29	30	31	22	31	31	30	31	30	339
232305	AXI APACHE L	0003	35	25	04	31	31	28	31	30	31	30	31	21	22	31	30	347
232405	AXI APACHE L	0004	26	25	04	31	30	28	12	22	31	22	31	31	30	31	30	329
232505	AXI APACHE L	0005	26	25	04	31	31	28	31	30	31	30	31	21	30	31	30	355
232605	AXI APACHE L	0006	25	25	04	31	31	28	31	30	31	30	31	22	30	31	30	356
232705	AXI APACHE M	0001	23	25	04	31	30	28	31	30	31	30	31	31	29	29	30	351
232805	AXI APACHE M	0003	13	25	04	31	31	27	31	30	31	22	31	28	30	31	30	353
232905	AXI APACHE M	0004	24	25	04	31	31	28	31	30	31	30	31	31	30	31	30	365
233005	AXI APACHE N	0001	11	25	04	31	31	28	31	30	23	30	24	30	30	31	23	342
280005	AXI APACHE N	0003	12	25	04	31	31	28	31	30	23	30	31	31	30	31	30	357
280705	AXI APACHE N	0004	12	25	04	31	31	28	31	30	23	30	31	31	30	31	28	355
280805	AXI APACHE N	0005	01	25	04	31	31	28	31	30	31	22	31	31	30	31	24	351
282805	AXI APACHE N	0006	01	25	04	23	31	28	31	30	31	30	31	23	30	31	24	343
282905	AXI APACHE N	0007	12	25	04	31	31	28	31	22	31	30	31	31	24	31	30	351
283005	AXI APACHE N	0008	02	25	04	31	31	28	31	30	23	30	31	31	30	31	30	357
233105	AXI APACHE O	0001	10	25	04	31	31	28	31	30	31	22	31	31	30	21	26	343
		OPERATOR TOTAL				937	955	862	889	914	921	877	897	866	895	927	905	10,745
MACDONALD OIL CORP																		
250505	SCOTT A	0001	15	26	06	30	31	28	31	30	31	30	31	31	22	31	27	353
250605	SCOTT B	0001	05	26	06	31	31	28	31	30	31	30	31	23	27	31	30	354
250705	SCOTT C	0001	13	26	06	31	31	28	31	30	22	30	31	31	30	31	30	356
250805	SCOTT D	0001	14	26	07	31	31	28	31	28	31	30	24	23	30	31	30	348
		OPERATOR TOTAL				123	124	112	124	118	115	120	117	108	109	124	117	1,411
SOUTHERN UNION PRODUCTION CO																		
703505	JICARILLA F	0002	33	26	04	31	31	20	31	30	23	30	23	26	30	31	30	336
704005	JICARILLA H	0003	19	26	04	29	31	28	31	30	31	22	31	31	30	31	30	355
704105	JICARILLA H	0004	19	26	04	30	31	28	31	30	24	30	31	23	30	31	30	349
704205	JICARILLA J	0002	35	26	05	31	31	28	31	30	31	30	30	22	30	31	26	321
704305	JICARILLA J	0003	26	26	05	31	31	28	31	30	31	30	23	23	30	31	30	349
704405	JICARILLA J	0004	26	26	05	24	31	28	31	30	31	30	23	22	30	31	30	341
704505	JICARILLA J	0005	25	26	05	31	31	28	25	30	23	30	15	26	17	1	-0-	257
704605	JICARILLA J	0006	25	26	05	31	31	28	25	30	23	30	23	23	30	31	30	335
710605	JICARILLA J	0007	36	26	05	31	31	28	31	30	31	30	22	22	21	31	30	338
713005	JICARILLA J	0011	25	26	05	31	31	28	31	14	31	30	18	30	30	31	30	335
713105	JICARILLA J	0012	35	26	05	31	31	28	31	30	31	30	23	22	21	31	30	339
713205	JICARILLA J	0013	36	26	05	31	31	28	31	30	31	30	23	22	21	31	30	339
713305	JICARILLA J	0014	35	26	05	31	31	28	31	30	31	21	18	30	30	31	30	342
704705	JICARILLA K	0002	11	25	05	30	29	28	31	30	31	22	31	31	30	29	30	352
704805	JICARILLA K	0003	01	25	05	31	31	28	20	30	31	30	30	30	30	31	30	352
704905	JICARILLA K	0004	02	25	05	23	31	28	31	30	31	30	30	22	30	31	30	347
705005	JICARILLA K	0005	02	25	05	31	31	28	31	30	31	22	31	31	30	31	30	357
705105	JICARILLA K	0006	11	25	05	31	29	28	31	22	31	30	31	21	-0-	4	-0-	258
705205	JICARILLA K	0007	12	25	05	31	31	28	31	30	31	30	30	23	30	31	24	350
705305	JICARILLA K	0008	12	25	05	31	27	28	31	30	31	22	30	22	4	7	30	293
705405	JICARILLA K	0009	12	25	05	28	2	17	31	30	32	30	31	23	16	2	-0-	241
714405	JICARILLA K	0010	01	25	05	31	31	28	31	22	31	21	18	30	30	31	30	334
715505	JICARILLA K	0013	11	25	05	-0-	7	28	19	30	31	29	15	6	-0-	4	-0-	169
715905	JICARILLA K	0014	11	25	05	CONNECTED 11-30-71											26	26
716105	JICARILLA K	0015	01	25	05	CONNECTED 12- 7-71											19	19
601805	NAVAJO INDIAN B	0001	30	27	08	31	31	28	24	28	25	28	31	31	30	31	30	348
601905	NAVAJO INDIAN B	0002	19	27	08	31	31	28	23	30	31	24	31	31	30	31	30	351
602005	NAVAJO INDIAN B	0003	19	27	08	31	31	28	31	22	31	30	31	23	30	31	30	349
602205	NAVAJO INDIAN B	0004	30	27	08	31	31	28	23	22	31	30	31	31	30	31	30	349
602305	NAVAJO INDIAN C	0001	31	27	08	31	31	28	31	30	31	24	31	31	30	31	30	359
		OPERATOR TOTAL				815	807	765	810	790	831	775	735	708	700	698	755	9,189
		POOL TOTAL				3,353	3,402	3,070	3,313	3,237	3,220	3,056	3,096	3,000	3,063	3,147	3,078	38,037

1-26-72

1972 PRODUCING DAYS

CASE #4628
SOUTHERN UNION GAS COMPANY
8 EXHIBIT
PRODUCING DAYS, 1972
GAS COMPANY CONNECTIONS
SOUTH BLANCO PICTURED CLIFF POOL

SUC Case No. 4628

			Sec	Twp	Range	Jan. 1	Jan. 9
AZTEC OIL & GAS CO							
200305	ARIZ JICARILLA	0001	35	25	04	CHART CHANGING SUSPENDED	
200405	ARIZ JICARILLA	0002	26	25	04	7	8
200605	ARIZ JICARILLA	0004	36	25	04	7	8
200705	ARIZ JICARILLA	0005	25	25	04	7	8
200805	ARIZ JICARILLA	0006	36	25	04	7	8
200905	ARIZ JICARILLA	0007	26	25	04	7	8
201005	ARIZ JICARILLA	0008	25	25	04	7	8
201105	ARIZ JICARILLA	A0001	23	25	04	DISCONNECTED 10-10-71	
201205	ARIZ JICARILLA	A0002	24	25	04	CHART CHANGING SUSPENDED	
201305	ARIZ JICARILLA	A0003	13	25	04	7	8
256505	ARIZ JICARILLA	A0004	24	25	04	7	8
201505	ARIZ JICARILLA	B0001	04	26	05	4	8
201605	ARIZ JICARILLA	B0002	09	26	05	7	8
201705	ARIZ JICARILLA	B0003	10	26	05	7	8
		OPERATOR TOTAL				74	88
ABRAHAM J R							
276505	CHARLES M	0001	07	25	03	7	8
277205	CHARLES M	0002	07	25	03	7	7
		OPERATOR TOTAL				14	15
CAULKINS PRODUCING CO							
203005	BREECH	0221	13	26	07	7	8
203105	BREECH	0224	13	26	07	7	8
203505	BREECH	0283	13	26	07	7	8
203705	BREECH	0310	13	26	07	7	8
203805	BREECH	0312	18	26	06	7	8
203905	BREECH A	0125	08	26	06	7	8
204005	BREECH A	0127	08	26	06	7	8
204105	BREECH A	0129	09	26	06	7	8
204205	BREECH A	0131	09	26	06	7	8
204305	BREECH A	0133	10	26	06	7	8
204405	BREECH A	0135	10	26	06	7	8
204505	BREECH A	0177	09	26	06	7	8
204605	BREECH A	0179	09	26	06	7	8
204705	BREECH A	0181	10	26	06	7	4
204805	BREECH A	0183	10	26	06	7	3
278105	BREECH B	0123	07	26	06	7	8
205005	BREECH B	0220	14	26	07	7	8
205105	BREECH B	0281	14	26	07	-0-	-0-
205205	BREECH C	0241	14	26	06	7	8
205405	BREECH C	0299	14	26	06	7	8
205505	BREECH C	0301	14	26	06	7	5
205605	BREECH C	0328	13	26	06	7	8
205705	BREECH D	0185	11	26	06	7	4
203405	BREECH D	0237	15	26	06	7	8
205805	BREECH D	0239	15	26	06	7	8
205905	BREECH D	0345	22	26	06	7	8
206005	BREECH E	0049	05	26	06	7	8
206305	BREECH E	0081	05	26	06	7	8
206505	BREECH E	0083	05	26	06	7	8
206705	BREECH E	0085	04	26	06	7	8
206605	BREECH E	0087	04	26	06	7	8
234205	KAIME	0001	20	26	06	7	8
249005	REUTER	0297	15	26	06	7	8
249105	REUTER	0343	22	26	06	-0-	-0-
252105	STATE A	0295	16	26	06	4	-0-
252205	STATE B COM	0233	16	26	06	7	8
252505	STATE C COM	0235	16	26	06	7	8
		OPERATOR TOTAL				242	256
CONTINENTAL OIL CO							
230805	AXI APACHE J	0001	05	25	05	7	8
230905	AXI APACHE J	0002	05	25	05	7	8
231005	AXI APACHE J	0003	06	25	05	7	8
231105	AXI APACHE J	0005	07	25	05	7	8
231205	AXI APACHE J	0006	07	25	05	7	8
231305	AXI APACHE J	0007	08	25	05	7	8
231405	AXI APACHE J	0008	08	25	05	7	8
281305	AXI APACHE J	0010	05	25	05	7	8
281505	AXI APACHE J	0011	06	25	05	7	8
286305	AXI APACHE J	0012	05	25	05	7	8
231905	AXI APACHE K	0002	04	26	05	7	8
232005	AXI APACHE K	0003	09	26	05	7	8
282405	AXI APACHE K	0004	03	26	05	7	8

CONTINENTAL OIL CO (CONTINUED)

			Sec	Twp	Range	Jan. 1	Jan. 9
282605	AXI APACHE K	0005	10	26	05	7	8
232105	AXI APACHE L	0001	36	25	04	7	8
232205	AXI APACHE L	0002	35	25	04	7	8
232305	AXI APACHE L	0003	35	25	04	7	8
232405	AXI APACHE L	0004	26	25	04	7	-0-
232505	AXI APACHE L	0005	26	25	04	7	8
232605	AXI APACHE L	0006	25	25	04	7	4
232705	AXI APACHE M	0001	23	25	04	7	8
232805	AXI APACHE M	0003	13	25	04	7	8
232905	AXI APACHE M	0004	24	25	04	7	5
233005	AXI APACHE N	0001	11	25	04	7	8
280005	AXI APACHE N	0003	12	25	04	7	8
280705	AXI APACHE N	0004	12	25	04	7	8
280805	AXI APACHE N	0005	01	25	04	7	8
282805	AXI APACHE N	0006	01	25	04	4	8
282905	AXI APACHE N	0007	12	25	04	7	8
283005	AXI APACHE N	0008	02	25	04	7	8
233105	AXI APACHE O	0001	10	25	04	7	8
		OPERATOR TOTAL				214	233
MACDONALD OIL CORP							
250505	SCOTT A	0001	15	26	06	7	8
250605	SCOTT B	0001	05	26	06	7	8
250705	SCOTT C	0001	13	26	06	7	8
250805	SCOTT D	0001	14	26	07	7	7
		OPERATOR TOTAL				28	31
SOUTHERN UNION PRODUCTION CO							
703505	JICARILLA F	0002	33	26	04	7	8
704005	JICARILLA H	0003	19	26	04	7	8
704105	JICARILLA H	0004	19	26	04	7	8
704205	JICARILLA J	0002	35	26	05	7	8
704305	JICARILLA J	0003	26	26	05	7	8
704405	JICARILLA J	0004	26	26	05	7	8
704505	JICARILLA J	0005	25	26	05	-0-	-0-
704605	JICARILLA J	0006	25	26	05	7	8
710605	JICARILLA J	0007	36	26	05	7	8
713005	JICARILLA J	0011	25	26	05	7	8
713105	JICARILLA J	0012	35	26	05	7	8
713205	JICARILLA J	0013	36	26	05	7	8
713305	JICARILLA J	0014	35	26	05	7	8
704705	JICARILLA K	0002	11	25	05	7	8
704805	JICARILLA K	0003	01	25	05	7	8
704905	JICARILLA K	0004	02	25	05	7	8
705005	JICARILLA K	0005	02	25	05	7	8
705105	JICARILLA K	0006	11	25	05	-0-	-0-
705205	JICARILLA K	0007	12	25	05	7	8
705305	JICARILLA K	0008	12	25	05	7	8
705405	JICARILLA K	0009	12	25	05	-0-	-0-
714405	JICARILLA K	0010	01	25	05	7	8
715505	JICARILLA K	0013	11	25	05	-0-	-0-
715905	JICARILLA K	0014	11	25	05	7	-0-
716105	JICARILLA K	0015	01	25	05	7	8
601805	NAVAJO INDIAN B	0001	30	27	08		15
601905	NAVAJO INDIAN B	0002	19	27	08		15
602005	NAVAJO INDIAN B	0003	19	27	08		15
602205	NAVAJO INDIAN B	0004	30	27	08		15
602305	NAVAJO INDIAN C	0001	31	27	08		15
		OPERATOR TOTAL				147	235
		POOL TOTAL				719	858

1-26-72

BEFORE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Case No. 506 Exhibit No. 9
Case No. 4628

DAYS - AVERAGE PRESSURE - PRODUCTION

CASE #4628
SOUTHERN UNION GAS COMPANY
EXHIBIT
CONTINENTAL OIL COMPANY
SOUTHERN UNION GAS COMPANY CONNECTIONS
SOUTH BLANCO PICTURED CLIFF POOL

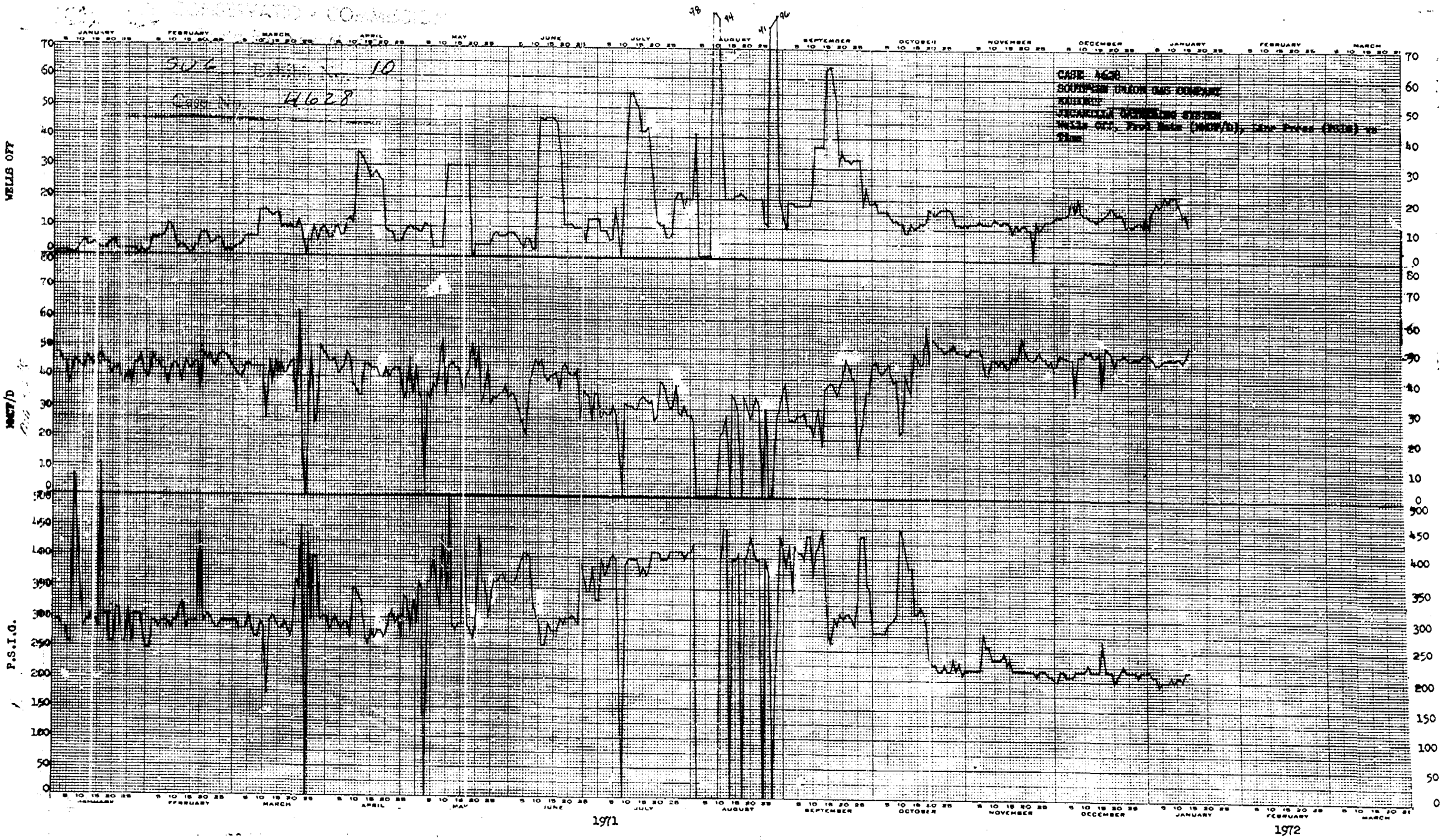
	SEPTEMBER, 1971				OCTOBER, 1971				NOVEMBER, 1971				DECEMBER, 1971				JANUARY 1, 1972				JANUARY 9, 1972			
	Well Days	Av. Pres.	MCF	MCF Per Well/Day	Well Days	Av. Pres.	MCF	MCF Per Well/Day	Well Days	Av. Pres.	MCF	MCF Per Well/Day	Well Days	Av. Pres.	MCF	MCF Per Well/Day	Well Days	Av. Pres.	MCF	MCF Per Well/Day	Well Days	Av. Pres.	MCF	MCF Per Well/Day
Lease J No. Wells - 10	234	406	9,984	43	292	337	24,265	83	295	263	24,322	82	300	256	22,768	76	70	250	5,359	77	80	245	6,305	79
Lease K No. Wells - 4	101	450	3,383	33	112	382	4,318	39	124	330	5,000	40	120	312	4,278	36	28	311	1,062	38	32	294	1,129	35
Lease L No. Wells - 6	142	418	6,250	44	172	359	7,437	43	185	288	10,795	58	180	281	7,060	39	42	277	1,616	38	36	222	2,654	46
Lease M No. Wells - 3	90	417	3,508	39	85	354	3,284	39	85	280	5,055	59	90	276	4,610	51	21	273	1,123	53	21	260	893	43
Lease N No. Wells - 7	208	405	11,769	57	204	353	15,931	78	217	276	24,528	113	189	280	15,465	82	46	274	4,212	92	56	260	5,265	94
Lease O No. Wells - 1	31	418	2,746	89	30	366	3,311	110	21	277	2,263	108	26	283	1,463	56	7	270	329	47	8	259	386	48

1-26-72

FOR THE

Exh. No. 10

Case No. 4628



1-26-72

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO

506 EXHIBIT NO. 11

CASE NO. 4628

CASE 4628
SOUTHERN UNION GAS COMPANY
SUBJECT
DOWNE CALLAWAY Pool
Wells Off, Prod Rate (MCF/D), Line Press (PSIG) vs Time

WELLS OFF

MCF/D

P.S.I.G.

1971

1972

EUGENE DIETZGEN CO. MADE IN U.S.A.
NO. 3400-T12 DIETZGEN GRAPH PAPER 1 YEAR BY DAYS

1-26-72

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
EXH. EXHIBIT NO. A5
CASE NO. 4628

CASE 4628
SOUTHERN UNION GAS COMPANY
EXHIBIT
Gathering Line Pressure vs. Distance from Compressor Station
Aircraft Guidering System
Time of Pressure Measurement:
12:00 Noon Dec. 20, 1971

EUGENE DIETZGEN CO.
MADE IN U. S. A.

NO. 340DA-20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH

PRESSURE (PSIG)

300
250
200
100

0 2 4 6 8 10 20 30

DISTANCE (MILES)

4-26-72

Santa Fe, New Mexico

Exhibit No. 14

Case No. 4628

CASE 4628
SOUTHERN UNION GAS COMPANY
EXHIBIT
Gathering Line Pressure vs Distances from Compression Station
Lovington Gathering System
Time of Pressure Measurement:
12:00 Noon Dec. 20, 1971

EUGENE DIETZGEN CO.
MADE IN U. S. A.

