CASE 5118: Application of SHELL OIL CO. FOR AN EXTENSION OF ORDER NO. R-4289, LEA COUNTY.

CASE No.

5118

Application,

Transcripts,

Small Exhibits

ETC.

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
CONFERENCE ROOM, STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO

Wednesday, November 28, 1973

IN THE MATTER OF:

Application of Shell Oil Company for an extension of Order No. R-4289, Lea County, New Mexico.

Case No. 5118

BEFORE: Richard L. Stamets,
Examiner

TRANSCRIPT OF HEARING

dearnley, meier & associates
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MR. STAMETS: Case 5118.

MR. CARR: Case 5118: Application of Shell Oil Company for an extension of Order No. R-4289, Lea County, New Mexico.

MR. BUELL: Sumner Buell, of Montgomery, Federici, Andrews, Hannah and Morris, Santa Fe, appearing on behalf of the applicant.

MR. STAMETS: Are there other appearances in the case?

(No response)

* * * *

ROBERT KRETZLER,

was called as a witness, and after being duly sworn according to law, testified as follows:

DIRECT EXAMINATION

BY MR. BUELL:

Q Would you state your name, by whom you are employed, in what capacity, and where?

A Robert Kretzler. I live in Midland, Texas, and am employed by Shell as a senior production engineer.

Q Would you give the Examiner a background of your education and work history, please?

A I graduated from the University of Pittsburgh with a bachelor of science degree in petroleum engineering in 1953. I have worked in the Permean Basin since then

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for some twenty years. I started out with Shell in 1960 as a field engineer sitting on wildcats and field development wells where the work consisted of evaluations. At one time, Shell engineers were very specialized, and I worked some five years at what we call a production geologist position. That work involved evaluating drilling programs and defining structures and allied work such as the preparation of discovery applications and that sort of thing.

I spent six or some years working as supervisor of a group of engineers that drilled development wells. Then later the group performed the workovers.

Q Are you familiar with what Shell seeks in Case 5118?

A Yes. Shell seeks to extend Order R-4289 until its Antelope Ridge Well No. 2 is completed.

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

MR. STAMETS: They are.

Q (By Mr. Buell) I refer you to what has been marked for identification as Applicant's Exhibit One. Would you please address yourself to Exhibit One and explain what that shows?

A Exhibit One is a location plat of the Antelope Ridge Unit in Lea County, New Mexico. It covers six sections in Township 24 South, Range 34 East. There are three

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zones that are produced, and the two that we are concerned with in the application are the Morrow and Devonian. The Morrow producing area is outlined with the small dashed line, whereas the unit boundary and the Devonian and participating area is designated by the solid line.

Q The well in question and the offset well, the Unit Wells Nos. 2 and 4, are located in Section 4, Township 24 South, Range 34 East; is that correct?

A Yes. Shell produces two Devonian wells in the field, and we have three Morrow completions.

Q Referring you to what has been marked as Exhibit Number Two, would you explain this exhibit and at the same time perhaps give us a little history of this well that is of interest in this case?

A Exhibit Number Two is a downhole drawing of the dual Antelope Ridge Well No. 2. It was drilled to the Ellenberger and tested. It is dually completed in the Devonian at approximately 14,700 feet, and through the Morrow perforation at approximately 13,100 feet. The well has two strings of tubing. The upper string is set at 11,465 feet, and the lower string is hung at 13,824.

The two zones are separated by packers as is the annulus. This exhibit has been shown previously at the original hearing, but there have been several additions

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to it. This one has the addition of fish in the upper string consisting of tools, several sets of knuckle joints, several sets of sinker bars. Attempts were made-- Several attempts were made to recover this junk in the shallow string unsuccessfully.

Pressure was used to help force the junk out of the hole after it was engaged by bleeding the tubing pressure, and all that did was separate the jars.

Other changes in this plat are that we show holes that were perforated in long strings at 11,510 feet. These were made during one of the workover attempts to try and circulate calcium carbonate fluid into the Morrow to break off the zone so we could kill the well.

It also shows a perforating gun in the bottom of the well that wasn't shown on the previous plat.