NO. 340A-20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH

PRESSURE (PSIG)

250
200
150
100

0 2 4 6 8 10 16 20 30

DISTANCE (MILES)

1-26-72

BEFORE
OIL CONSERVATION COMMISSION
S ntaFe, New Mexico
506 Exhibit No. 12
Case No. 4628

CASE #4628
SOUTHERN UNION GAS COMPANY
EXHIBIT
RATEABILITY OF TAKES
GAS COMPANY CONNECTIONS
SOUTH BLANCO PICTURED CLIFF POOL

	MARKET REQUIREMENTS MCF	MARKET REQUIREMENTS PERCENTAGE	ACTUAL PRODUCTION PERCENTAGE
1967			
AZTEC OIL & GAS CO.	613,954	14.96	15.4905
ABRAHAM J. R.	20,700	.51	.6393
CAULKINS OIL CO.	1,762,417	42.95	46.6892
CONTINENTIAL OIL CO.	749,153	18.26	15.4881
MacDONALD OIL CORP.	77,456	1.89	2.1620
S. U. P.	879,482	21.43	19.5709
TOTAL	4,103,162	100.00	100.0000
1968			
AZTEC OIL & GAS CO.	660,159	14.78	15.5153
ABRAHAM J. R.	20,400	.46	.4080
CAULKINS OIL CO.	2,301,282	51.52	47.2637
CONTINENTIAL OIL CO.	622,522	13.94	12.7336
MacDONALD OIL CORP.	142,685	3.20	3.4984
S. U. P.	720,091	16.10	20.5810
TOTAL	4,467,139	100.00	100.0000
1969			
AZTEC OIL & GAS CO.	444,440	12.50	12.6169
ABRAHAM J. R.	10,200	.29	.3861
CAULKINS OIL CO.	1,779,577	50.06	47.1027
CONTINENTIAL OIL CO.	384,900	10.83	13.1475
MacDONALD OIL CO.	140,241	3.94	3.1551
S. U. P.	795,448	22.38	23.5917
TOTAL	3,554,806	100.00	100.0000

Rounds as if Seeg assigns allowables w/out regard to com allowables.

SOUTH BLANCO PICTURED CLIFF POOL

1970	MARKET REQUIREMENTS MCF	MARKET REQUIREMENTS PERCENTAGE	ACTUAL PRODUCTION PERCENTAGE
AZTEC OIL & GAS CO. (Gath.)	316,340	8.90	7.9572
AZTEC OIL & GAS CO. (Gas)	128,100	3.60	3.4959
ABRAHAM J. R.	10,200	.29	.4023
CAULKINS OIL CO.	1,779,577	50.06	47.1780
CONTINENTIAL OIL CO.	384,900	10.83	12.9951
MacDONALD OIL CO.	140,241	3.94	4.1760
S. U. P.	795,448	22.38	23.7955
TOTAL	3,554,806	100.00	100.0000
1971			
AZTEC OIL & GAS CO. (Gath.)	324,771	9.23	9.1730
AZTEC OIL & GAS CO. (Gas)	191,262	5.43	4.6504
ABRAHAM J. R.	13,104	.37	.4374
CAULKINS OIL CO.	1,575,879	44.77	42.3485
CONTINENTIAL OIL CO.	504,672	14.34	14.6257
MacDONALD OIL CO.	118,608	3.37	3.4690
S. U. P.	791,714	22.49	25.2960
TOTAL	3,520,010	100.00	100.0000

DALLAS, TEXAS

1-26-72
BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
SO 6 Exhibit No. 15
Case No. 4628

NATURAL GAS PURCHASE CONTRACT

THIS AGREEMENT, made and entered into as of the 1st day of January, 1956, by and between HUMBLE OIL & REFINING COMPANY, a Texas corporation (hereinafter called "Seller"), and SOUTHERN UNION GAS COMPANY, a Delaware corporation (hereinafter called "Buyer"),

W I T N E S S E T H :

WHEREAS, Seller represents that it is the unqualified owner and holder of one or more valid and subsisting oil and gas leases or interests in leases which cover and affect the lands subject to this agreement, and that it has full power and authority to enter into this agreement so as to be binding upon Seller and its successors and assigns; and

WHEREAS, Seller by virtue of its aforesaid leases has an interest in certain wells which have been drilled and completed on the lands subject to this agreement and are capable of producing natural gas in commercial quantities from the Pictured Cliffs and deeper formations; and

WHEREAS, Seller desires to sell and Buyer desires to purchase, under the terms and conditions of and to the extent provided in this agreement, merchantable natural gas producible to Seller's interest from the existing wells and from other wells hereafter completed on the lands subject to this agreement which are capable of producing natural gas in commercial quantities:

NOW, THEREFORE, in consideration of the premises and the mutual covenants and promises herein contained, the parties heret' agree as follows:

I.

SUBJECT LANDS

The lands subject to this agreement (hereinafter referred to as the "Subject Lands"), all located in Rio Arriba and Sandoval Counties, New Mexico, and the oil and gas leasehold interests which Seller represents that it owns and holds in the various portions thereof, are set forth in Exhibits "A" and "B" annexed hereto and made a part hereof for all purposes.

II.

CONNECTION OF WELLS

Section 1. Buyer agrees to proceed, as soon as is practicable, with the construction of a gathering pipeline from a point of connection with its gas transmission system in northwestern New Mexico to a point immediately adjacent

Rio Arriba Co
New Mexico

to each of the existing wells located on the Subject Lands described in Exhibit "A" hereto, at which point same will be connected with Seller's delivery line extending from such well, or if Seller so elects, from the outlet side of Seller's field separator serving such well. Buyer will complete such gathering lines and commence the purchase of gas hereunder from each of said existing wells within ninety (90) days after the date of this contract.

Section 2. Buyer shall, at its own cost and expense, lay a similar gathering pipe line within ninety (90) days after having been requested by Seller in writing to do so, to each additional well or group of wells of Seller, whether now or hereafter drilled, on any of the Subject Lands, which shall be capable of delivering hereunder at least five hundred (500) M.C.F. of gas per day against the working pressure then being maintained by Buyer in its lines pursuant to the provisions of Article VII hereof for each mile of new gathering line required to be constructed by Buyer for the connection of such well or wells; provided, however, that Buyer shall not be required so to extend its gathering system to any well unless such well is capable of delivering hereunder against the aforesaid working pressure at least four hundred (400) M.C.F. of gas per day.

Section 3. If for any reason any well located on the Subject Lands described in Exhibit "A" hereto shall not be connected to Buyer's pipeline within ninety (90) days after Buyer is notified in writing by Seller of the completion thereof, then such well and the drilling unit upon which it is located shall, at Seller's option, be released from this contract if Seller gives Buyer written notice to such effect and Buyer fails to connect said well to its pipe line within thirty (30) days after receipt of such notice.

Section 4. If for any reason any well located on the Subject Lands described in Exhibit "B" hereto shall not be connected to Buyer's pipe line within ninety (90) days after (a) Buyer has completed construction of a gathering pipe line crossing or extending within one (1) mile of any portion of the lease block upon which the well is located, or (b) Buyer is notified in writing by Seller of the completion of such well, whichever date is the later, or, in the absence of construction of such a gathering pipe line by Buyer, within two (2) years after the date of this contract, then such well and the drilling unit upon which it is located shall, at Seller's option, be released from this contract if Seller gives Buyer written notice to

such effect and Buyer fails to connect said well to its pipeline within thirty (30) days after receipt of such notice.

III.

SALE AND PURCHASE OF GAS

Subject to the terms and conditions of this agreement, Seller will produce, sell and deliver to Buyer and Buyer will purchase, receive and pay for all natural gas lawfully produced from time to time to Seller's interest from the wells on the Subject Lands which are connected to Buyer's lines.

IV.

POINTS OF DELIVERY

The point(s) of delivery of gas hereunder shall be at the point(s) of connection between Buyer's facilities and those of Seller, and gas shall be considered delivered to and taken by Buyer at said point(s). Seller shall be responsible for the safe conduct and handling of gas until it reaches the point of delivery, at which point title to such gas, as well as the responsibility for its safe conduct and handling, shall pass to Buyer. Each party hereto shall maintain the facilities owned by it and located on the Subject Lands in good, safe, efficient operating condition and repair.

V.

UNIT OF MEASUREMENT

Section 1. The unit of measurement of natural gas for all purposes of this contract shall be one thousand (1,000) cubic feet (1 M.C.F.) of gas at a base temperature of sixty degrees Fahrenheit (60°F.) and at a base pressure of fifteen and twenty-five one-thousandths (15.025) pounds per square inch absolute, and the readings and registrations of the metering equipment herein provided for shall be computed into such units in accordance with the specifications prescribed in Gas Measurement Committee Report No. 3, dated April, 1955, of the American Gas Association, except that deviation from the Ideal Gas Laws will be considered only when the pressure of gas passing through Buyer's meters is in excess of one hundred (100) pounds per square inch gauge.

Section 2. In the measurement of gas hereunder the following factors shall be given due consideration:

(a) Having due regard for the difference in altitude and location of the various portions of the Subject Lands, it is agreed that for purposes of measurement calculations the average atmospheric pressure at all points of delivery hereunder shall be deemed to be

eleven and four-tenths (11.4) pounds per square inch.

(b) The temperature of the gas passing through Buyer's meters shall be determined by the use of recording thermometers of standard type so installed and maintained by Buyer that they may properly record the flowing temperature of the gas at each point of delivery hereunder. The arithmetical average of the temperatures recorded during each meter chart period shall be used in computing gas volumes for such period.

(c) The specific gravity of the gas delivered hereunder shall be determined by spot tests made with an Edwards type balance or by such other method as shall be agreed upon between the parties. The specific gravity of the gas delivered hereunder shall be determined at least once every ninety (90) days or at such other intervals as may be agreed to by the parties hereto as appropriate to insure accurate measurement. Each test shall determine the specific gravity to be used in computation for the measurement of natural gas delivered until the next succeeding test. Not less than fifteen (15) days prior to the making of any such test, Buyer shall give Seller written notice of the time and place thereof so that Seller, if Seller so elects, may have a representative present to observe the tests.

Section 3. It is agreed that if by reason of valid law, order or regulation, there shall be prescribed as to any gas delivered hereunder any basis for measurement or computation of gas volumes differing from that set forth above in this Article V, then the applicable prices set forth and/or provided for in Articles VIII and IX hereof shall forthwith be adjusted and corrected to compensate for the change(s) thus effected in the basis of measurement or computation of volumes of gas delivered hereunder, it being the intention of the parties that no change so effected in the basis of measurement or computation of gas volumes shall affect in any way the total price to be paid for volumes of gas delivered hereunder.

VI.

METERS

Section 1. All gas delivered to Buyer hereunder shall be measured by means of orifice meters of standard type which shall be installed, operated and maintained by Buyer together with all appurtenant field equipment necessary accurately to measure and record the volumes of gas delivered. Such meters shall be placed in

Buyer's gathering lines at points to be determined by Buyer as near as may be practicable to the respective points of delivery hereunder. From time to time and at least once in each three (3) months, the accuracy of Buyer's measuring equipment shall be verified by and at the expense of Buyer in the presence of Seller's representative(s) in the event Seller elects to have same present, and Seller's said representative(s) shall have the right to observe any adjustments which are made in such measuring equipment by Buyer. If either party at any time shall notify the other that it desires a special test of any meter, the other party shall cooperate to secure an immediate verification of the accuracy of such meter and a joint observation of any adjustment. Buyer shall give Seller not less than fifteen (15) days advance written notice of the time of all tests in order that Seller may conveniently have its representative(s) present. Reading, calibration and adjustment of Buyer's meters and the changing of charts shall be done only by Buyer. The records from Buyer's measuring equipment shall remain the property of Buyer, but upon request Buyer shall submit to Seller its records and charts, together with its calculations therefrom, for inspection and verification, subject to return by Seller within twenty (20) days after its receipt thereof. All such charts and other similar records (or microfilm copies thereof) shall be preserved by Buyer for a period of at least five (5) years.

Section 2. Buyer shall keep all meters and other measuring equipment installed by it hereunder in good operating condition. Such meters shall be kept in condition to register accurately all gas passing through same, but errors not exceeding two per cent (2%) in the registration of a meter shall not be considered as rendering the meter inaccurate within the meaning of this agreement. Following any test, metering equipment found to be inaccurate shall be immediately repaired and/or adjusted so as to reflect zero error when checked with appropriate test equipment. If for any reason a meter should become inaccurate or out of service or repair so that the amount of gas delivered through same cannot be accurately ascertained or computed by the reading thereof, the gas delivered during the period such meter is inaccurate, out of service or repair, shall be estimated and agreed upon by the parties upon the basis of the best data available, using the first of the following methods that shall be feasible:

(a) By using the registration of Seller's check meter, if one has been installed and is accurately registering, it being understood that Seller may, at its option and expense, install check meters and appurtenant equipment upstream of Buyer's measuring equipment for the purpose of checking against the registration of the meters installed by Buyer; or

(b) By correcting the error if the extent thereof is ascertainable by calibration test or mathematical calculation; or

(c) By estimating the quantity of delivery from comparison with deliveries made during preceding periods under similar conditions during which the meter was registering accurately.

Section 3. Adjustments between the parties to correct for inaccuracies in measurement shall be limited to the period during which the inaccuracy is definitely known to have existed, and if such period is not definitely ascertainable, adjustments shall be limited to a period of one-half (1/2) of the time elapsed since the date of the last calibration.

VII.

DELIVERY PRESSURE

Section 1. Except as hereinafter in this Article VII provided, Buyer shall take gas hereunder at natural well-head pressures, and shall have the right to operate its gathering system(s) to which Seller's wells on the Subject Lands are connected on such a basis as will produce a working pressure at each point of delivery up to but not exceeding six hundred (600) pounds per square inch gauge.

Section 2. As to each of the gathering systems by means of which Buyer may from time to time be purchasing gas produced from any portion of the Subject Lands, Buyer represents that it contemplates a gradual reduction in the pressure in such gathering system consistent with the decline in pressure in the reservoir from which the gas covered hereby is being produced, and agrees from time to time to lower the working pressure in such gathering system consistent with such decline in reservoir pressure to such a pressure (herein referred to as the "Maximum Gathering Pressure") as is necessary to permit at least eighty per cent (80%) of all wells producing from such reservoir at the time and connected to Buyer's said gathering system to deliver gas into such gathering system; provided, however, that Buyer shall never in any event be obligated to reduce such Maximum Gathering Pressure to less than two hundred (200) pounds per square inch gauge or be required to take or pay for gas not deliverable into Buyer's gathering system against the Maximum Gathering Pressure maintained therein from time to time in accordance with the provisions of this Article; and provided further that Seller, at its option and own expense, may at any time increase by compression the pressure of gas from any well or wells covered by this agreement so as to make same deliverable into Buyer's gathering system.

Section 3. It is further recognized by the parties hereto that when there has been a sufficient decline in the pressure of the wells connected to any

gathering system of Buyer it may be necessary for Buyer to install and operate compression facilities to increase the pressure of the gas delivered to Buyer from the wells of Seller covered hereby and from the wells of other producers connected to the same gathering system. In the event compression facilities are so installed and operated by Buyer, the price to be paid by Buyer for gas delivered hereunder shall be adjusted as provided in Section 2 of Article VIII hereof.

Section 4. The foregoing provisions of Sections 1 and 3 of this Article shall be applicable only to the production, gathering and compression of gas produced from the Subject Lands described in Exhibit "A" hereto.

VIII.

PRICE

Section 1. Subject to adjustment as provided in Section 2 of this Article and in Articles IX and XI hereof, the price to be paid by Buyer to Seller for all gas purchased by Buyer hereunder which is produced from the Pictured Cliffs Formation and/or any deeper gas horizon(s) underlying the Subject Lands described in Exhibit "A" hereto shall be as follows:

(a) Twelve Cents (12¢) per M.C.F. during the period commencing with the date of first deliveries hereunder and ending December 31, 1958;

(b) Thirteen Cents (13¢) per M.C.F. during the period commencing January 1, 1959, and ending December 31, 1963;

(c) Fourteen Cents (14¢) per M.C.F. during the period commencing January 1, 1964, and ending December 31, 1968;

(d) Fifteen Cents (15¢) per M.C.F. during the period commencing January 1, 1969, and ending December 31, 1973;

(e) Thereafter for each five (5) year period the price shall be fixed at the fair market value thereof, pressure of delivery, quality of gas, quantity of delivery, and field prices for like gas in other fields connected to Buyer's northwestern New Mexico pipe line considered, but in no event shall the price be less than Fifteen Cents (15¢) per M.C.F.

Section 2. In the event, as contemplated by Section 3 of Article VII hereof, Buyer installs compression facilities to increase the pressure of gas deliverable hereunder from one or more of Seller's wells located on the Subject Lands described in Exhibit "A" hereto, the price of all gas thereafter delivered hereunder and compressed in such facilities by Buyer shall be reduced as follows:

Maximum Gathering Pressure in pounds per square inch gauge	Reduction in Price per M.C.F.
500 or over	None
At least 400 but less than 500	3/4¢
At least 300 but less than 400	1-1/4¢
At least 200 but less than 300	1-3/4¢

Section 3. Subject to adjustment as provided in Articles IX and XI hereof, the price to be paid by Buyer to Seller for all gas purchased by Buyer hereunder which is produced from the Pictured Cliffs and/or any deeper gas horizon(s) underlying the Subject Lands described in Exhibit "B" hereto shall be as follows:

(a) Ten Cents (10¢) per M.C.F. during the period commencing with the date of first deliveries hereunder and ending December 31, 1958;

(b) Eleven Cents (11¢) per M.C.F. during the period commencing January 1, 1959, and ending December 31, 1963;

(c) Twelve Cents (12¢) per M.C.F. during the period commencing January 1, 1964, and ending December 31, 1968;

(d) Thirteen Cents (13¢) per M.C.F. during the period commencing January 1, 1969, and ending December 31, 1973;

(e) Thereafter for each five (5) year period the price shall be fixed at the fair market value thereof, pressure of delivery, quality of gas, quantity of delivery, and field prices for like gas in other fields connected to Buyer's northwestern New Mexico pipe line considered, but in no event shall the price be less than Thirteen Cents (13¢) per M.C.F.

IX.

PRICE EQUALIZATION

Any other provision in this agreement to the contrary notwithstanding, if at any time while this agreement remains in effect Buyer shall purchase at the wells in San Juan or Rio Arriba Counties, New Mexico, gas which is produced by any other(s) than Seller at a higher price (including, for this purpose, Buyer's reimbursement, if any, of tax cost to such other seller(s)) than is being paid to Seller for any portion of the gas delivered hereunder (including, for this purpose, Buyer's reimbursement, if any, of direct tax cost to Seller) and said portion of Seller's gas delivered hereunder is equivalent to or better than such other gas, giving due consideration to quality, volume and pressure, then Buyer shall pay such higher price to Seller for said portion of its gas delivered hereunder, for so long as Buyer shall pay that price to such other(s). In determining whether any higher price is being paid by Buyer for purposes of this Article the units of gas measurement shall be computed to the same pressure base and there shall be disregarded any excess of premium amounts paid or required to be paid to the holders of royalty or overriding royalty interests or paid on account of liquefiable hydrocarbon content of the gas specifically recognized.

X.

PAYMENTS

Section 1. On or before the 25th day of each calendar month, Buyer shall submit to Seller a statement showing the gas taken from each well connected under this agreement during Buyer's fiscal month immediately preceding (such fiscal month to correspond as nearly as may be practicable to the calendar month) together

with Buyer's check(s) in payment of the amount due in accordance with the provisions hereof.

Section 2. In the event any payment due hereunder shall be delinquent and Buyer shall fail to make such payment after thirty (30) days written notice by Seller to Buyer of such delinquency sent by registered mail, Seller shall have the right and option of suspending delivery of gas hereunder until all delinquent payments are made in full; provided, however, that such right of suspension shall not apply pending settlement of a bona fide dispute concerning the amount payable by Buyer if Buyer shall have made timely payment of all amounts not in dispute; and provided further that in the event any adverse claim is made against the interest of Seller or against any other interest in any gas delivered hereunder, Buyer may retain without interest any sums accruing with respect to such interest until such claim or claims shall be finally adjudicated or settled or until the person or persons against whose interest(s) any such claim is made shall furnish to Buyer adequate and satisfactory indemnity against all loss, liability, costs or damage which Buyer may suffer or incur by reason of such claim.

Section 3. In the event, pursuant to the provisions of this Article X, Seller suspends delivery of gas hereunder for a period of thirty (30) or more consecutive days, Seller, in addition to any other right or rights available to it, shall have the right to terminate this agreement at any time thereafter upon ten (10) days advance written notice to Buyer sent by registered mail, unless, prior to the giving of such notice, all delinquent payments (to the extent not in bona fide dispute) shall have been made by Buyer in full.

Section 4. Both Seller and Buyer shall have the right to examine, at reasonable times, books, records, laboratory tests, and charts of the other, to the extent necessary to verify the accuracy of any statement, test, chart, or computation made under or pursuant to any of the provisions of this agreement.

XI.

DIRECT PAYMENTS OF ROYALTIES AND TAXES

Section 1. Seller, from time to time, upon request will furnish to Buyer reasonable evidence of title, including abstracts and division orders covering all interests in the gas, but no examination, reliance or action of Buyer thereon or pursuant thereto shall alter or impair Seller's warranty of title. Buyer shall not be obligated to take notice of any change in the ownership of any of Seller's leases or of any rights therein unless and until Buyer is furnished

with a certified copy of the instrument(s) effecting such change.

Section 2. All taxes and rentals and all royalty and overriding royalty payments, if any, due as a result of Seller's ownership or operation of said leases or on account of the production, transportation and/or processing of gas before delivery to Buyer hereunder, or as a result of the sale of gas by Seller to Buyer hereunder, shall be and remain the obligations of Seller and Seller shall duly pay and discharge same, hereby agreeing to hold Buyer harmless therefrom; provided, however, that any and all increase in taxes or new taxes imposed by laws passed after the date of this agreement (except ad valorem taxes on properties and income taxes), upon or in respect of the gas up to the delivery thereof by Seller to Buyer, or upon the sale or delivery thereof by Seller to Buyer, shall be divided between and borne by the parties hereto on the basis of twenty-five per cent (25%) by Seller and seventy-five per cent (75%) by Buyer.

Section 3. All taxes, if any, due as a result of the transportation, distribution and/or sale of gas by Buyer after same passes the point(s) of delivery hereunder, shall be and remain the obligations of Buyer and Buyer shall duly pay and discharge same, hereby agreeing to hold Seller harmless therefrom.

XII.

PRORATION AND MINIMUM PURCHASES

Section 1. It is expressly recognized that Buyer may from time to time hereafter purchase and/or produce gas from other wells now or hereafter drilled in San Juan, Rio Arriba and Sandoval Counties, New Mexico, and elsewhere.

Section 2. Subject to its right under the terms of Article XV hereof to discontinue the purchase of gas from any well on the Subject Lands by reason of inadequate delivery pressure, Buyer agrees:

(a) That it will take gas from each well now or hereafter located on the Subject Lands and connected to its gathering lines at least ratably with its takings from all other wells producing from the same horizon on the Subject Lands or in the gas field in which said well is located (as such field may hereafter from time to time be enlarged and extended) which may, from time to time, be connected to Buyer's gathering lines, it being understood and agreed, however, that in complying with this ratable purchase undertaking, Buyer may prorate its withdrawals between wells on any basis which gives reasonable effect to the factors, among others, of open flow capacity, bottom hole

pressure and the size and shape of the drilling unit so long as the method of proration employed is uniformly applied by Buyer with respect to all wells on the Subject Lands and all wells in the gas field in which Seller's wells are located from which Buyer is purchasing and/or producing gas from time to time, adjustments to effect such ratable purchases to be made between wells at intervals of not longer than six (6) months; and

(b) That if at any time the quantity of gas being taken by Buyer hereunder from any of Seller's wells does not permit Seller to maintain withdrawals from the reserves covered by this contract ratably with the withdrawals from the same reservoir by others, with the result that Seller's reserves are being drained thereby and are not being protected by compensating drainage, Seller may request Buyer in writing to take increased quantities of gas from such well(s) for such time and in such amount as is necessary to offset such drainage, in which event (i) Buyer shall be obligated to purchase such increased quantities of gas to the full extent that it is capable of doing so in the light of its then existing markets, facilities and contractual obligations to other producers, and (ii) in the event Buyer fails to take such increased quantities of gas from any of Seller's wells, Seller shall have the right to have released from this contract and to sell to any other purchaser(s) such volumes of gas from said well(s) of Seller as may be necessary to offset such drainage;

provided, however, that whenever the production of gas from any of Seller's wells covered by this agreement is limited by proration order(s) issued by the New Mexico Oil Conservation Commission or any successor regulatory authority having jurisdiction, Buyer shall be deemed as to the well(s) affected by such proration order(s) to have complied in full with all obligations imposed upon it by the terms of this Section (including its obligation to protect Seller's reserves from drainage) if during each proration period Buyer takes a sufficient volume of gas from each such well of Seller that none of such well's allowable is cancelled for under-production.

Section 3. Buyer agrees in any event (unless prevented from doing so (a) by reason of the inability of Seller's wells to produce and deliver gas in sufficient quantities into Buyer's pipe line against the Maximum Gathering Pressure effective at the time or (b) by reason of the proration of withdrawals from Seller's wells pursuant to any order or orders of the New Mexico Oil Con-

servation Commission or any successor regulatory authority having jurisdiction) that, during each full calendar year that this agreement remains in effect, commencing with the first full calendar year after date of first deliveries hereunder, it will purchase (or pay for to the extent not in fact taken) from each well on the Subject Lands then connected to its gathering lines at least six (6) times the average amount of gas taken monthly from said well during the months of December of the calendar year immediately preceding, and January and February of the current calendar year.

XIII.

QUALITY OF GAS

Section 1. All gas delivered hereunder shall be reasonably free from moisture and other objectionable liquid or solid substances, shall not contain per one hundred (100) cubic feet more than one-quarter (1/4) grain of hydrogen sulphide nor more than five (5) grains of total sulphur, and shall have a heating value of not less than 1,000 B.T.U. per cubic foot under a pressure of thirty (30) inches of mercury and at sixty degrees Fahrenheit (60° F.).

Section 2. In the event Buyer refuses to take gas from any well because of improper quality for a period of thirty (30) or more consecutive days, Seller shall have the option, upon thirty (30) days advance written notice to Buyer, to have such well and the drilling unit upon which it is located released from the terms of this agreement; provided, however, that Seller shall only have such option if, prior to the giving by Seller of the notice referred to, Buyer shall not have resumed acceptance of deliveries of gas from the well.

XIV.

GASOLINE EXTRACTION

Section 1. Seller reserves the continuing right, prior to delivery of gas to Buyer hereunder, to remove and extract therefrom all helium, gasoline and other liquid or liquefiable hydrocarbons (i.e., propane and heavier components); provided, however, that no extractive process(es) employed by Seller shall materially reduce the pressure or volumes of gas otherwise available to Buyer hereunder, nor shall such process(es) materially alter the temperature of the flowing gas or change its characteristics as a useful fuel.

Section 2. It is further agreed that any gasoline or other content of the gas after it has passed into Buyer's lines shall become the property of Buyer without payment of any additional compensation therefor, except that in the case of "drip" gasoline from said gas which is accumulated by Buyer before

the gas passes Buyer's meters, to the extent that same may be handled to commercial advantage or to the extent that Seller's lessor(s) shall be entitled to a royalty thereon or require any particular disposition to be made thereof, Buyer shall pay Seller one-half (1/2) of the net amount received by Buyer from the sale of the "drip" gasoline so accumulated, if and to the extent that same is marketed.

XV.

DISCONNECTION OF WELLS

Section 1. The gas to be delivered hereunder shall be delivered by Seller into Buyer's lines against the pressure existing therein from time to time at the points of delivery, provided, however, that Seller shall not be required to deliver such gas at a pressure in excess of the Maximum Gathering Pressure provided for in Article VII hereof.

Section 2. Buyer in any event shall never be obligated to purchase any gas tendered for delivery at a pressure of less than two hundred (200) pounds per square inch gauge, and if Seller fails to deliver gas hereunder at at least such pressure for a period of sixty (60) or more consecutive days from any well to which Buyer's lines are connected, Buyer shall thereafter have the continuing right and option, upon thirty (30) days advance written notice to Seller, to discontinue the purchase of gas from such well and to remove and salvage its gathering line to such well and its other related facilities. Upon any such disconnection of a well by Buyer, said well and the drilling unit upon which it is located shall thereupon, and without further action on the part of either of the parties hereto, automatically be released from the coverage of this contract.

Section 3. If Buyer shall, pursuant to the provisions of Section 2 above, discontinue the purchase of gas from all wells located on the Subject Lands and connected to its lines, either party hereto shall have the further right at its option to terminate this agreement at any time thereafter upon thirty (30) days advance written notice to the other party.

Section 4. Nothing contained in this agreement shall be construed as requiring either Seller or Buyer to increase, or as prohibiting either Seller or Buyer from increasing, the natural pressure of gas deliverable hereunder by installation of compression facilities or otherwise as contemplated by Article VII hereof.

XVI.

WARRANTY OF TITLE

Seller expressly warrants title to and right to sell all gas delivered by it hereunder and agrees that it will hold Buyer harmless from and against any and all adverse claims thereto or encumbrances thereon.

XVII.

RIGHT OF WAY

Section 1. Insofar as it may lawfully do so without impairing its own similar rights, Seller hereby grants and assigns to Buyer an easement and right of way on, over and across all the Subject Lands (and any adjoining lands in which Seller may have an oil and gas leasehold interest) for Buyer's purposes of installing, constructing, maintaining, repairing, inspecting and removing, from time to time as Buyer deems necessary, pipe lines, measuring equipment and any other facilities useful in the performance of this agreement together with the right of free ingress and egress to and from said lands for Buyer's personnel and equipment.

Section 2. All property installed or placed in or on said lands by Buyer shall, unless purchased by Seller from Buyer under the provisions of Section 3 of Article XIX hereof, remain the personal property of Buyer and shall be subject to removal by Buyer during the term of this agreement and during a reasonable time after the expiration or termination thereof.

XVIII.

PERPETUATION AND ASSIGNMENT OF LEASES

Section 1. Seller agrees to pay all lease rentals and to exercise due care and diligence to preserve and maintain in effect its leasehold rights and interests insofar as they cover and affect the Subject Lands; provided, however, that Seller shall never be precluded from abandoning any well(s) or leaseholds or allowing any lease(s) or mineral right(s) to lapse which in Seller's judgment are deemed to be unproductive, without substantial value, or unprofitable to maintain and operate further.

Section 2. Seller shall be entitled to enter into such pooling or unitization agreements with respect to its leasehold interests in the Subject Lands as Seller may deem necessary or advisable, provided either (1) that such pooling or unitization agreements are subject to and not inconsistent with Buyer's rights hereunder, or (2) that Buyer consents in writing to Seller becoming a party thereto, or (3) that Seller is required by applicable law or rule, regu-

lation or order of governmental authority to become a party thereto.

Section 3. Seller in its discretion may otherwise assign or convey any of its leasehold interests in the Subject Lands so long as such assignment or conveyance is subject to, and not inconsistent with, Buyer's rights hereunder; provided, however, no change in the ownership of such leasehold interest shall be binding upon Buyer until such time as Buyer shall have been furnished with either the original, a certified, or an acceptable photostatic copy of the instrument or instruments effecting such change in ownership.

XIX.

OPERATIONS BY SELLER

Section 1. It is agreed that Seller shall have the right to use a reasonable amount of gas produced from any well or wells on the Subject Lands in connection with Seller's field operations and drilling activities on the Subject Lands or any adjacent lands in which Seller may have a leasehold interest, as well as the right to deliver to Seller's lessor(s) any gas to which such lessor(s) may be entitled and elect to take or receive under the terms of the oil and gas lease(s) covering the Subject Lands.

Section 2. Seller shall also have the right to use gas produced from any well or wells on the Subject Lands for gas lift and/or pressure maintenance operations; provided, however, that except as expressly provided in Section 3 of this Article Seller for such purposes shall never take from any well or group of wells located on the Subject Lands described in Exhibit "B" hereto such a quantity of gas as will reduce the volumes of gas deliverable hereunder to Buyer from such well(s) to such an extent that such well or group of wells no longer is complying with the standards of quantity set forth in Section 2 of Article II hereof.

Section 3. If at any time Seller desires to divert to gas lift and/or pressure maintenance operations greater volumes of gas from any of its wells than those permitted by Section 2 of this Article, Seller shall so notify Buyer in writing and request in such notice the release by Buyer from this contract of the affected well(s) and the drilling unit(s) upon which they are located. Within thirty (30) days after receipt by Buyer of any such notice, Buyer shall notify Seller in writing whether or not Buyer, as a condition to the release of the well(s) and drilling unit(s) covered by Seller's notice, desires Seller to purchase from Buyer all or any part of the gathering lines and measurement, compression and other facilities theretofore installed by Buyer for the purpose

of purchasing gas from the well(s) sought to be released herefrom. If Buyer so elects to have any such lines or facilities purchased by Seller, Buyer shall in its said notice to Seller set forth in reasonably complete detail the book cost to Buyer (less any applicable depreciation accrued on Buyer's books) of the lines and/or other facilities to be purchased by Seller; and the affected well(s) and drilling unit(s) shall be released from this contract only after Seller (within thirty (30) days after receipt of such notice from Buyer) shall have paid to Buyer in cash a sum equal to Buyer's said net book cost. Within ten (10) days after the making of any such payment by Seller to Buyer, Buyer shall deliver to Seller such bills of sale and/or other instruments, satisfactory in form and substance to Seller, as may be necessary to convey to Seller the facilities covered by said payment. Concurrently with delivery of Buyer's reply notice to Seller if Buyer desires Seller to purchase no gathering lines or other facilities or concurrently with delivery of the bill(s) of sale referred to above if any such lines or facilities are being purchased by Seller, Buyer shall deliver to Seller such instrument(s), satisfactory in form and substance to Seller, as may be appropriate to evidence the release from this contract of the affected well(s) and drilling unit(s).

Section 4. Except insofar as expressly provided to the contrary in this agreement, Seller shall have the right at all times to operate its property free from any control by Buyer in such a manner as Seller in its sole discretion may deem advisable, including (without being limited to) the right to drill new wells, to repair and rework old wells and to abandon any well or surrender any lease when no longer deemed by Seller to be capable of producing gas in paying quantities under normal methods of operation; and provided, further, that in exercising said rights Seller shall act at all times as a reasonably prudent operator would act under similar circumstances.

XX.

WELL DATA AND TESTS

Seller shall make available to Buyer, at all reasonable times, its well logs and the pressure and volume data on all wells from which Buyer may be purchasing gas or from which it may be entitled to purchase gas hereunder. Buyer shall have the right, on due and reasonable notice to Seller, to make such tests from time to time of Seller's wells as may be desired by Buyer, but no such test shall be made which, in the opinion of Seller, is of such a nature as to make likely damage to well equipment or to the gas reservoir.

XXI.

TERM OF AGREEMENT

This agreement shall be effective from and after the date hereof, and, unless sooner terminated as hereinabove provided, shall remain in effect until December 31, 1975, and thereafter from year to year unless and until terminated as of the end of any calendar year by written notice given by either party hereto to the other at least sixty (60) days prior to the termination date fixed in such notice.

XXII.

FORCE MAJEURE

Section 1. In the event that either party hereto is rendered unable, wholly or in part, by force majeure or other causes herein specified, to carry out its obligations under this agreement, other than Buyer's obligation to make payments of amounts due hereunder for gas delivered and received, it is agreed that on such party's giving notice and reasonably full particulars of such force majeure in writing or by telegraph to the other party within a reasonable time after the occurrence of the cause relied on, then the obligations of the party giving such notice, so far as they are affected by such force majeure or other causes herein specified, shall be suspended during the continuance of any inability so caused, but for no longer period, and such cause shall so far as possible be remedied with all reasonable dispatch.

Section 2. The term "force majeure" as employed herein shall mean acts of God, strikes, lockouts or other industrial disturbances, acts of the public enemy, wars, blockades, insurrections, riots, epidemics, landslides, lightning, earthquakes, fires, storms, floods, washouts, arrests and restraints of the Government, either Federal or State, civil or military, civil disturbances, explosions, sabotage, malicious mischief, breakage or accident to machinery or lines of pipe, freezing of wells or lines of pipe, temporary failure of gas supply, inability of any party hereto to obtain necessary materials, supplies or permits, due to existing or future rules, regulations, orders, laws or proclamations of governmental authorities (both Federal and State), including both civil and military, and any other causes, whether of the kind herein enumerated or otherwise, not reasonably within the control of the party claiming suspension.

Section 3. It is understood and agreed that the settlement of strikes or other labor difficulties shall be entirely within the discretion of the party having the difficulty, and that the above requirement that any force majeure

shall be remedied with all reasonable dispatch shall not require the settlement of labor difficulties by acceding to the demands of the opposing party when such course is inadvisable in the discretion of the party having the difficulty.

XXIII.

COVENANTS TO RUN WITH THE LAND

Section 1. The covenants and provisions of this agreement shall run with the land and with the oil and gas leases and other interests, if any, of Seller in the Subject Lands, including any and all renewals and/or extensions of such leases and/or preference right leases hereafter issued on account of any thereof.

Section 2. All of such leases or interests of Seller which may be transferred or assigned by Seller, in whole or in part, to others shall remain subject to all terms and provisions of this agreement and no such transfer or assignment shall modify or enlarge the obligations or impair the rights of Buyer hereunder, it being intended that this agreement shall be construed and applied in its entirety notwithstanding any such transfer or assignment of individual leases or interests by Seller.

XXIV.

REGULATION

Subject to the provisions of Article XXV hereof, this agreement is made in contemplation of, and all provisions hereof shall be subject to all present and future laws of the State of New Mexico, and the United States, and all orders, rules and regulations of duly constituted governmental authorities having jurisdiction which are applicable to the subject matter hereof and effective from time to time.

XXV.

INTRASTATE COMMERCE

Buyer agrees that, except as expressly provided in this Article, all of the gas delivered by Seller to Buyer hereunder shall be transported, and distributed, sold and consumed solely within the State of New Mexico. If at any time during the term of this agreement Buyer desires to engage in any transportation or sale of gas delivered hereunder which will or may result in the movement thereof outside of the New Mexico state boundaries (either in Buyer's pipe lines or otherwise), Buyer shall give written notice to Seller of its said desire. For a period of ninety (90) days after receipt of such notice from Buyer (during which 90-day

period Buyer's covenant not to permit the movement in interstate commerce of any gas delivered hereunder shall continue in full force and effect), Seller upon delivery of appropriate written notice to Buyer shall have the right and option of cancelling this agreement as of a date thirty (30) days after expiration of said ninety (90) day period (during which 30-day period Buyer's covenant not to permit the movement in interstate commerce of any gas delivered hereunder shall also continue in full force and effect); provided, however, that no such cancellation notice from Seller to Buyer shall be effective unless Seller in such notice shall undertake and agree that during a period of twelve (12) months after the cancellation date specified in said notice Seller will enter into no contract with any other party or parties or otherwise take any action which will or may result in the transportation of any gas theretofore subject to this agreement to or through any state other than the State of New Mexico. If Seller shall fail to comply with said undertakings and agreement at any time within said twelve (12) month period, then such failure in compliance by Seller shall have the effect of voiding Seller's notice of cancellation and (unless Buyer by written notice to Seller shall promptly elect to the contrary) this contract, with the sole exception of the first sentence of this Article, shall thereupon be reinstated in full force and effect. If Seller fails to give Buyer proper notice of cancellation within the ninety (90) day period provided for above, Seller shall be deemed to have waived its aforesaid right of cancellation and thereafter the provisions of the first sentence of this Article shall no longer be binding upon Buyer.

XXVI.

MISCELLANEOUS

Section 1. As to all matters of construction and interpretation, this agreement shall be interpreted, construed and governed by the laws of the State of New Mexico.

Section 2. No modification of the terms and provisions of this agreement shall be or become effective except pursuant to and upon the due and mutual execution of an appropriate supplemental written contract by the parties.

Section 3. No waiver by either party of any one or more defaults by the other party in the performance of any provisions of this agreement shall operate or be construed as a waiver of any future default or defaults whether of a like or of a different character.

Section 4. Except as herein otherwise provided, any notice, request, demand, statement, or bill provided for or contemplated by this agreement, or any notice which either party may desire to give the other, shall be in writing and shall be addressed to the address of the parties hereto, as the case may be as follows:

To Seller: Humble Oil & Refining Company
P. O. Box 1600
Midland, Texas

To Buyer: Southern Union Gas Company
1104 Burt Building
Dallas 1, Texas

or to such different address as either party shall hereafter designate to the other by formal written notice. Any such notice, request, demand, statement or bill shall be deemed received by the party to whom so addressed when delivered at such address, or, if mailed postage prepaid in registered sealed cover, when deposited in the United States mail and so addressed. In the event of emergency, notice may be given by telephone or telegraph and confirmed in writing delivered as aforesaid.

IN WITNESS WHEREOF, this agreement is executed in several counterparts, each of which shall be deemed an original, all as of the day and year first above written.

APPROVED

HUMBLE OIL & REFINING COMPANY

By _____
~~Vice President~~
DIRECTOR IN CHARGE
PRODUCTION DEPARTMENT

SELLER

ATTEST:

_____
Asst Secretary

SOUTHERN UNION GAS COMPANY

By _____
Vice President

BUYER

ATTEST:

_____
Asst Secretary

STATE OF Texas)
)
COUNTY OF Harris)

On this 27th day of February, 1956, before me appeared _____ RALPH J. SCHILTHUIS, to me personally known, who, being by me duly sworn did say that he is the Director in Charge Prod. Dept. ~~President~~ of HUMBLE OIL & REFINING COMPANY, and that the seal affixed to the foregoing instrument is the corporate seal of said corporation and that said instrument was signed and sealed in behalf of said corporation by authority of its Board of Directors, and said _____ Humble Oil & Refining Co. acknowledged said instrument to be the free act and deed of said corporation.

IN WITNESS WHEREOF, I have set my hand and seal of office on this 27th day of February, 1956.

My Commission Expires:
6-1-57

Virgil E. Cammack
Notary Public in and for _____ County, Harris

VIRGIL E. CAMMACK
Notary Public,
Harris County, Texas

STATE OF TEXAS)
)
COUNTY OF DALLAS)

On this 6th day of March, 1956, before me appeared J. C. Reid, to me personally known, who, being by me duly sworn did say that he is the Vice President of SOUTHERN UNION GAS COMPANY, and that the seal affixed to the foregoing instrument is the corporate seal of said corporation and that said instrument was signed and sealed in behalf of said corporation by authority of its Board of Directors and said J. C. Reid acknowledged said instrument to be the free act and deed of said corporation.