Q Could you give us the previous history of this well and the difficulties that you have experienced with it?

A Yes. During the packer leakage test in October of 1971, the well seemed to have satisfactory separation, but when it was returned to production, the normally sweet Morrow side of the well began to produce sour gas. We made several attempts immediately to repair the well.

On the initial attempt, we found that the tubing was corkscrewed, and that resulted in an effort with a star drill.

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On the second attempt, we made an effort to kill the thing, and we abandoned this after we were unable to load the hole.

There is approximately a 3500 pound differential between the Morrow and the waterdrive Devonian. The Morrow would take anything that was put into the well, and we attempted to seal it off with carbonates, but were unable to do so. We had considerable difficulty in getting by the fish in the short tubing string.

In this workover attempt, we introduced some additional Morrow zone, which appeared to open with bottomhole pressure of some 6600 pounds. This was calculated by running a bottomhole pressure bomb above the fish. This was considerably in excess of the 2500 pounds we had measured previously on the bottomhole pressure survey approximately a year before.

This workover attempt was abandoned. We made a third attempt in February of 1972, and this is where we perforated the long string below the upper packer. We were trying to facilitate placing carbonate in the Morrow perforation by perforating the long string and circulating it through there.

The high pressure Morrow zone then required ten pounds of brine to kill it, whereas the Devonian zone was sufficient to hold it. We did get the well into

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balance to the extent that we got the well head off and attempted to pull the tubing string,and found that the short string was damaged at this point.

Further workovers were abandoned. This was in March of 1972. This is when we requested relief, and were granted a permit to downhole commingle the well.

Subsequently we deepened the twin well, the Antelope Ridge No. 4. It was an abandoned Atoka well. We deepened it to the Morrow, and were attempting to make a withdrawal point in the Morrow in that zone so that we could go into the No. 2 Well and abandon the Morrow and make a single zone there.

After the deepened well was fracture treated, it produced approximately 8/10 of a million cubic feet of gas, and the pressure indicated that we were at virgin reservoir pressure not in communication with the Morrow zone.

So the situation is now that both wells are producing. The Well No. 2 is producing commingled downhole. The deepened well is producing. We have two Morrow wells producing on the same prorationing pad. The combined production from the two wells-- three zones in the two wells is approximately 4,000,000 cubic feet of gas and twenty-seven barrels of condensate per day.

This gas is going into Southern Union's five to six

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hundred pound gathering system.

Q Referring you to Exhibits Three and Four, would you explain what those show?

A Exhibit Three is a structural plat contoured on the Morrow marker. About all it shows is that the entire accumulation is within the Antelope Ridge Unit.

Q And Exhibit Number Four?

A Exhibit Four is likewise a structure interpretation contoured on the top of the Devonian. Again, this rests within the unit boundary. This is the only Devonian production in the immediate area.

Q Referring you to what has been marked as Exhibits Five and Six, would you please explain those?

A Exhibits Five and Six are pertinent field statistics of the Morrow and Devonian reservoirs. I would like to point out that the accumulative Morrow gas production to the first of the year was 24.6 MCF. The accumulative production of the Antelope Ridge No. 2 to date is approximately 9.9 MCF.

The state of depletion in the Well No. 2 is sixty-six percent in the Morrow. The Devonian has produced 24.4 MCF to the first of the year. The Antelope Ridge has produced 8 1/2 MCF to date. The stage of depletion on the Well No. 2 is seventy-five percent. It could be more, it's difficult to tell, because it is

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a waterdrive reservoir.

Q Referring you to Exhibits Seven and Eight, would you please explain those?

A When we were granted permission to commingle the well, a procedure was set up to monitor and allocate production in the commingled well. This procedure was to monitor the hydrogen sulphur content in the commingled well. These hydrogen sulphide measurements are measured by Wolf Laboratories in Odessa. They are made monthly, and there is direct comparison made in the third column on the tabulation as to the gas and condensate percentage that is allocated to the Devonian zone as a result of the hydrogen sulphide measurements.

Based on experience, we feel this is a reliable method of allocation.

Q And referring you to Exhibit Number Eight. Would you explain that, please?

A Exhibit Eight is merely a tabulation of the production history and allocations shown on the previous data.

Q And referring you to Exhibit Nine. Would you explain that, please?

A Exhibit Nine is what we have estimated it would cost us to repair Well No. 2 if we had a trouble-free operation other than what we anticipate at this point. It also assumes that we can do this work with a pulling unit.

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We have had some bad experiences working on similar wells, and we feel that this thing is probably unrealistically low. The $125,000 we show here probably would double if we got on the well. The attachments to this are prognoses as we see it with a trouble-free workover.

Q Do you feel that the granting of this application for the extension of the order would prevent waste and protect correlative rights?

A Yes, I think by allowing both zones to continue to produce, we will minimize downhole cross flowing. The Morrow has a history of being susceptible to damage, and I think there is a distinct possibility here of losing the Morrow. This is our main concern. If we don't lose it, we can easily damage it with workover fluids.

Again, we have no assurance that the current Morrow producing zone in Well No. 2 can be salvaged, even if the well were re-drilled. From our experience in the No. 4 Well, we conclude this because we have not been able to get into the same reservoir.

Q Is there also a risk involved in any workover?

A We feel that there is a very high risk of a blow-out and possible fire during any workover. The Morrow will have to be blocked off, and we use a calcium carbonate fill because it could be acidized back from the formation, and

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we feel that we will get less damage this way.

We have to go into the well with a wash pipe, and we feel that we probably would lose circulation as we went by the Morrow circulation with the wash pipe. The result would be that we would lose circulation due to the 3500 differential between zones.

Of course, if we have a blow-out and can't control the well, we would either lose the reserves due to fire, or we would have to abandon the well and the field, and this would eliminate any workover possibilities.

We feel that correlative rights would not be jeopardized because both producing areas are located in the Antelope area.

It is our opinion that Shell has made an effort to correct the commingling in the Antelope No. 2. We have made three workover attempts, we have spent approximately a half a million dollars to date attempting to repair the problem. We estimate it will probably take a quarter of a million to repair the downhole tubing. In the event the well has to be re-drilled, we are looking at an additional $800,000 to replace it.

Q Were Exhibits One through Nine prepared by you or under your supervision?

A They were.

MR. BUELL: At this time, Mr. Examiner, we move for

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the admission of Applicant's Exhibits One through Nine.

MR. STAMETS: Without objection, they will be admitted.

(Whereupon Applicant's Exhibits One through Nine were admitted in evidence.)

MR. BUELL: We have nothing further.

* * * *

CROSS EXAMINATION

BY MR. STAMETS:

Q Mr. Kretzler, do you feel that the production from this well since the inadvertent attempt to commingle has given any indication of any problems in either reservoir?

A There has been a reduction in the water production. We are losing approximately fifty barrels of water per day. The condensate production is down slightly. This seems to have gradually happened over the life of the well, however at the producing rate we see now, it is somewhat comparable to what it was before.

Q I am not clear as to what this means. Do you think you are losing Devonian water in the Morrow formation, or how do you see this change?

A The well isn't being pulled as hard as it has been, and we felt that as we got the well back on production to the extent it had been producing previously that the well will get a certain amount of this back.

Q It is your testimony then that the safest way to produce

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the remaining reserves from these two zones is to allow the well to continue to produce with the zones open together in the well bore?

A That's correct, sir.

MR. STAMETS: Are there any other questions of the witness?

(No response)

MR. STAMETS: If not, he may be excused.

(Witness excused.)

MR. STAMETS: Do you have anything further, Mr. Buell?

MR. BUELL: No, sir.

MR. STAMETS: Are there any statements?

MR. TRAWICK: My name is Carl Trawick with the United States Geological Survey, and I would like to make a statement.

MR. STAMETS: Proceed, please.

MR. TRAWICK: In view of the potential loss or damage of one or both of the formations, we agree with Shell that it is better to continue to produce the well. We would tend to agree with Shell's application.

MR. STAMETS: Is there anything further in this case?