IN WITNESS WHEREOF, I have set my hand and seal of office on this 6th day of March, 1956.

My Commission Expires:
June 1, 1957

Marjorie L. Rose
Notary Public in and for
Dallas County, Texas

EXHIBIT "A"

To Natural Gas Purchase Contract dated as of January 1, 1956, between Humble Oil & Refining Company, as Seller, and Southern Union Gas Company, as Buyer.

Township 25 North, Range 4 West, N.M.P.M.

All of Sections 1, 2, 3, 4, 9, 10, 11, 12, 13, 14, 23, 24, 25, 26, 35 and 36

Township 25 North, Range 5 West, N.M.P.M.

All of Sections 5, 6, 7 and 8

Township 26 North, Range 4 West, N.M.P.M.

An undivided one-half interest in all of Sections 15, 16, 21, 22, 27, 28, 33 and 34

Township 26 North, Range 5 West, N.M.P.M.

All of Sections 3, 4, 9 and 10

EXHIBIT "B"

To Natural Gas Purchase Contract dated as of January 1, 1956, between Humble Oil & Refining Company, as Seller, and Southern Union Gas Company, as Buyer.

Block 1

Township 24 North, Range 4, West, N.M.P.M.

All of Sections 17, 18, 19 and 20

Block 2

Township 23 North, Range 4 West, N.M.P.M.

All of Sections 17, 18, 19 and 20; such lands, however, not to be deemed to constitute a part of the Subject Lands covered by this Contract in the event of timely exercise of the 60-day lease purchase option granted by Seller to Caswell Silver on December 30, 1955.

Township 23 North, Range 5 West, N.M.P.M.

All of Sections 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, and 18

Township 24 North, Range 5 West, N.M.P.M.

All of Sections 31 and 32; $S\frac{1}{2}$ of Section 33; $S\frac{1}{2}$ of Section 34

1971 AVERAGE PRICE

CASE #4628
SOUTHERN UNION GATHERING COMPANY
EXHIBIT?
AVERAGE PRICE *CENTS/MCF, 1971
GATHERING COMPANY CONNECTIONS
SOUTH BLANCO PICTURED CLIFF POOL

AZTEC OIL & GAS CO

			Sec	Twp	Range	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
200305	ARIZ JICARILLA	0001	35	25	04	CHART CHANGING SUSPENDED 10-17-69											
200405	ARIZ JICARILLA	0002	26	25	04	13.8	13.8	13.8	13.8	13.8	13.8	14.3	14.3	13.8	13.8	13.3	13.3
200605	ARIZ JICARILLA	0004	36	25	04									13.8			
200705	ARIZ JICARILLA	0005	25	25	04									14.3			
200805	ARIZ JICARILLA	0006	36	25	04	13.3				14.3				14.3			
200905	ARIZ JICARILLA	0007	26	25	04	13.8				13.8				13.8			
201005	ARIZ JICARILLA	0008	25	25	04	13.8				13.8				14.3			
201105	ARIZ JICARILLA	A0001	23	25	04	DISCONNECTED 10-10-71											
201205	ARIZ JICARILLA	A0002	24	25	04	CHART CHANGING SUSPENDED 11-26-68											
201305	ARIZ JICARILLA	A0003	13	25	04	13.8	13.8	13.8	13.8	13.8	14.3	14.3	14.3	14.3	13.8	13.8	13.3
256905	ARIZ JICARILLA	A0004	24	25	04	13.8	13.8	13.8	13.8	13.8	13.8					13.3	
201505	ARIZ JICARILLA	B0001	04	26	05	14.3	14.3	14.3	14.3	14.3	14.3					13.8	
201605	ARIZ JICARILLA	B0002	09	26	05	13.8	13.8	13.8	13.8	13.8	14.3					13.8	
201705	ARIZ JICARILLA	B0003	10	26	05	13.8	13.8	13.8	13.8	14.3	14.3	14.3	14.3	14.3	14.3	13.8	13.8
		OPERATOR TOTAL															
ABRAHAM J R																	
276505	CHARLES M	0001	07	25	03	13.8	13.8	13.8	13.8	13.8	13.8	14.3	14.3	13.8	13.8	13.3	13.3
277205	CHARLES M	0002	07	25	03	13.8	13.8	13.8	13.8	13.8	13.8	14.3	14.3	14.3	13.8	13.3	13.3
		OPERATOR TOTAL															
CAULKINS PRODUCING CO																	
203005	BREECH	0221	13	26	07	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
203105	BREECH	0224	13	26	07												
203505	BREECH	0283	13	26	07												
203705	BREECH	0310	13	26	07												
203805	BREECH	0312	18	26	06												
203905	BREECH A	0125	08	26	06												
204005	BREECH A	0127	08	26	06												
204105	BREECH A	0129	09	26	06												
204205	BREECH A	0131	09	26	06												
204305	BREECH A	0133	10	26	06												
204405	BREECH A	0135	10	26	06												
204505	BREECH A	0177	09	26	06												
204605	BREECH A	0179	09	26	06												
204705	BREECH A	0181	10	26	06												
204805	BREECH A	0183	10	26	06												
278105	BREECH B	0123	07	26	06												
205005	BREECH B	0220	14	26	07												
205105	BREECH B	0281	14	26	07												
205205	BREECH C	0241	14	26	06												
205405	BREECH C	0299	14	26	06												
205505	BREECH C	0301	14	26	06												
205605	BREECH C	0328	13	26	06												
205705	BREECH D	0185	11	26	06												
203405	BREECH D	0237	15	26	06												
205805	BREECH D	0239	15	26	06												
205905	BREECH D	0345	22	26	06												
206005	BREECH E	0049	05	26	06												
206305	BREECH E	0081	05	26	06												
206505	BREECH E	0083	05	26	06												
206705	BREECH E	0085	04	26	06												
206605	BREECH E	0087	04	26	06												
234205	KAIME	0001	20	26	06	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8
249005	REUTER	0297	15	26	06	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
249105	REUTER	0343	22	26	06												
252105	STATE A	0295	16	26	06												
252205	STATE B COM	0233	16	26	06												
252505	STATE C COM	0235	16	26	06	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
		OPERATOR TOTAL															
CONTINENTAL OIL CO																	
230805	AXI APACHE J	0001	05	25	05	13.8	13.8	13.8	13.8	13.8	13.8	14.3	14.3	14.3	13.8	13.3	13.3
230905	AXI APACHE J	0002	05	25	05							14.3		14.3			
231005	AXI APACHE J	0003	06	25	05							13.8		13.8			
231105	AXI APACHE J	0005	07	25	05							13.8		14.3			
231205	AXI APACHE J	0006	07	25	05							14.3					
231305	AXI APACHE J	0007	08	25	05							14.3					
231405	AXI APACHE J	0008	08	25	05							13.8					
281305	AXI APACHE J	0010	05	25	05							14.3					
281505	AXI APACHE J	0011	06	25	05												
286305	AXI APACHE J	0012	05	25	05												
231905	AXI APACHE K	0002	04	26	05	14.3	14.3	14.3	14.3	14.3	14.3					13.8	13.8
232005	AXI APACHE K	0003	09	26	05	13.8	13.8	13.8	13.8	13.8	13.8					13.8	13.3
282405	AXI APACHE K	0004	03	26	05	13.8	13.8	13.8	13.8	13.8	14.3	14.3	14.3	14.3	13.8	13.8	13.8

* Rounded off to the nearest tenth.

1-26-72

BEFORE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
SU6 Exhibit No. 16
Case No. 4628

CONTINENTAL OIL CO (CONTINUED)

			Sec	Twp	Range	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
282605	AXI APACHE K	0005	10	26	05	13.8	13.8	13.8	13.8	13.8	14.3	14.3	14.3	14.3	13.8	13.8	13.8
282705	AXI APACHE K	0001	36	25	04						13.8					13.3	13.3
282805	AXI APACHE L	0002	36	25	04											13.8	
282905	AXI APACHE L	0003	35	25	04											13.3	
283005	AXI APACHE L	0004	26	25	04												
283105	AXI APACHE L	0005	26	25	04												
232605	AXI APACHE L	0006	25	25	04												
232705	AXI APACHE M	0001	23	25	04												
232805	AXI APACHE M	0003	13	25	04												
232905	AXI APACHE M	0004	24	25	04						14.3						
233005	AXI APACHE N	0001	11	25	04						13.8						13.8
280005	AXI APACHE N	0003	12	25	04												13.3
280705	AXI APACHE N	0004	12	25	04												
280805	AXI APACHE N	0005	01	25	04												
282805	AXI APACHE N	0006	01	25	04									13.8			
282905	AXI APACHE N	0007	12	25	04									14.3			
283005	AXI APACHE N	0008	02	25	04									14.3			
233105	AXI APACHE O	0001	10	25	04	13.8	13.8	13.8	13.8	13.8	13.8	14.3	14.3	14.3	13.8	13.3	13.8
		OPERATOR TOTAL															

MACDONALD OIL CORP

250505	SCOTT A	0001	15	26	06	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
250605	SCOTT B	0001	05	26	06												
250705	SCOTT C	0001	13	26	06												
250805	SCOTT D	0001	14	26	07	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
		OPERATOR TOTAL															

SOUTHERN UNION PRODUCTION CO

703505	JICARILLA F	0002	33	26	04	13.8	13.8	13.8	13.8	13.8	13.8	14.3	14.3	14.3	13.8	13.3	13.3
704005	JICARILLA H	0003	19	26	04											13.8	
704105	JICARILLA H	0004	19	26	04											13.3	
704205	JICARILLA J	0002	35	26	05						14.3					13.3	
704305	JICARILLA J	0003	26	26	05											14.3	
704405	JICARILLA J	0004	26	26	05						13.8					13.3	
704505	JICARILLA J	0005	25	26	05												
704605	JICARILLA J	0006	25	26	05												
710605	JICARILLA J	0007	36	26	05												
713005	JICARILLA J	0011	25	26	05				14.3								
713105	JICARILLA J	0012	35	26	05				13.8								
713205	JICARILLA J	0013	36	26	05												
713305	JICARILLA J	0014	35	26	05											13.8	
704705	JICARILLA K	0002	11	25	05												
704805	JICARILLA K	0003	01	25	05												
704905	JICARILLA K	0004	02	25	05												
705005	JICARILLA K	0005	02	25	05							13.8			13.3	14.3	
705105	JICARILLA K	0006	11	25	05							14.3			13.8	13.8	
705205	JICARILLA K	0007	12	25	05							13.8					
705305	JICARILLA K	0008	12	25	05							14.3			13.3	13.3	13.3
705405	JICARILLA K	0009	12	25	05			14.3									13.8
714405	JICARILLA K	0010	01	25	05			13.8		14.3							13.8
715505	JICARILLA K	0013	11	25	05	CONNECTED 2-71		13.8		13.8							13.0
715905	JICARILLA K	0014	11	25	05	CONNECTED 11-30-71											
716105	JICARILLA K	0015	01	25	05	CONNECTED 12- 7-71											
601805	NAVAJO INDIAN B	0001	30	27	08	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
601905	NAVAJO INDIAN B	0002	19	27	08												
602005	NAVAJO INDIAN B	0003	19	27	08												
602205	NAVAJO INDIAN B	0004	30	27	08												
602305	NAVAJO INDIAN C	0001	31	27	08	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
		OPERATOR TOTAL															
		POOL TOTAL															

1-26-72
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
SUG Exhibit No. 17
Case No. 4628

SOUTHERN UNION GAS COMPANY

SOUTH BLANCO PICTURED CLIFF

BASE CONTRACTS

OPERATOR	COMPANY ASSIGNED NUMBER	CONTRACT DATE	TERM	FORMATIONS COVERED
Abraham, J. R.	GP #6499	7-15-64	7-15-84 and thereafter as long as gas is or can be produced from such lands under contract	Surface thru base of Pictured Cliffs
Aztec Oil & Gas Co.	GP #9	12-12-53	12-31-75 and thereafter so long as gas is producible from any of the subject leases in commercially usable volumes	All Formations
Caulkins Oil Co.	GP #48	2- 1-64	2-1-84 and for so long thereafter as gas is or can be produced from any one or more subject wells	All thru base of Dakota, Casinghead gas produced out of Tocito Formation from wells classified as oil wells is excluded from coverage
Continental Oil Co.	GP #55	1- 1-56	12-31-75 and thereafter from year to year unless and until terminated as of the end of any calendar year by written 60 day notice by either party	Pictured Cliffs and Deeper Formations
Robert E. Mead et al (MacDonald Oil Co.)	GP #75	9-10-52	11-1-76 and thereafter until terminated by Seller or Buyer upon 12 months prior written notice specifying a termination date at or after November 1, 1976.	Pictured Cliffs and also option to buy Mesa Verde Gas
Robert E. Mead et al (MacDonald Oil Co.)	GP #76	10-17-52	11-1-76 and thereafter until terminated by Seller or Buyer upon 12 months prior written notice specifying a termination date at or after November 1, 1976.	Pictured Cliffs and also option to buy Mesa Verde Gas
Southern Union Prod. ✓	GP #4547	1- 1-61	1-1-63 and as long thereafter as gas is or can be produced from a well or proration unit on any portion of such lands under this agreement	All Formations
Southern Union Prod. ✓	GP #4572	1- 1-61	1-1-81 and so long thereafter as any of Seller's leases and or leasehold rights or any renewals or extensions thereof shall remain in force and effect	Pictured Cliffs

other wells from other operators would also use the same compressor

1-26-72
BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
SUG Exhibit No. 18
Case No. 4628

CASE 4628
SOUTHERN UNION GAS COMPANY
EXHIBIT _____
TABULATION OF PRODUCING RATES
PRIOR TO AND AFTER CLEANING

The following is a list of wells which were cleaned by Southern Union field personnel with their respective 24 hour producing rate immediately prior to and after cleaning.

WELL	LOCATION	DATE CLEANED	24 HOUR RATE BEFORE CLEANING	24 HOUR RATE AFTER CLEANING
~~* AXI APACHE J-14~~	~~1 Sec 7 T25N R5W~~	~~11-8-71~~	~~134 MCF/D~~	~~478 MCF/D~~
AXI APACHE J-1	D Sec 5 T25N R5W	11-8-71	141 MCF/D	348 MCF/D
AXI APACHE J-3	E Sec 6 T25N R5W	11-3-71	17 MCF/D	30 MCF/D
AXI APACHE J-6	P Sec 7 T25N R5W	11-3-71	19 MCF/D	32 MCF/D
* AXI APACHE N-4	D Sec12 T25N R4W	11-3-71	93 MCF/D	120 MCF/D
* AXI APACHE J-11	A Sec 6 T25N R5W	11-8-71	58 MCF/D	136 MCF/D
* AXI APACHE N-6	P Sec 1 T25N R4W	11-3-71	39 MCF/D	58 MCF/D
AXI APACHE N-1	A Sec11 T25N R4W	11-3-71	104 MCF/D	196 MCF/D
* AXI APACHE M-4	I Sec24 T25N R4W	11-4-71	82 MCF/D	96 MCF/D
AXI APACHE M-3	A Sec13 T25N R4W	11-3-71	39 MCF/D	65 MCF/D
AXI APACHE K-5	H Sec10 T26N R5W	11-4-71	52 MCF/D	73 MCF/D
AXI APACHE K-4	M Sec 3 T26N R5W	11-4-71	22 MCF/D	40 MCF/D
AXI APACHE J-5	D Sec 7 T25N R5W	11-6-71	32 MCF/D	59 MCF/D
AXI APACHE K-3	A Sec 9 T26N R5W	11-7-71	69 MCF/D	76 MCF/D
AXI APACHE J-8	P Sec 8 T25N R5W	11-3-71	4 MCF/D	13 MCF/D

* Intermitter clock alsc wound.

EUGENE DIETZGEN CO.
MADE IN U. S. A.
NO. 340DA-20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH

CASE 4628
Southern Union Gas Company
Exhibit
Application of [illegible] for [illegible]
Your application Your letter of [illegible]
Test Period 9-15-71 to 9-20-71

1-26-72

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Exhibit No. 12
Case No. 4628

PROD RATE (MCF/D)

100
90
80
60
50
40
30
20

Interruption
Interruption
Interruption
Interruption

0 20 40 60 80 100 120 140 160 180 200

TIME (HRS)

NO. 340GA-23 EUGENE DIETZGEN GRAPH PAPER
20 × 20 PER INCH
EUGENE DIETZGEN CO.
MADE IN U. S. A.

CASE 4628

PROD RATE (MCF/D)

0
100
200
300
400

0 20 40 60 80 100 120 140 160 180 200

TIME (HRS)

No Flow

Acidize-Flow

Shut-In

Shut-In

EUGENE DIETZGEN CO.
MADE IN U. S. A.
NO. 3400A-30 DIETZGEN GRAPH PAPER
20 X 30 PER INCH

GASP 4628

240
220
200
160
140
120
100
80

PROD RATE (MCF/D)

0 20 40 60 80 100 120 140 160

TIME (HRS)

1-26-72

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Exhibit No. 20
Case No. 4628

CASE 4628
SOUTHERN UNION GAS COMPANY
EXHIBIT
ANN APACHE J-1 D Sec 5 T 25N R 5W
Monthly Prod Rate & Meter Press vs Year
(Operator - Continental)

KE 10 YEARS BY MONTHS 47 6743
X'S LOG CYCLES
KEUFFEL & ESSER CO.

METER PRESS (PSIA)

PROD RATE (MCF/D/MO)

1000
100
10

Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

19 69 | 19 70 | 19 71 | 19 ___ | 19 ___ | 19 ___ | 19 ___ | 19 ___ | 19 ___ | 19 ___

K&E 10 YEARS BY MONTHS X 3 LOG CYCLES KEUFFEL & ESSER CO. 47 6743

CASE 4628

SOUTHERN UNION GAS COMPANY

RATTLER

ACC ACREAGE 3-2 P-Sec 5, T-25S, R-5W

Monthly Prod Rate & Meter Press vs Time

(Operator + Continental)

METER PRESS (PSIA)

PROD RATE (MCF/D/MO)

1000

100

10

Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

19 69 | 19 70 | 19 71 | 19 ____ | 19 ____ | 19 ____ | 19 ____ | 19 ____ | 19 ____ | 19 ____

K·E 10 YEARS BY MONTHS X 3 LOG CYCLES KEUFFEL & ESSER CO. 47 6743

CASE 4628

METER PRESS (PSIA)

PROD RATE (MCF/D/MO)

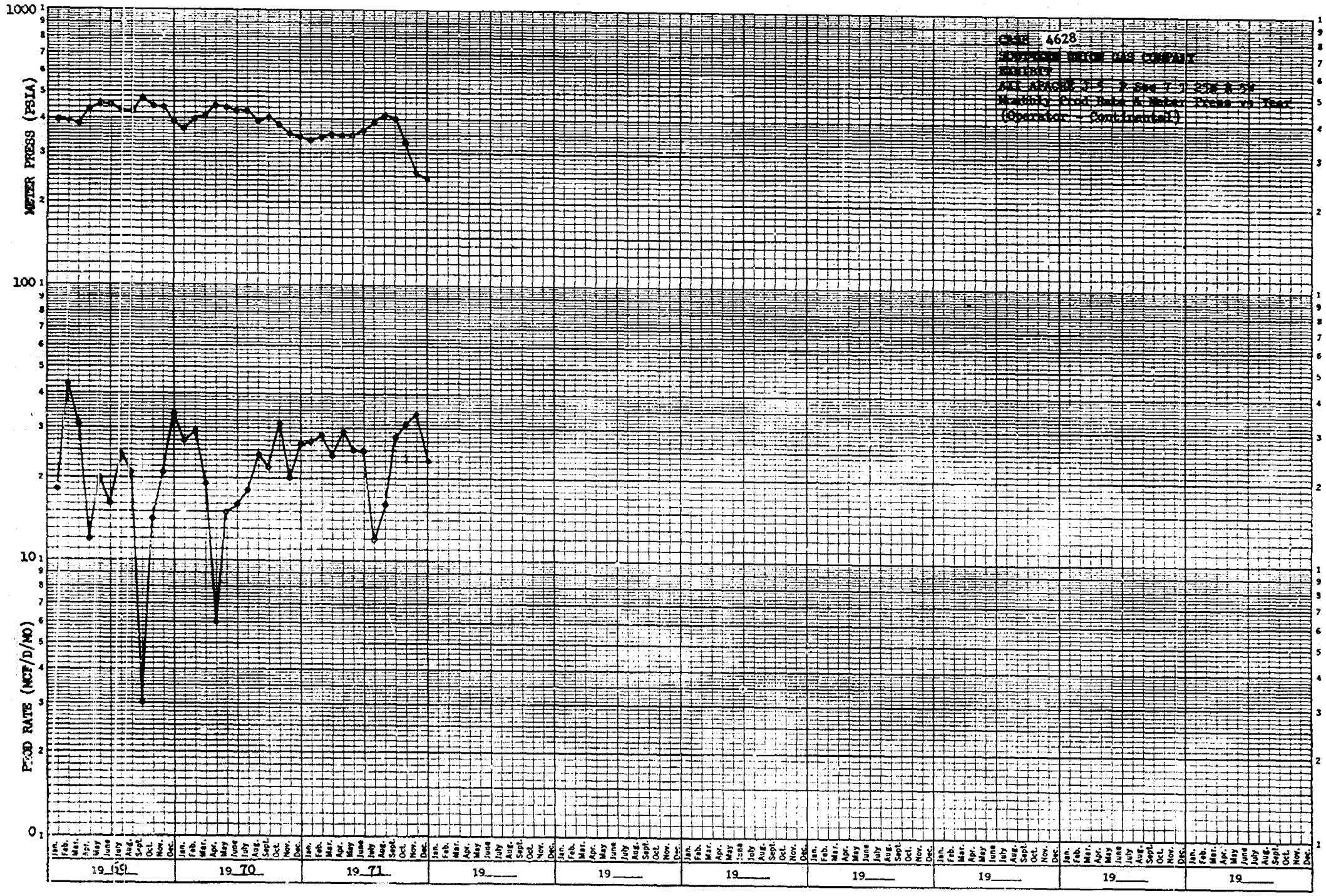
1000

100

10

19 69 | 19 70 | 19 71 | 19 | 19 | 19 | 19 | 19 | 19 | 19

K&E 10 YEARS BY MONTHS
X 3 LOG CYCLES
KEUFFEL & ESSER CO.
47 6743



K&E 10 YEARS BY MONTHS
X 3 LOG CYCLES
KEUFFEL & ESSER CO.
47 6743

CARD 4628
SOUTHERN UNION GAS COMPANY
WILDCAT
NW NW SEC 3-6S- 5 Sec 7 T 25N R 5W
Monthly Prod Rate & Recov Press vs Time
(Operator - Continental)

METER PRESS (PSIA)

1000
100

PROD RATE (MCF/D/MO)

10
0 1

Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

19 69 | 19 70 | 19 71 | 19 ___ | 19 ___ | 19 ___ | 19 ___ | 19 ___ | 19 ___ | 19 ___

CASE 4628

SOUTHERN UNION GAS COMPANY

ROBERTS

ANT APACHE J-7 D Sec 8 T 25N R 5W

Monthly Prod Rate & Meter Press vs Year

(Operator - Continental)

METER PRESS (PSIA)

PROD RATE (MCF/D/MO)

1000 100 10 0 1

Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

19 69 | 19 70 | 19 71 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19

K&E 10 YEARS BY MONTHS X 3 LOG CYCLES KEUFFEL & ESSER CO. 47 6743

CASE 4628
SOUTHERN UNION GAS COMPANY
ENERGY
ANI APACHE J-8 2 SWC 8 T 25N R 5W
Monthly Prod Rate & Meter Press vs Year
(Operator = Continental)

METER PRESS (PSIA)

PROD RATE (MM'D/MO)

1000
100
10
0

Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

19 69 | 19 70 | 19 71 | 19 | 19 | 19 | 19 | 19 | 19 | 19

K&E 10 X 10 TO 3 CYCLES 47 0743
KEUFFEL & ESSER CO.