(No response)

MR. STAMETS: Case 5118 will be taken under advisement.

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C E R T I F I C A T E

I, RICHARD E. McCORMICK, Certified Shorthand Reporter, in and for the County of Bernalillo, State of New Mexico, 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.

Richard E. McCormick
CERTIFIED SHORTHAND REPORTER

Nov 28
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Richard L. Stamets

dearnley, meier & associates
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OIL CONSERVATION COMMISSION

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

GOVERNOR
BRUCE KING
CHAIRMAN

LAND COMMISSIONER
ALEX J. ARMIJO
MEMBER

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

December 11, 1973

Re: Case No. 5118
Order No. R-4289-A
Applicant:
Shell Oil Company

Mr. Sumner Buell
Montgomery, Federici, Andrews,
Hannahs & Buell
Attorneys at Law
Post Office Box 2307
Santa Fe, New Mexico

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
Other Mr. Carl Traywick - U.S.G.S. - Roswell, N.M.

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. 5118
Order No. R-4289-A

APPLICATION OF SHELL OIL COMPANY
FOR AN EXTENSION OF ORDER NO. R-4289,
LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on December 3, 1973, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 11th day of December, 1973, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

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

(2) That Shell Oil Company seeks an extension of the downhole commingling authority granted by Order No. R-4289 for applicant's Antelope Ridge Well No. 2, located in Unit B of Section 4, Township 24 South, Range 34 East, NMPM, Antelope Ridge Field, Lea County, New Mexico.

(3) That pursuant to the authority granted by Order R-2787, the subject well was completed as a dual completion (conventional) to produce gas from the Antelope Ridge-Morrow Pennsylvanian and the Antelope Ridge-Devonian Gas Pools.

(4) That communization between the two zones developed in the Fall of 1971 due to mechanical difficulties.

(5) That the applicant has expended substantial sums and diligent effort to remedy or alleviate the situation to no avail.

(6) That the reservoir characteristics of the Antelope Ridge-Morrow Pennsylvanian and Antelope Ridge Devonian zones in the subject well are such that underground waste would not be caused by a continuation of the commingling in the wellbore.

(7) That one or both of the producing zones might be lost or damaged during further workover operations.

(8) That the method of allocating production to each of the commingled zones upon the basis of the H_2S content of the commingled stream will protect correlative rights.

(9) That approval of the subject application will prevent waste and protect correlative rights.

IT IS THEREFORE ORDERED:

(1) That the applicant, Shell Oil Company, is hereby authorized an extension of Order No. R-4289, which order authorized temporary downhole commingling of the Morrow Pennsylvanian and Devonian production in the wellbore in its Antelope Ridge Well No. 2, located in Unit B of Section 4, Township 24 South, Range 34 East, Antelope Ridge Field, Lea County, New Mexico, until further order of the Commission.

(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

I. R. TRUJILLO, Chairman

ALEX J. ARMIJO, Member

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

S E A L

jr/

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. 4690
Order No. R-4289

APPLICATION OF SHELL OIL COMPANY
FOR DOWNHOLE COMMINGLING, LEA
COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on April 5, 1972, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 17th day of April, 1972, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

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

(2) That the applicant, Shell Oil Company, is the owner and operator of the Antelope Ridge Well No. 2, a dual completion, located in Unit B of Section 4, Township 24 South, Range 34 East, NMPM, Lea County, New Mexico.

(3) That pursuant to authority granted by Order No. R-2787 the subject well was completed as a dual completion (conventional) to produce gas from the Antelope Ridge-Morrow Pennsylvanian and Antelope Ridge-Devonian Gas Pools.

(4) That communication between the two zones developed in the Fall of 1971.

(5) That the applicant has made diligent efforts to repair the well.

(6) That during the efforts to repair the well a new high pressure zone in the Morrow formation was opened to the well-bore which makes workover attempts extremely hazardous.

(7) That the new high pressure Morrow zone is believed to be of limited extent.

(8) That the applicant should be allowed to produce the well, commingling in the well-bore the production from the Devonian and Morrow zones, for one year or until such time as gas pressures have decreased to such an extent that the well can be safely repaired, whichever occurs first.