CASE 4628

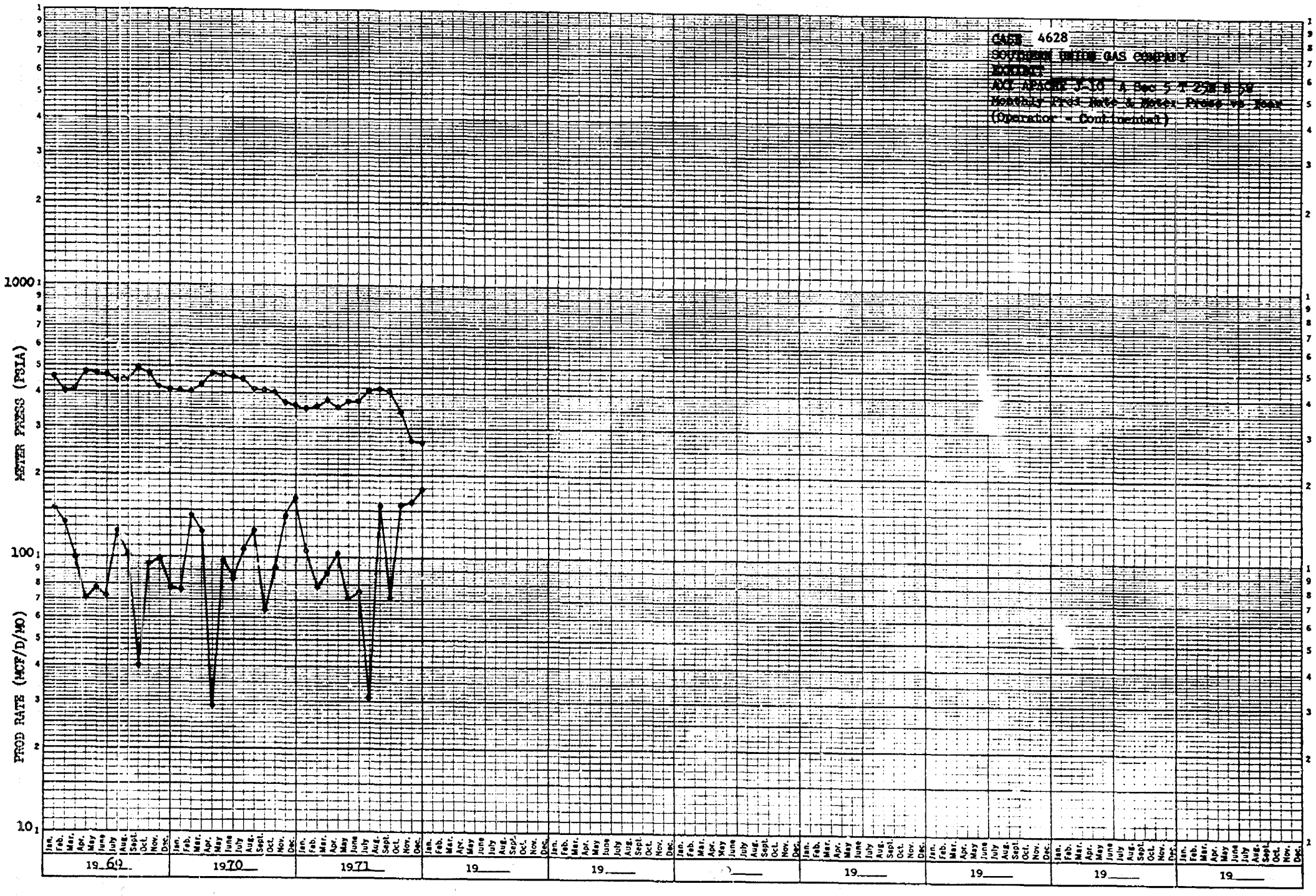
SOUTHERN UNION GAS COMPANY

ROCKET

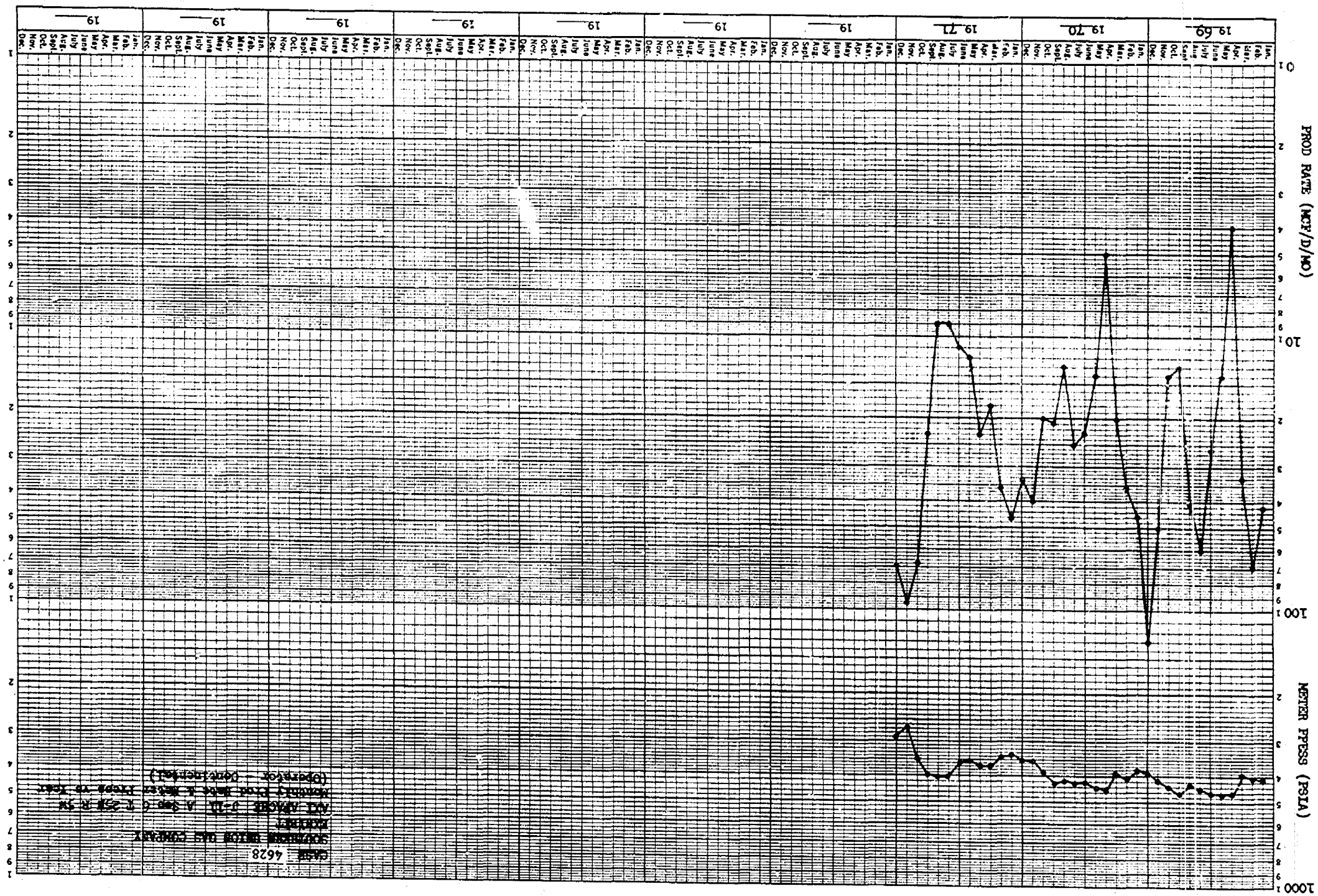
ACC APACHE 3-16 A Sec 5 T 29S R 5W

Monthly Prod Rate & Meter Press vs Time

(Operator - Confidential)



K+E 10 YEARS BY MONTHS 47 6743
X 3 LOG CYCLES
KEUFFEL & ESSER CO.


KE 10 YEARS BY MONTHS 47 6743
X 5 LOG CYCLES
KEUFFEL & ESSER CO
PROD RATE (MCF/D/MO)
METER PRESS (PSIA)
1000
100
10
1
19 69
19 70
19 71
19 72
19 73
19 74
19 75
19 76
19 77
19 78
19 79
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
CASE 4628
SOUTHERN UNION GAS COMPANY
EUNICE
ALL APACHE 8-7-11 A Sec 6 T-25N R-9W
Monthly Prod Rate & Meter Press vs Time
(Operator - Commingled)

K+E 10 YEARS BY MONTHS 47 8743
X 3 LOG CYCLES
KEUFFEL & ESSER CO.

CASE 4628
Southland Royalty Gas Company
Eumont
API #30-025-[illegible] J-12 " K Sec 5 " 25S R 37E
Monthly Prod Rate & Meter Press vs Time
(Operator - Continental)

METER PRESS (PSIA)

PROD RATE (MCF/D/MO)

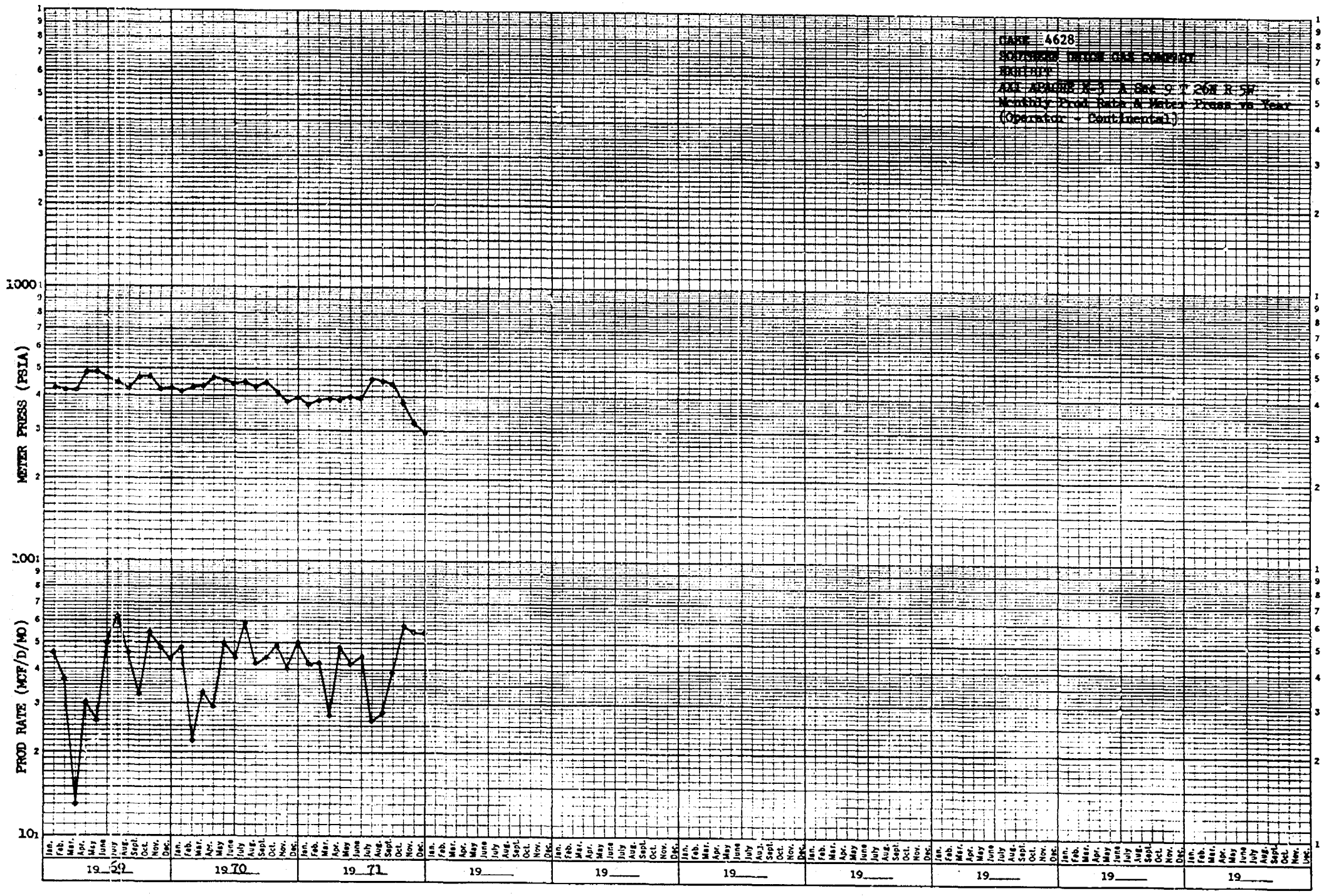
1000

100

10

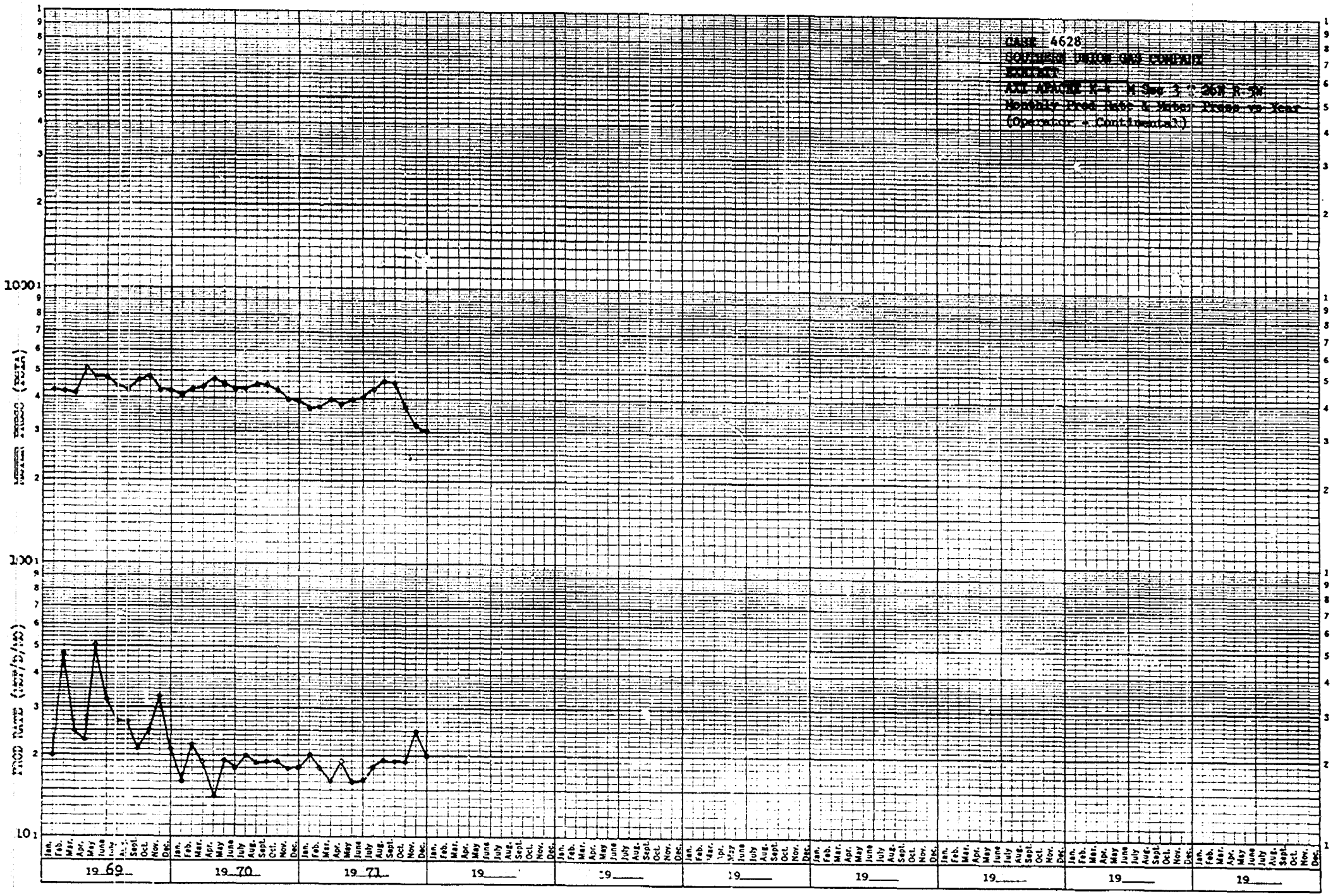
19 69	19 70	1971	19	19	19	19	19	19	19
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.	Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.	Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.	Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.	Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.	Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.	Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.	Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.	Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.	Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

CASE 4628
Southland Royalty Gas Company
Rodgers
API #2403[illegible] K-3 A Sec 9 T 26N R 5W
Monthly Prod. Rate & Meter Press vs Year
(Operator - Continental)



KOE 10 YEARS BY MONTHS X 3 LOG CYCLES KEUFFEL & ESSER CO 47 6743

CASE 4628
SOUTHERN UNION GAS COMPANY
EXHIBIT
ATT APACHE K-4 M Sec 3 26N R 5W
Monthly Prod Rate & Meter Press vs Year
(Operator + Continental)



K&E 10 YEARS BY MONTHS X 9 LOG CYCLES KEUFFEL & ESSER CO. 47 6743

CASE 4628
Southern Union Gas Company
Exhibit
Ark Apache L-X # Sec 3 T-25N R-8W
Monthly Prod Rate & Rate Press vs Year
(Operator = Continental)

K+E 10 YEARS BY MONTHS 47 6743
X 3 LOG CYCLES
KEUFFEL & ESSER CO.

METER PRESS (PSIA)

PROD RATE (MCF/D/MO)

19 69 | 19 70 | 19 71 | 19 | 19 | 19 | 19 | 19 | 19 | 19

CASE 4628

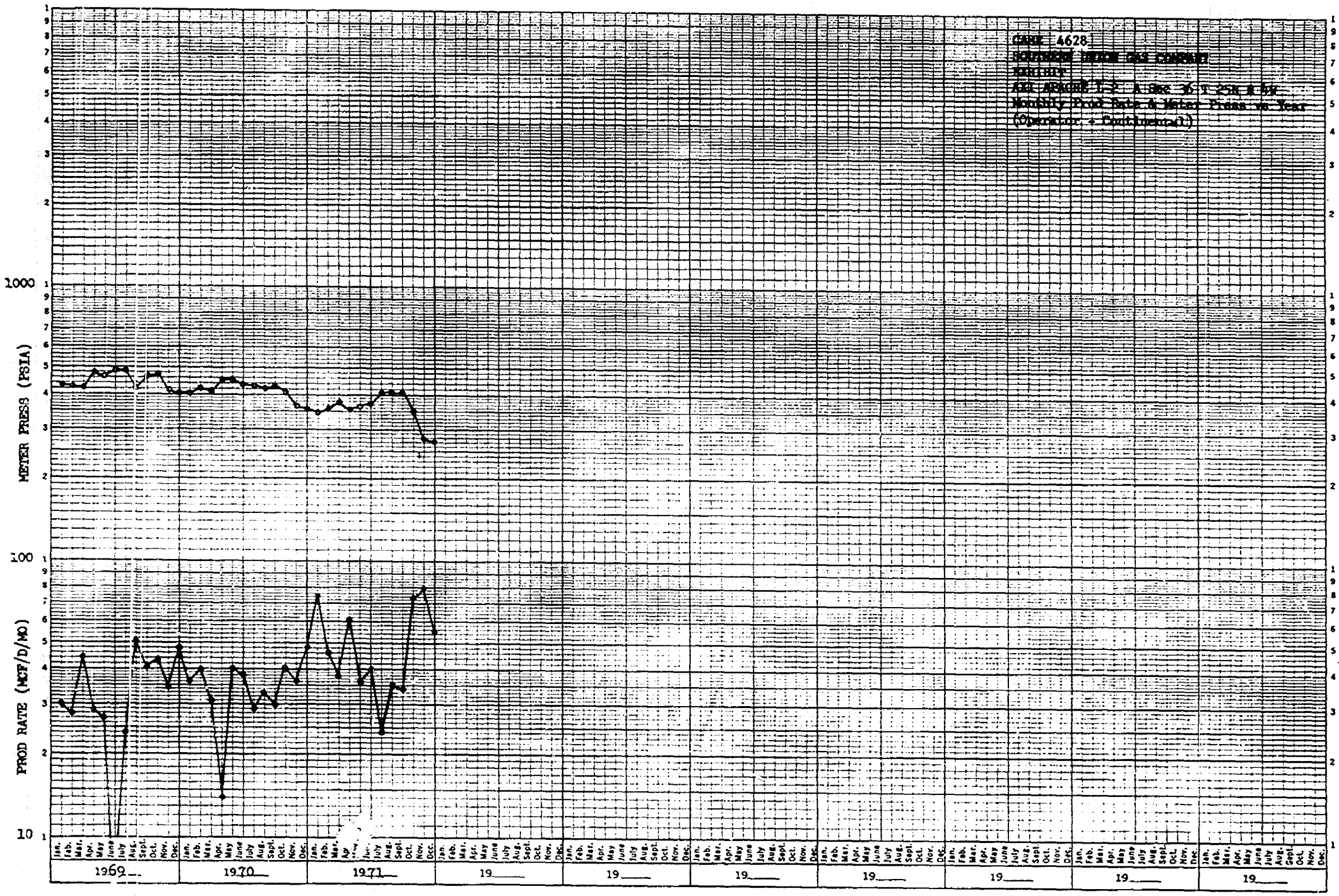
SOUTHERN UNION GAS COMPANY

ENGINEER

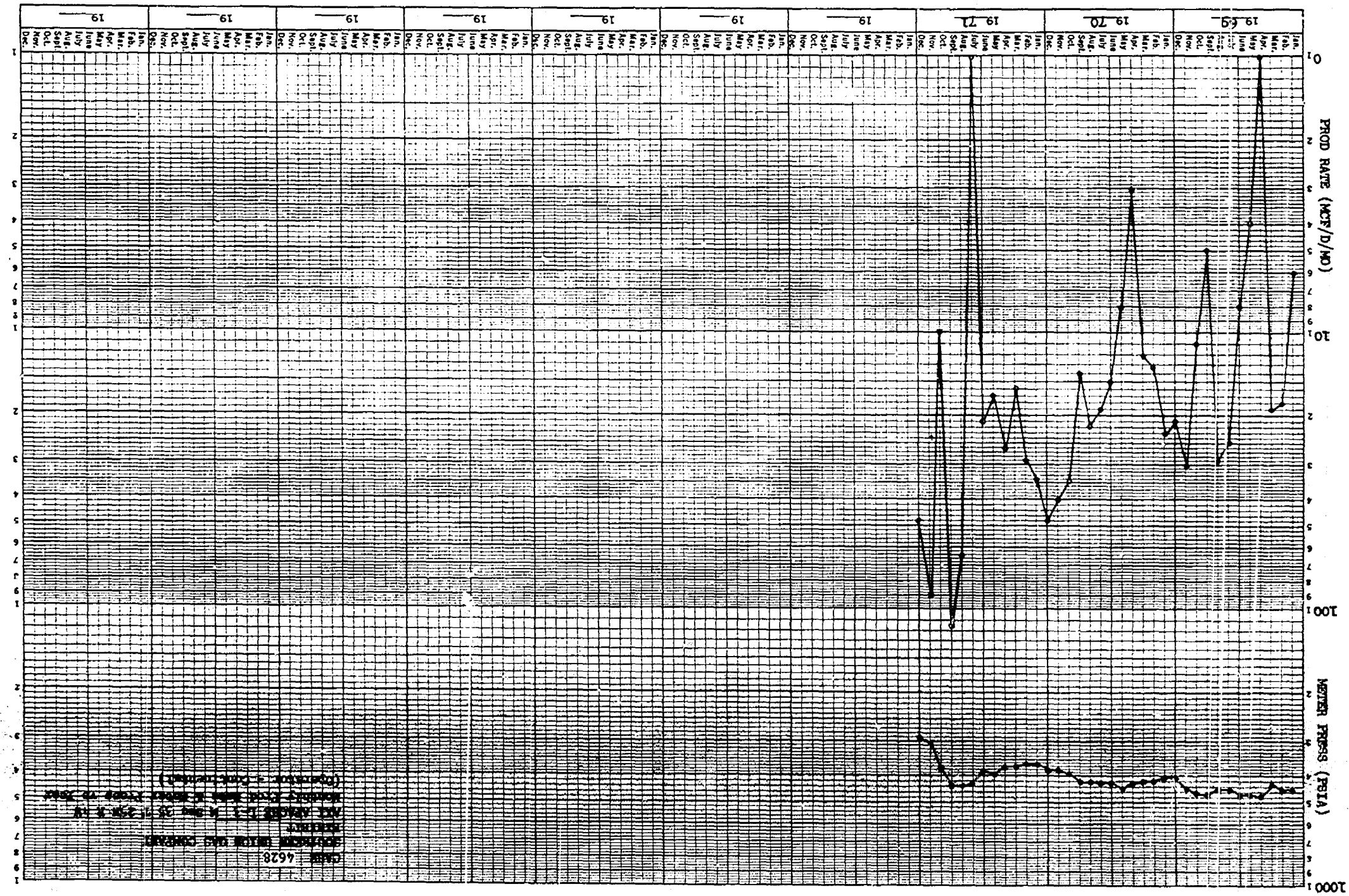
AXI APACHE L-2 A Sec 36 T 25N R 5W

Monthly Prod Rate & Meter Press vs Year

(Operator = Continental)



K&E 10 YEARS BY MONTHS 47 0743
X 5 LOG CYCLES
KEUFFEL & ESSER CO.


PROD RATE (MCF/D/MO)
METER PRESS (PSIA)
19 69
19 70
19 71
CASE 4628
SOUTHERN UNION GAS COMPANY
PANHANDLE
ALL AREAS IN T-3-N, R-24-E & R-25-E
HARDEMAN & COOKE COUNTIES, TEXAS
(Operator - Commission)
K+E 10 YEARS BY MONTHS 47 6743
X 5 LOG CYCLES
KEUFFEL & ESSER CO.

CASE 4628
SOUTHERN UNION GAS COMPANY
ANCL APACHE U-3 - N Sec 26 T 25N R 9W
Monthly Prod Rate & Meter Press vs Time
(Operator - Continental)

K&E 10 YEARS BY MONTHS 47 0743
X 3 LOG CYCLES
KEUFFEL & ESSER CO.

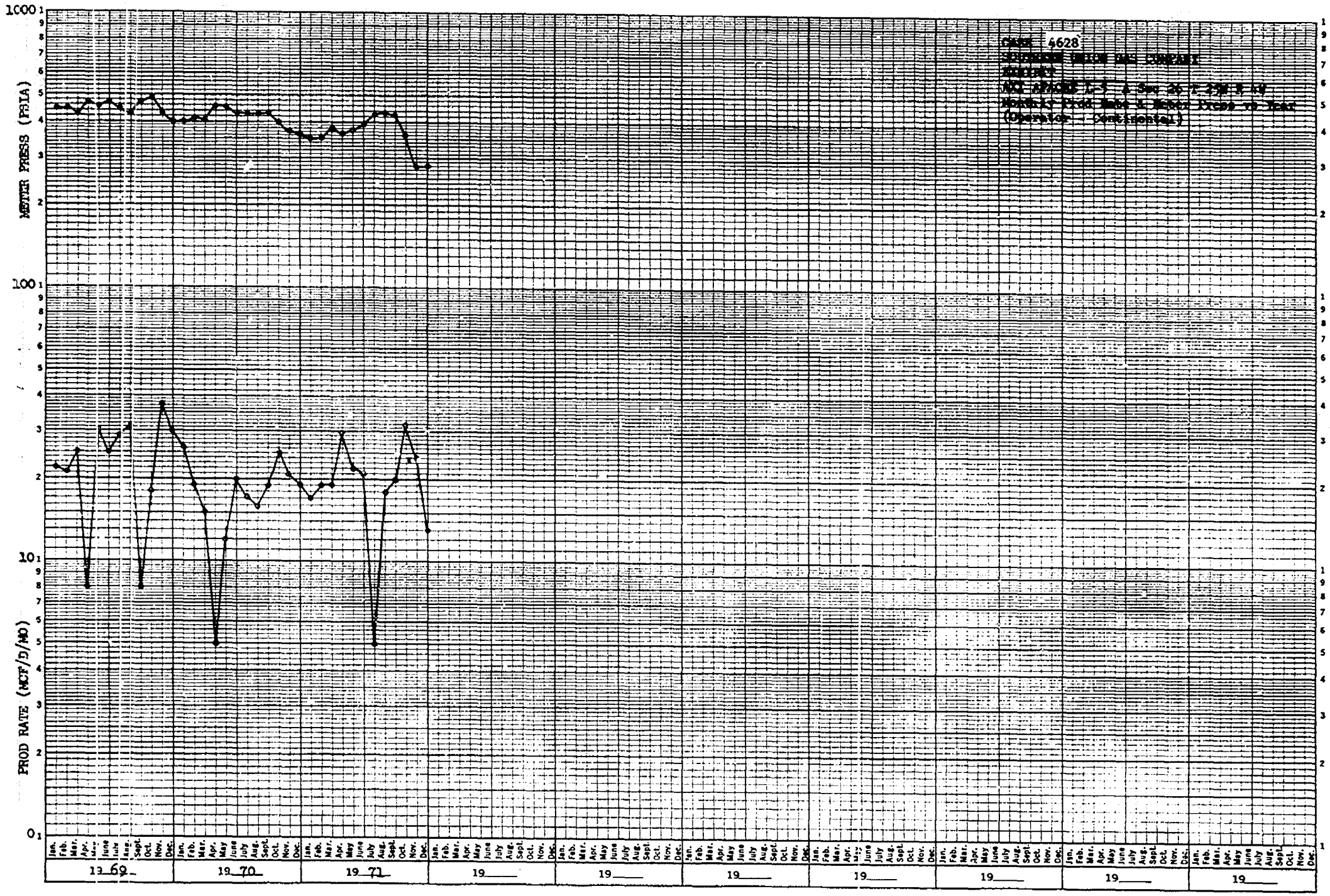
METER PRESS (PSIA)

PROD RATE (MCF/D/MO)

1000
100
10

Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

19 69 | 19 70 | 19 71 | 19 ___ | 19 ___ | 19 ___ | 19 ___ | 19 ___ | 19 ___ | 19 ___



K+E 10 YEARS BY MONTHS X 3 LOG CYCLES KEUFFEL & ESSER CO. 47 6743

K&E 10 YEARS BY MONTHS
X 3 LOG CYCLES
KEUFFEL & ESSER CO.
47 6743

WATER PRESS (PSIA)

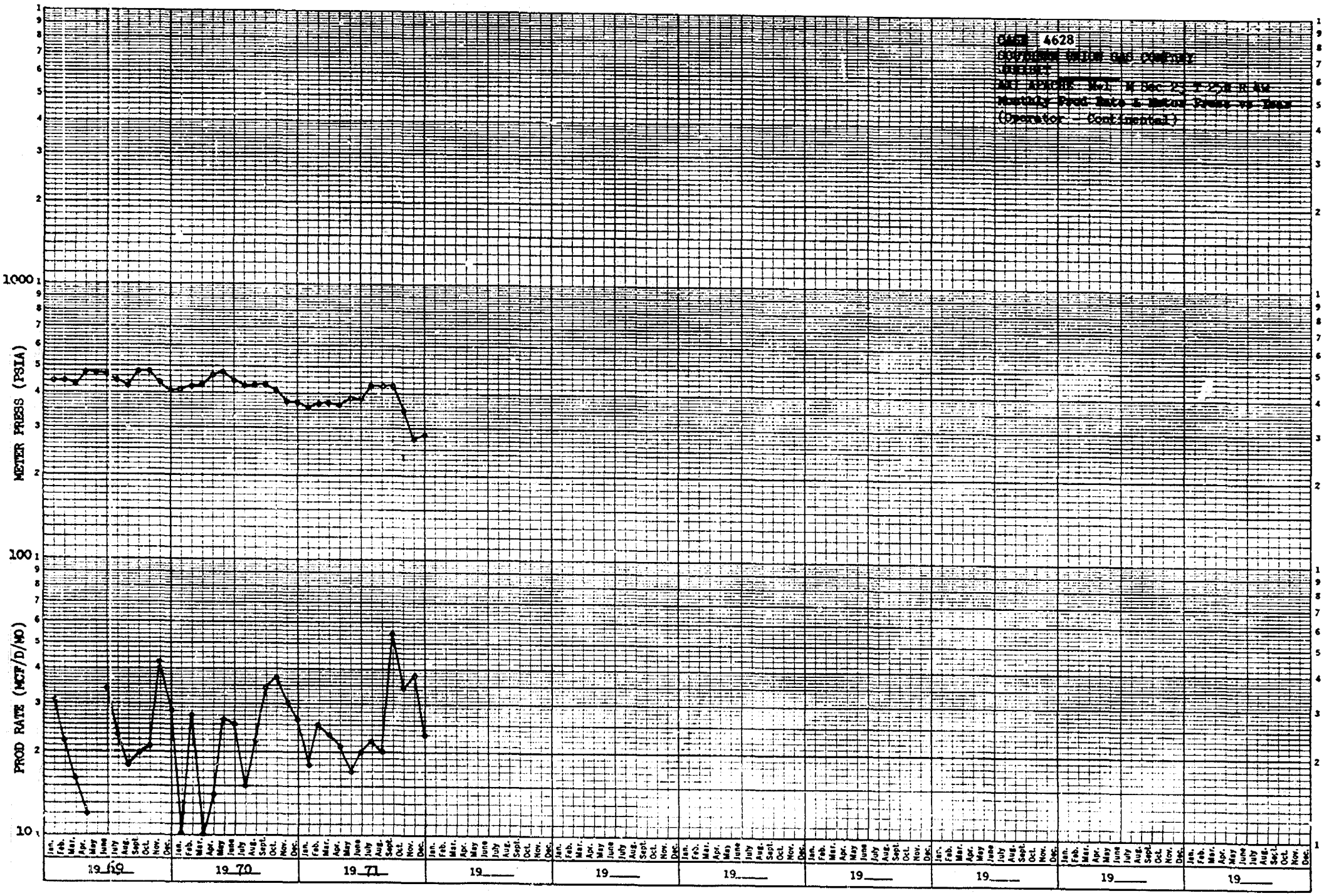
PROD RATE (MCF/D/MO)

1000
100
10
0 1

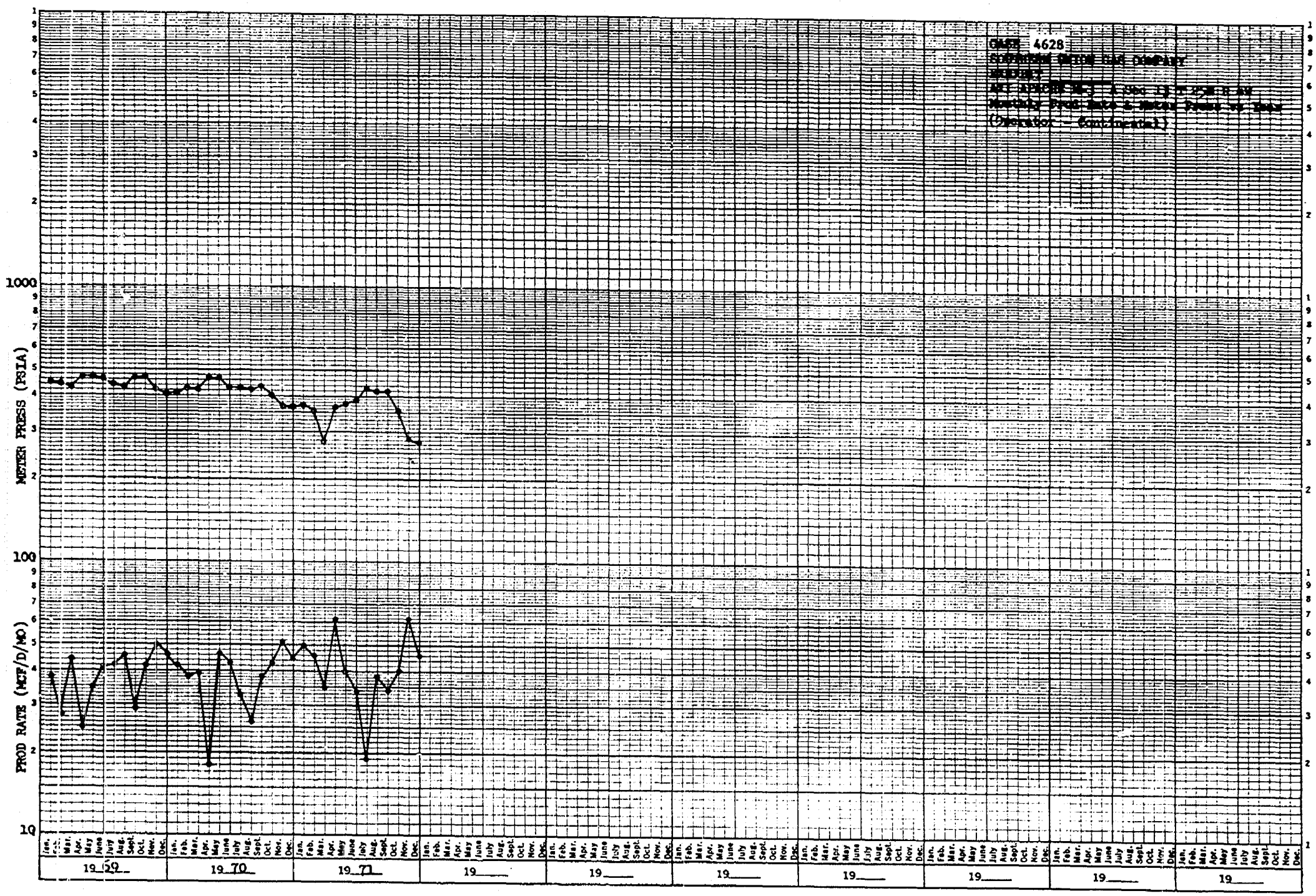
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

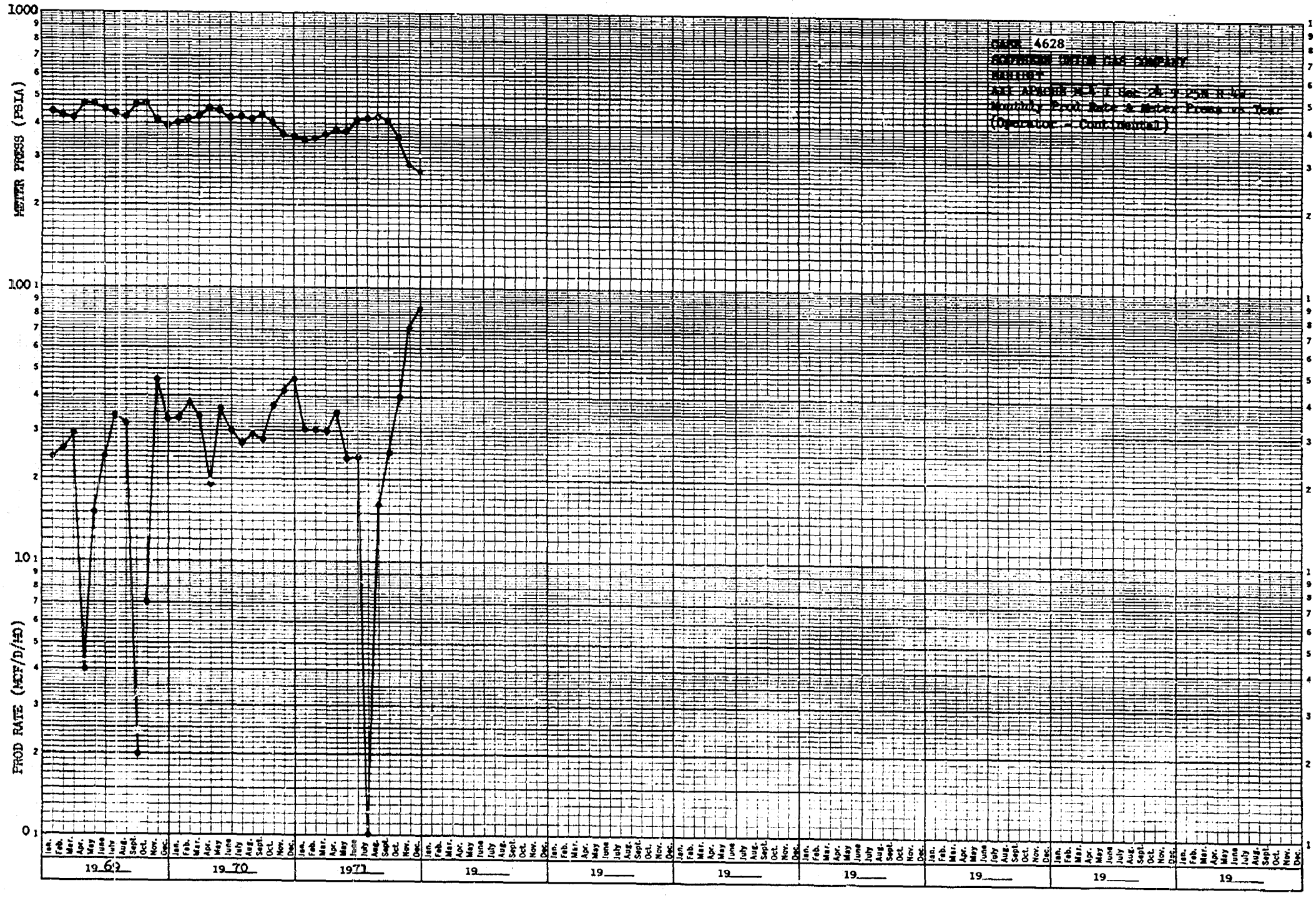
19 69 | 19 70 | 19 71 | 19 ____ | 19 ____ | 19 ____ | 19 ____ | 19 ____ | 19 ____ | 19 ____

K&E 10 YEARS BY MONTHS X 3 LOG CYCLES KEUFFEL & ESSER CO. 47 6743



K&E 10 YEARS BY MONTHS X 3 LOG CYCLES 47 6743 KEUFFEL & ESSER CO.





K•E 10 YEARS BY MONTHS X 3 LOG CYCLES KEUFFEL & ESSER CO. 47 0743

K&E 10 YEARS BY MONTHS 47 6743
X 3 LOG CYCLES
KEUFFEL & ESSER CO.

CHGE 4628
Structural datum was corrected
January
API GRAVITY F.T. A Sec 33 T 25N R 5W
Monthly Prod Rate & Meter Press vs Time
(Operator - Continental)

PROD RATE (MCF/D/MO)

METER PRESS (PSIA)

1000
100
10

Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

19 69 | 19 70 | 19 71 | 19 ____ | 19 ____ | 19 ____ | 19 ____ | 19 ____ | 19 ____ | 19 ____

KE 10 YEARS BY MONTHS 47 6743
X'S LOG CYCLE
KEUFFEL & ESSER CO.

CASE 4628

[redacted] GAS COMPANY

[redacted]

ART APACHE No. 3 1 Sec 12 T 23N R 8W

Monthly Prod. Rate & Meter Press vs Time

(Operator - Confidential)

MASTER PRESS (PSIA)

PROD RATE (MCF/D/MO)

1000

100

10

19 69 | 19 70 | 19 71 | 19 | 19 | 19 | 19 | 19 | 19 | 19

CASE 4628
SOUTHERN UNION GAS COMPANY
Caprock
API #30-005 [illegible] D Sec 12 T 25S R 32E
Monthly Prod Rate & Meter Press vs Time
(Operator - Continental)

METER PRESS (PSIA)

PROD RATE (MCF/D/MO)

1000

100

10

Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

19 69 | 19 70 | 19 71 | 19 ____ | 19 ____ | 19 ____ | 19 ____ | 19 ____ | 19 ____ | 19 ____

K+E 10 YEARS BY MONTHS 47 6743
X 3 LOG CYCLES
KEUFFEL & ESSER CO.

K&E 10 YEARS BY MONTHS 47 6743
X 3 LOG CYCLES
KEUFFEL & ESSER CO.

CASE 4628
[redacted] GAS COMPANY
[redacted]
ACK APACHE K-5 N Sec 1, T 25N R 1W
Monthly Prod Rate & Meter Press vs Time
(Operator - Confidential)

METER PRESS (PSIA)

1000 100

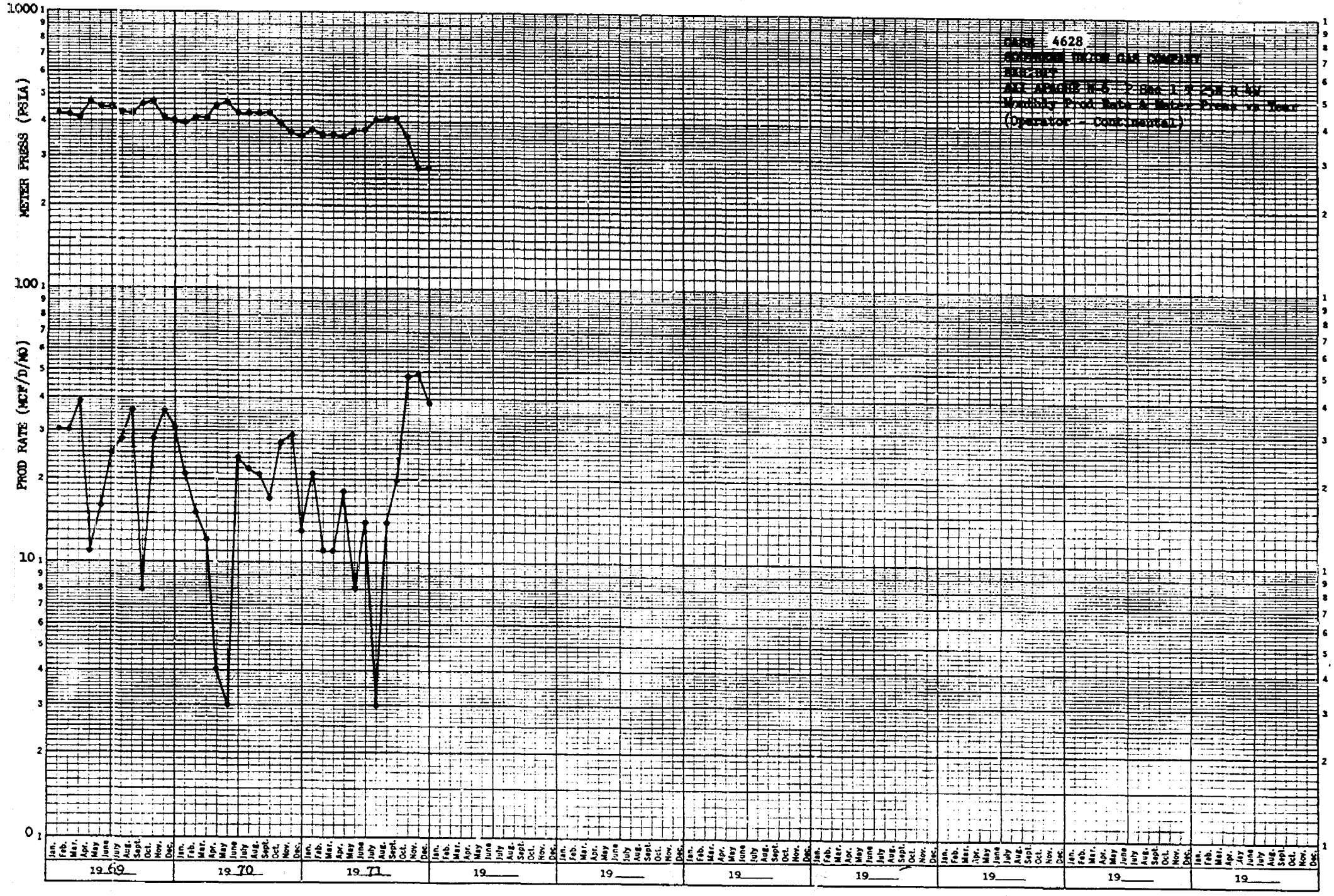
PROD RATE (MCF/D/MO)

10 0

Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

19 69 | 19 70 | 19 71 | 19 ____ | 19 ____ | 19 ____ | 19 ____ | 19 ____ | 19 ____ | 19 ____

K+E 10 YEARS BY MONTHS 47 6743
X 5 LOG CYCLES
KEUFFEL & ESSER CO.



K+E 10 YEARS BY MONTHS X 3 LOG CYCLES KEUFFEL & ESSER CO. 47 6743

Case 4628
[redacted]
Acc Aprch Dir W Sec 12 T 25N R 5W
Monthly Prod Rate & Meter Press vs Time
(Operator - Continental)

PROD RATE (MCF/D/MO)

METER PRESS (PSIA)

1000
100
10

Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

19 69 | 19 70 | 19 71 | 19 | 19 | 19 | 19 | 19 | 19 | 19

K&E 10 YEARS BY MONTHS 47 6743
X 3 LOG CYCLES
KEUFFEL & ESSER CO.

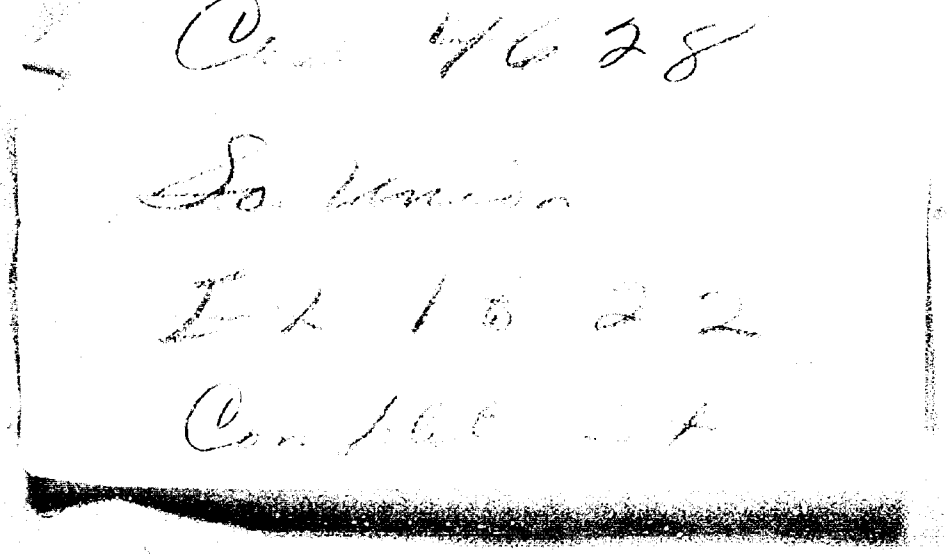
Case 4628
Southern Union Gas Company
Bonner
Act Apache B-2 Sec 2 T 25N R 4W
Permit Prod Rate & Meter Press vs Time
(Operator - Continental)

PROD RATE (MCF/D/MO)

METER PRESS (PSIA)

1000
100
10

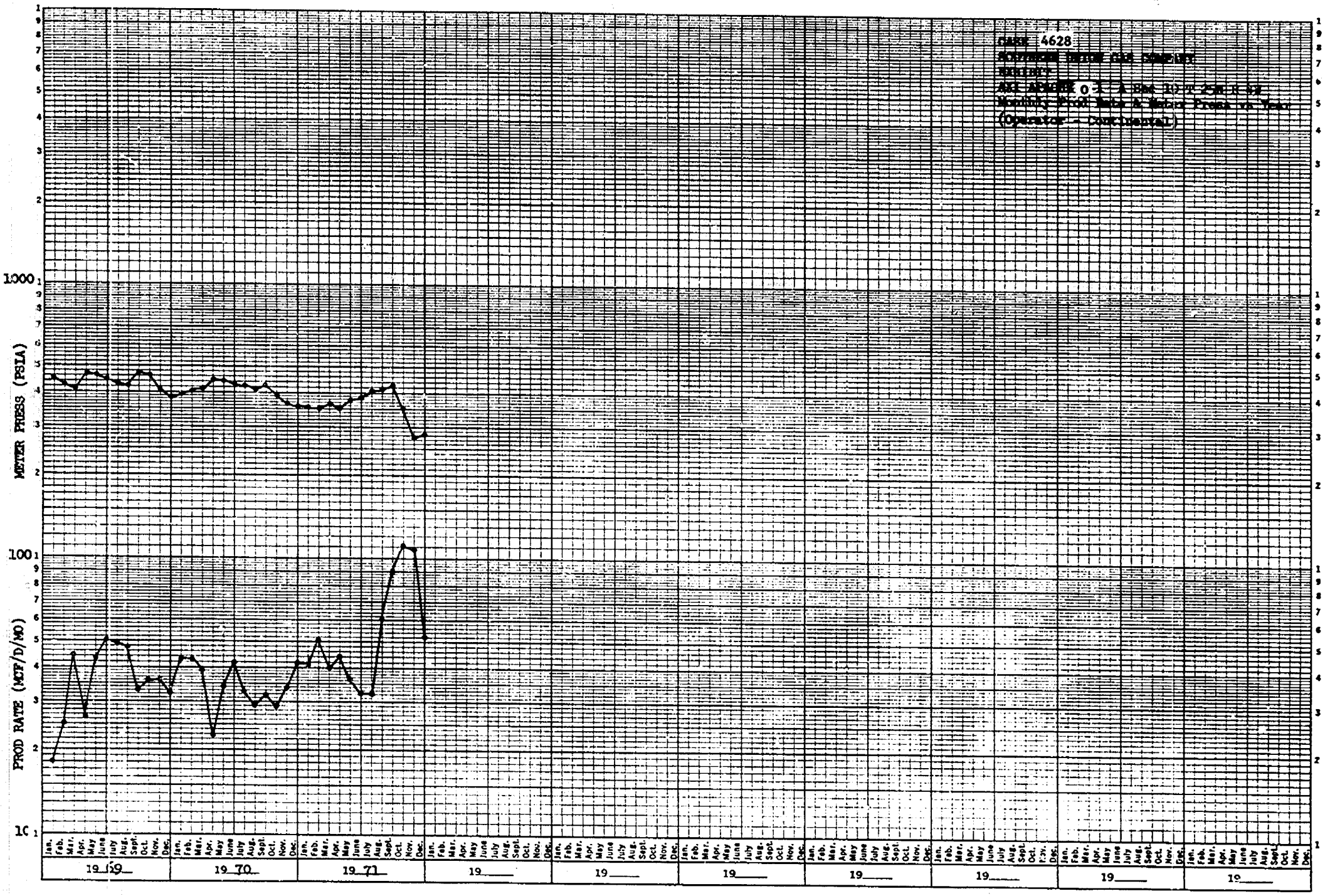
1969	1970	1971	19____	19____	19____	19____	19____	19____	19____



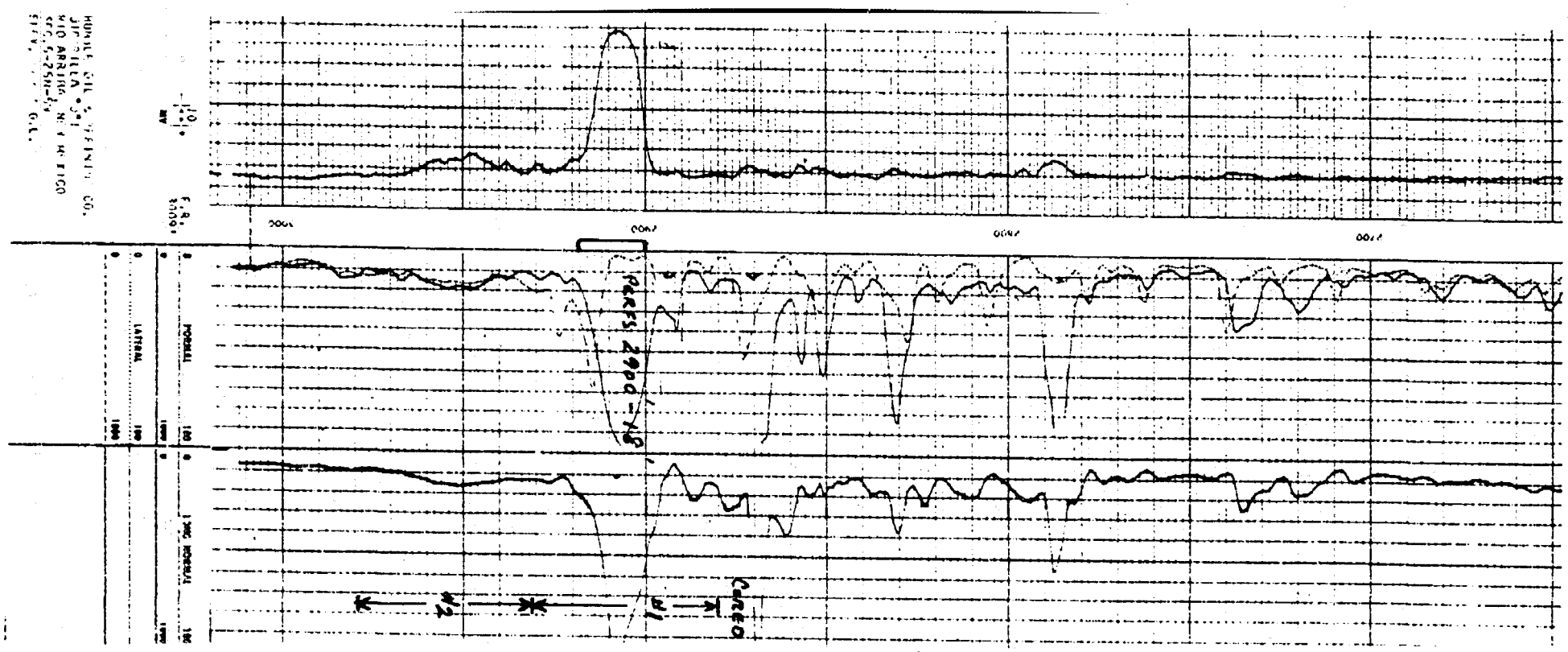
CASE 4628

Monthly Prod Rate & Meter Press vs Time

(Operator = Continental)



K&E 10 YEARS BY MONTHS X 3 LOG CYCLES KEUFFEL & ESSER CO. 47 6743



BEFORE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
CONTINENTAL OIL CO.
Exhibit No. 2
Case No. 4628

1-26-72 Hearing

EXHIBIT NO._____

NMOCC DELIVERABILITY FORMULA

$$D = Q \left(\frac{Pc^2 - Pd^2}{Pc^2 - Pw^2} \right)^{0.85}$$

D = Calculated Deliverability, MSCF/D.

Q = Integrated flow volume, MSCF/D, obtained from seven day flow period.

P_c = Seven day shut-in well head pressure, psia.

P_d = Deliverability pressure at 0.80 P_c, psia.

P_w = Static well head working pressure, psia.

Pool Slope = 0.85.

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
CONTINENTAL Exhibit No. 4
Case No. 4628
Hearing 1-26-72

EXHIBIT NO._____

SUMMARY OF SPECIAL 1971 COMPRESSOR
DELIVERABILITY TESTS & 1970 REGULAR TESTS
CONOCO AXI-APACHE WELLS
SOUTH BLANCO PICTURED CLIFFS POOL

AXI-Apache Well No.	Date	h PSIA	Pc PSIA	Q MCF/D	Pw PSIA	Pd PSIA	D MCF/D
J-1	6-18-70	447	524	88	447	419	112
	11- 1-71	282	407	350	198	326	184
J-2	6-18-70	460	532	81	460	426	109
	10-11-71	381	378	169	239	302	110
L-1	4-17-70	504	509	30	478	407	77
	9- 6-71	462	372	167	177	298	87
L-3	12- 1-70	402	474	26	437	379	55
	9-16-71	461	334	161	232	267	119
M-1	5-17-70	489	536	34	497	429	76
	9-21-71	370	374	56	204	299	32
O-1	5-17-70	481	543	27	494	434	51
	11-15-71	301	447	108	209	358	56

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
CONTINENTAL Exhibit No. 7
Case No. 4628
1-26-72 Hearing

NEW MEXICO OIL CONSERVATION COMMISSION
WELL DELIVERABILITY TEST REPORT FOR 19 71

Form C122-A
Revised 1-1-66

POOL NAME	POOL SLOPE	FORMATION	COUNTY
SOUTH BLANCO	n= 85	PICTURED CLIFFS	RIO ARRIBA

COMPANY			WELL NAME AND NUMBER		
CONTINENTAL OIL COMPANY			AXI APACHE 'J' NO.1		
UNIT LETTER	SECTION	TOWNSHIP	RANGE	PURCHASING PIPELINE	
D	5	25N	5W	SO UNION GAS CO	
CASING O.D. – INCHES	CASING I.D. – INCHES	SET AT DEPTH – FEET	TUBING O.D. – INCHES	TUBING I.D. – INCHES	TOP – TUBING PERF. – FEET
5.5000	5.0120	3010	2.375	1.995	2886
GAS PAY ZONE FROM 2900 TO 2918		WELL PRODUCING THRU CASING / TUBING X		GAS GRAVITY 0.680	GRAVITY X LENGTH 1962
DATE OF FLOW TEST FROM 10-18-71 TO 10-26-7			DATE SHUT-IN PRESSURE MEASURED 11/ 1/71		

PRESSURE DATA – ALL PRESSURES IN PSIA

(a) Flowing Casing Pressure (DWt)	(b) Flowing Tubing Pressure (DWt)	(c) Flowing Meter Pressure (DWt)	(d) Flow Chart Static Reading	(e) Meter Error (Item c – Item d)	(f) Friction Loss (a – c) or (b – c)	(g) Average Meter Pressure (Integr.)
216	194	282	281	1	-88	281
(h) Corrected Meter Pressure (g + e)	**(i) Avg. Wellhead Press. P_t = (h+f)**	**(j) Shut-in Casing Pressure (DWt)**	**(k) Shut-in Tubing Pressure (DWt)**	**(l) P_c = higher value of (j) or (k)**	**(m) Del. Pressure P_d = 80 %P_c**	**(n) Separator or Dehydrator Pr. (DWt) for critical flow only**
282	194	407	402	407	326	

FLOW RATE CORRECTION (METER ERROR)

Integrated Volume – MCF/D	Quotient of $\frac{\text{Item c}}{\text{Item d}}$	$\sqrt{\frac{\text{Item c}}{\text{Item d}}}$	Corrected Volume
349	1.00355	1.00177	Q = 350. MCF/D

WORKING PRESSURE CALCULATION

$(1-e^{-s})$	$(F_c\ Q_m)^2\ (1000)$	$R^2 = (1-e^{-s})\ (F_c\ Q_m)^2 (1000)$	P_t^2	$P_w^2 = P_t^2 + R^2$	$P_w = \sqrt{P_w^2}$
0.13299	10.82900	1440.1521	37636.	39076.	198

DELIVERABILITY CALCULATION

$$D = Q\left[\frac{P_c^2 - P_d^2}{P_c^2 - P_w^2}\right]^n = 350\left[\left(\frac{59373.}{126445.}\right)^n = (0.46)^n = 0.525\right] = 184 \text{ MCF/D}$$

REMARKS:

FC= 9.402129

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
CONTINENTAL Exhibit No. 8
Case No. 4628

SUMMARY

Item h	282	Psia
P_c	407	Psia
Q	350	MCF/D
P_w	198	Psia
P_d	326	Psia
D	184	MCF/D

Company CONTINENTAL OIL COMPANY
By W. G. HENDRICKSON
Title SENIOR STAFF ASSISTANT
Witnessed By
Company

1-26-72

NMOCC-AZTEC(3), BEA, FILE, WS

4

NEW MEXICO OIL CONSERVATION COMMISSION
WELL DELIVERABILITY TEST REPORT FOR 19 71

Form C122-A
Revised 1-1-66

POOL NAME	POOL SLOPE	FORMATION	COUNTY
SOUTH BLANCO	n= 85	PICTURED CLIFFS	RIO ARRIBA

COMPANY			WELL NAME AND NUMBER		
CONTINENTAL OIL COMPANY			AXI APACHE O NO. 1		
UNIT LETTER	SECTION	TOWNSHIP	RANGE	PURCHASING PIPELINE	
A	10	25N	4W	SO UNION GAS CO	
CASING O.D. – INCHES	CASING I.D. – INCHES	SET AT DEPTH – FEET	TUBING O.D. – INCHES	TUBING I.D. – INCHES	TOP – TUBING PERF. – FEET
5.5000	5.0120	3860	2.375	1.995	3738
GAS PAY ZONE		WELL PRODUCING THRU		GAS GRAVITY	GRAVITY X LENGTH
FROM 3741 TO 3811		CASING	TUBING X	0.651	2433
DATE OF FLOW TEST			DATE SHUT-IN PRESSURE MEASURED		
FROM 11-01-71 TO 11-08-71			11/15/71		

PRESSURE DATA – ALL PRESSURES IN PSIA

(a) Flowing Casing Pressure (DWt)	(b) Flowing Tubing Pressure (DWt)	(c) Flowing Meter Pressure (DWt)	(d) Flow Chart Static Reading	(e) Meter Error (Item c – Item d)	(f) Friction Loss (a – c) or (b – c)	(g) Average Meter Pressure (Integr.)
212	190	282	284	-2	-92	303
(h) Corrected Meter Pressure (g + e)	**(i) Avg. Wellhead Press. P_t = (h+f)**	**(j) Shut-in Casing Pressure (DWt)**	**(k) Shut-in Tubing Pressure (DWt)**	**(l) P_c = higher value of (j) or (k)**	**(m) Del. Pressure P_d = 80 %P_c**	**(n) Separator or Dehydrator Pr. (DWt) for critical flow only**
301	209	447	447	447	358	

FLOW RATE CORRECTION (METER ERROR)

Integrated Volume – MCF/D	Quotient of $\frac{\text{Item c}}{\text{Item d}}$	$\sqrt{\frac{\text{Item c}}{\text{Item d}}}$	Corrected Volume
108	0.99295	0.99647	Q = 108 MCF/D

WORKING PRESSURE CALCULATION

$(1-e^{-s})$	$(F_c\ Q_m)^2\ (1000)$	$R^2 = (1-e^{-s})(F_c\ Q_m)^2(1000)$	P_t^2	$P_w^2 = P_t^2 + R^2$	$P_w = \sqrt{P_w^2}$
0.16217	1.03109	167.2231	43681.	43848.	209

DELIVERABILITY CALCULATION

$$D = Q\left[\frac{P_c^2 - P_d^2}{P_c^2 - P_w^2}\right]^n = 108\left[\left(\frac{71645.}{156128.}\right)^n = (0.45)^n = 0.515\right] = 56 \text{ MCF/D}$$

REMARKS:

FC= 9.402129

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Cont Exhibit No. 9

SUMMARY

Item h	301	Psia
P_c	447	Psia
Q	108	MCF/D
P_w	209	Psia
P_d	358	Psia
D	56	MCF/D

Company CONTINENTAL OIL COMPANY 4028
By W. G. HENDRICKSON
Title SENIOR STAFF ASSISTANT
Witnessed By
Company

1-26-72

NMOCC-AZTEC(3), BEA, FILE, WS

NEW MEXICO OIL CONSERVATION COMMISSION
WELL DELIVERABILITY TEST REPORT FOR 19 71

Form C122-A
Revised 1-1-65.

POOL NAME	POOL SLOPE	FORMATION	COUNTY
SOUTH BLANCO	n= 85	PICTURED CLIFFS	RIO ARRIBA

COMPANY			WELL NAME AND NUMBER		
CONTINENTAL OIL COMPANY			AXI APACHE 'J' NO.2		
UNIT LETTER	SECTION	TOWNSHIP	RANGE	PURCHASING PIPELINE	
P	5	25N	5W	SO UNION GAS CO	
CASING O.D. – INCHES	CASING I.D. – INCHES	SET AT DEPTH – FEET	TUBING O.D. – INCHES	TUBING I.D. – INCHES	TOP – TUBING PERF. – FEET
5.5000	5.0120	2970	2.375	1.995	2900
GAS PAY ZONE		WELL PRODUCING THRU		GAS GRAVITY	GRAVITY X LENGTH
FROM 2900 TO 2916		CASING	TUBING X	0.680	1972
DATE OF FLOW TEST		DATE SHUT-IN PRESSURE MEASURED			
FROM 09-18-71 TO 09-26-7		10/11/71			

PRESSURE DATA – ALL PRESSURES IN PSIA

(a) Flowing Casing Pressure (DWt)	(b) Flowing Tubing Pressure (DWt)	(c) Flowing Meter Pressure (DWt)	(d) Flow Chart Static Reading	(e) Meter Error (Item c – Item d)	(f) Friction Loss (a – c) or (b – c)	(g) Average Meter Pressure (Integr.)
210	199	342	345	-3	-143	384
(h) Corrected Meter Pressure (g + e)	**(i) Avg. Wellhead Press. P_t = (h + f)**	**(j) Shut-in Casing Pressure (DWt)**	**(k) Shut-in Tubing Pressure (DWt)**	**(l) P_c = higher value of (j) or (k)**	**(m) Del. Pressure P_d = 80 %P_c**	**(n) Separator or Dehydrator Pr. (DWt) for critical flow only**
381	238	378	378	378	302	

FLOW RATE CORRECTION (METER ERROR)

Integrated Volume – MCF/D	Quotient of $\frac{\text{Item c}}{\text{Item d}}$	$\sqrt{\frac{\text{Item c}}{\text{Item d}}}$	Corrected Volume
170	0.99130	0.99564	Q = 169. MCF/D

WORKING PRESSURE CALCULATION

$(1-e^{-s})$	$(F_c\ Q_m)^2$ (1000)	$R^2 = (1-e^{-s})(F_c\ Q_m)^2(1000)$	P_t^2	$P_w^2 = P_t^2 + R^2$	$P_w = \sqrt{P_w^2}$
0.13359	2.52479	337.2877	56644.	56981.	239

DELIVERABILITY CALCULATION

$$D = Q\left[\frac{P_c^2 - P_d^2}{P_c^2 - P_w^2}\right]^n = 169 \left[\left(\frac{51680.}{85763.}\right)^n = (0.60)^n = 0.650\right] = 110 \text{ MCF/D}$$

REMARKS:

FC= 9.402129

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
CONTINENTAL Exhibit No. 10
Case No. 4628

SUMMARY

Item h	381	Psia
P_c	378	Psia
Q	169	MCF/D
P_w	239	Psia
P_d	302	Psia
D	110	MCF/D

Company CONTINENTAL OIL COMPANY
By W. G. HENDRICKSON
Title SENIOR STAFF ASSISTANT
Witnessed By
Company

1-26-72 Hearing

NMOCC-AZTEC(3), BEA, FILE, WS

NEW MEXICO OIL CONSERVATION COMMISSION
WELL DELIVERABILITY TEST REPORT FOR 19 71

Form C122-A
Revised 1-1-65

POOL NAME	POOL SLOPE	FORMATION	COUNTY
SOUTH BLANCO	n= 85	PICTURED CLIFFS	RIO ARRIBA

COMPANY			WELL NAME AND NUMBER		
CONTINENTAL OIL COMPANY			AXI APACHE 'L' NO.1		
UNIT LETTER	SECTION	TOWNSHIP	RANGE	PURCHASING PIPELINE	
M	36	25N	4W	SO UNION GAS CO	
CASING O.D. - INCHES	CASING I.D. - INCHES	SET AT DEPTH - FEET	TUBING O.D. - INCHES	TUBING I.D. - INCHES	TOP - TUBING PERF. - FEET
5.5000	5.0120	3398	2.375	1.995	3364
GAS PAY ZONE		WELL PRODUCING THRU		GAS GRAVITY	GRAVITY X LENGTH
FROM 3281 TO 3330		CASING	TUBING X	0.705	2372
DATE OF FLOW TEST			DATE SHUT-IN PRESSURE MEASURED		
FROM 8-23-71 TO 8-30-71			9/ 6/71		

PRESSURE DATA - ALL PRESSURES IN PSIA

(a) Flowing Casing Pressure (DWt)	(b) Flowing Tubing Pressure (DWt)	(c) Flowing Meter Pressure (DWt)	(d) Flow Chart Static Reading	(e) Meter Error (Item c - Item d)	(f) Friction Loss (a - c) or (b - c)	(g) Average Meter Pressure (Integr.)
202	186	472	472	0	-286	462
(h) Corrected Meter Pressure (g + e)	**(i) Avg. Wellhead Press. P_t = (h+f)**	**(j) Shut-in Casing Pressure (DWt)**	**(k) Shut-in Tubing Pressure (DWt)**	**(l) P_c = higher value of (j) or (k)**	**(m) Del. Pressure P_d = 80 %P_c**	**(n) Separator or Dehydrator Pr. (DWt) for critical flow only**
462	176	372	372	372	298	

FLOW RATE CORRECTION (METER ERROR)

Integrated Volume - MCF/D	Quotient of Item c / Item d	$\sqrt{\text{Item c / Item d}}$	Corrected Volume
167	1.00000	1.00000	Q = 167 MCF/D

WORKING PRESSURE CALCULATION

$(1-e^{-s})$	$(F_c Q_m)^2$ (1000)	$R^2 = (1-e^{-s})(F_c Q_m)^2(1000)$	P_t^2	$P_w^2 = P_t^2 + R^2$	$P_w = \sqrt{P_w^2}$
0.15840	2.46538	390.5298	30976.	31367.	177

DELIVERABILITY CALCULATION

$$D = Q\left[\frac{P_c^2 - P_d^2}{P_c^2 - P_w^2}\right]^n = 167\left[\left(\frac{49580}{107055}\right)^n = (0.46)^n = 0.519\right] = 87 \text{ MCF/D}$$

REMARKS:

FC= 9.402129

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
CONTINENTAL Exhibit No. 11
Case No. 4628

SUMMARY

Item h	462	Psia
P_c	372	Psia
Q	167	MCF/D
P_w	177	Psia
P_d	298	Psia
D	87	MCF/D

Company CONTINENTAL OIL COMPANY
By W. G. FENDRICKSON
Title SENIOR STAFF ASSISTANT
Witnessed By
Company

NMOCC-AZTEC(3), BEA, FILE, WS

1-26-72 Hearing

NEW MEXICO OIL CONSERVATION COMMISSION
WELL DELIVERABILITY TEST REPORT FOR 19 71

Form C122-A
Revised 1-1-66

POOL NAME	POOL SLOPE	FORMATION	COUNTY
SOUTH BLANCO	n= 85	PICTURED CLIFFS	RIO ARRIBA

COMPANY			WELL NAME AND NUMBER		
CONTINENTAL OIL COMPANY			AXI APACHE L NO. 3		
UNIT LETTER	SECTION	TOWNSHIP	RANGE	PURCHASING PIPELINE	
M	35	24N	4W	SO UNION GAS CO	
CASING O.D. – INCHES	CASING I.D. – INCHES	SET AT DEPTH – FEET	TUBING O.D. – INCHES	TUBING I.D. – INCHES	TOP – TUBING PERF – FEET
4.5000	4.0900	3321	2.375	1.995	3207
GAS PAY ZONE		WELL PRODUCING THRU		GAS GRAVITY	GRAVITY X LENGTH
FROM 3226 TO 3282		CASING	TUBING X	0.711	2280
DATE OF FLOW TEST		DATE SHUT-IN PRESSURE MEASURED			
FROM 09-02-71 TO 09-09-71		9/16/71			

PRESSURE DATA – ALL PRESSURES IN PSIA

(a) Flowing Casing Pressure (DWt)	(b) Flowing Tubing Pressure (DWt)	(c) Flowing Meter Pressure (DWt)	(d) Flow Chart Static Reading	(e) Meter Error (Item c – Item d)	(f) Friction Loss (a – c) or (b – c)	(g) Average Meter Pressure (Integr.)
239	227	457	458	-1	-230	462
(h) Corrected Meter Pressure (g + e)	**(i) Avg. Wellhead Press. P_t = (h + f)**	**(j) Shut-in Casing Pressure (DWt)**	**(k) Shut-in Tubing Pressure (DWt)**	**(l) P_c = higher value of (j) or (k)**	**(m) Del. Pressure P_d = .80 × F_c**	**(n) Separator or Dehydrator Pr. (DWt) for critical flow only**
461	231	334	334	334	267	

FLOW RATE CORRECTION (METER ERROR)

Integrated Volume – MCF/D	Quotient of $\frac{\text{Item c}}{\text{Item d}}$	$\sqrt{\frac{\text{Item c}}{\text{Item d}}}$	Corrected Volume
161	0.99781	0.99890	Q = 161 MCF/D

WORKING PRESSURE CALCULATION

$(1-e^{-s})$	$(F_c\,Q_m)^2\,(1000)$	$R^2 = (1-e^{-s})\,(F_c\,Q_m)^2(1000)$	P_t^2	$P_w^2 = P_t^2 + R^2$	$P_w = \sqrt{P_w^2}$
0.15279	2.29141	350.1061	53361.	53711.	232

DELIVERABILITY CALCULATION

$$D = Q\left[\frac{P_c^2 - P_d^2}{P_c^2 - P_w^2}\right]^n = 161\left[\left(\frac{40267.}{57732.}\right)^{n}\left(\quad\right)^{n} = 0.69 = 0.736\right] = 119 \text{ MCF/D}$$

REMARKS:

FC= 9.402129

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
CONTINENTAL Exhibit No. 12
Case No. 4628

SUMMARY

Item h	461	Psia
P_c	334	Psia
Q	161	MCF/D
P_w	232	Psia
P_d	267	Psia
D	119	MCF/D

Company CONTINENTAL OIL COMPANY
By [illegible] FLORICKSON
Title SENIOR STAFF ASSISTANT
Witnessed By
Company

1-26-72

NMOCC-AZTEC(3), PEA, FILE, WS

NEW MEXICO OIL CONSERVATION COMMISSION
WELL DELIVERABILITY TEST REPORT FOR 1971

Form C122-A
Revised 1-1-66

POOL NAME	POOL SLOPE	FORMATION	COUNTY
SOUTH BLANCO	n= 85	PICTURED CLIFFS	RIO ARRIBA

COMPANY			WELL NAME AND NUMBER		
CONTINENTAL OIL COMPANY			AXI APACHE M NO. 1		
UNIT LETTER	SECTION	TOWNSHIP	RANGE	PURCHASING PIPELINE	
M	23	25N	4W	SO UNION GAS CO	
CASING O.D. - INCHES	CASING I.D. - INCHES	SET AT DEPTH - FEET	TUBING O.D. - INCHES	TUBING I.D. - INCHES	TOP - TUBING PERF. - FEET
4.5000	4.0900	3460	2.375	1.995	3350
GAS PAY ZONE FROM 3374 TO 3406		WELL PRODUCING THRU CASING TUBING X		GAS GRAVITY 0.680	GRAVITY X LENGTH 2278
DATE OF FLOW TEST FROM 09-13-71 TO 09-20-71			DATE SHUT-IN PRESSURE MEASURED 9/27/71		

PRESSURE DATA - ALL PRESSURES IN PSIA

(a) Flowing Casing Pressure (DWt)	(b) Flowing Tubing Pressure (DWt)	(c) Flowing Meter Pressure (DWt)	(d) Flow Chart Static Reading	(e) Meter Error (Item c - Item d)	(f) Friction Loss (a-c) or (b-c)	(g) Average Meter Pressure (Integr.)
216	199	365	367	-2	-166	372
(h) Corrected Meter Pressure (g + e)	**(i) Avg. Wellhead Press. P_t = (h+f)**	**(j) Shut-in Casing Pressure (DWt)**	**(k) Shut-in Tubing Pressure (DWt)**	**(l) P_c = higher value of (j) or (k)**	**(m) Del. Pressure P_d = 80 %P_c**	**(n) Separator or Dehydrator Pr. (DWt) for critical flow only**
370	204	374	374	374	299	

FLOW RATE CORRECTION (METER ERROR)

Integrated Volume - MCF/D	Quotient of Item c / Item d	$\sqrt{\text{Item c} / \text{Item d}}$	Corrected Volume
56	0.99455	0.99727	Q = 56. MCF/D

WORKING PRESSURE CALCULATION

$(1-e^{-s})$	$(F_c Q_m)^2 (1000)$	$R^2 = \frac{(F_c Q_m)^2 (1000)}{(1-e^{-s})}$	P_t^2	$P_w^2 = P_t^2 + R^2$	$P_w = \sqrt{P_w^2}$
0.15265	0.27722	42.3197	41616.	41658.	204

DELIVERABILITY CALCULATION

$$D = Q\left[\frac{P_c^2 - P_d^2}{P_c^2 - P_w^2}\right]^n = 56 \left[\left(\frac{50475.}{98250.}\right)^n \left(0.51\right)^n = 0.567\right] = 32 \text{ MCF/D}$$

REMARKS:

FC= 9.402129

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
CONTINENTAL Exhibit No. 13
Case No. 4428

SUMMARY

Item h	370	Psia
P_c	374	Psia
Q	56	MCF/D
P_w	204	Psia
P_d	299	Psia
D	32	MCF/D

Company CONTINENTAL OIL COMPANY
By W. G. HENDRICKSON
Title SENIOR STAFF ASSISTANT
Witnessed By
Company

1-26-72 Hearing

NMOCC-AZTEC(3), BEA, FILE, WS

COMPARISON OF THEORETICAL ALLOWABLE
AND ACTUAL PRODUCTION
SOUTH BLANCO PICTURED CLIFFS POOL
FEBRUARY THROUGH NOVEMBER 1971

COMPANY	THEORETICAL ALLOWABLE (MCF)	ACTUAL PRODUCTION (MCF)	ACTUAL PRODUCTION AS A PER CENT OF THEORETICAL ALLOWABLE	TRUNK SYSTEM
Caulkins	1,352,196	1,209,234	89.43	North
McDonald	125,450	100,710	80.28	North
Southern Union	1,015,658	677,960	66.75	West-East
Aztec	256,806	135,494	52.76	East
Conoco	867,317	412,524	47.56	East
Abraham	51,755	12,121	23.42	East
Total or Average	3,669,182	2,548,043	69.44	

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Exhibit No. 22
Case No. 4628
1-26-72

EXHIBIT _____

ANALYSIS OF SOUTHERN UNION EXHIBITS

OPERATOR	EX. 6 Jan. 1	EX. 8 Jan. 1	Jan. 1 MCF/W-D	Ex. 4 Jan. 1	EX. 6 Jan. 9	EX. 8 Jan. 9	Jan. 9 MCF/W-D	EX. 4 Jan. 9	Change in Prod. (MCF)*	Change in Prod. Pres.**
Aztec	5,026	74	68	289	5,201	88	59	278	- 9	- 9
Abraham	501	14	36	285	447	15	30	270	- 6	-15
Caulkins	32,335	242	133	201	32,422	256	127	194	- 6	- 7
Conoco	13,701	214	64	268	15,632	233	67	258	+ 3	-10
McDonald	2,662	28	95	198	2,492	31	80	190	-15	- 8
Southern Union	19,628	147	133	271	22,573	235	96	253	-37	-18

* Production Change on a per well-day basis 1-1 to 1-9, 1972.

** Average Producing Pressure Change 1-1 to 1-9, 1972.

BEFORE ME
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
Exhibit No. 23
Case No. 4628