(9) That the applicant proposes to allocate production to each of the commingled zones upon the basis of the H_2S content of the commingled stream as compared to the H_2S content of the Devonian gas from its Antelope Ridge Well No. 3 located in Unit K of Section 34, Township 23 South, Range 34 East.

(10) That the reservoir characteristics of the Antelope Ridge-Morrow Pennsylvanian and Antelope Ridge-Devonian zones in the subject well are such that underground waste would not be caused by the proposed commingling in the well-bore.

(11) That approval of the subject application will prevent waste and protect correlative rights.

IT IS THEREFORE ORDERED:

(1) That the applicant, Shell Oil Company, is hereby authorized to produce its Antelope Ridge Well No. 2, located in Unit B of Section 4, Township 24 South, Range 34 East, NMPM, Lea County, New Mexico, in such a manner as to produce gas from the Antelope Ridge-Morrow Pennsylvanian and Antelope Ridge-Devonian Gas Pools, commingling in the well-bore the production from said zones.

PROVIDED HOWEVER, that the operator shall so produce the subject well for a period of one year or until such time as gas pressures have decreased to such an extent that the well can be safely repaired, whichever occurs first.

(2) That the commingled production shall be allocated to the Antelope Ridge-Morrow Pennsylvanian and Antelope Ridge-Devonian zones upon the basis of the H_2S content of the commingled stream as compared to the H_2S content of the Devonian gas from its Antelope Ridge Well No. 3 located in Unit K of Section 34, Township 23 South, Range 34 East, NMPM, as determined by gas analyses conducted at least once each month.

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

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

BRUCE KING, Chairman

ALEX J. ARMIJO, Member

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

S E A L

dr/

Case 4690

Applicant seeks an extension of Down hole Commingling authority granted by R-4289 for applicants well (describe) until depletion.

That DHC resulted from mechanical difficulties

Operator has expended substantial sums and diligent effort to remedy or alleviate the situation to no avail.

That one or both of the producing zones might be lost or damaged during work over operations

That the method of allocating production based H2S content will protect correlative rights.

Approval prevent waste protect rights

Grant application

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. 4690
Order No. R-4289

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FOR DOWNHOLE COMMINGLING, LEA
COUNTY, NEW MEXICO.

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PROVIDED HOWEVER, that the operator shall so produce the subject well for a period of one year or until such time as gas pressures have decreased to such an extent that the well can be safely repaired, whichever occurs first.

(2) That the commingled production shall be allocated to the Antelope Ridge-Morrow Pennsylvanian and Antelope Ridge-Devonian zones upon the basis of the H_2S content of the commingled stream as compared to the H_2S content of the Devonian gas from its Antelope Ridge Well No. 3 located in Unit K of Section 34, Township 23 South, Range 34 East, NMPM, as determined by gas analyses conducted at least once each month.

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

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

BRUCE KING, Chairman

ALEX J. ARMIJO, Member

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

S E A L

dr/

Docket No. 34-73

DOCKET: COMMISSION HEARING - TUESDAY - NOVEMBER 27, 1973

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

CASE 5063: (De Novo)

Application of Shell Oil Company for an unorthodox oil well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of an unorthodox location for its Sanger Well No. 6Y to be located 1220 feet from the North line and 180 feet from the West line of Section 27, Township 18 South, Range 38 East, Hobbs Pool, Lea County, New Mexico.

Upon application of Samedan Oil Corporation, this case will be heard De Novo pursuant to the provisions of Rule 1220.

Docket No. 36-73

DOCKET: EXAMINER HEARING - TUESDAY - DECEMBER 11, 1973

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

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

ALLOWABLE: (1) Consideration of the allowable production of gas for January, 1974, from fifteen prorated pools in Lea, Eddy, Roosevelt and Chaves Counties, New Mexico;

(2) Consideration of the allowable production of gas from nine prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico, for January, 1974.

Docket No. 35-73

DOCKET: EXAMINER HEARING - WEDNESDAY - NOVEMBER 28, 1973

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

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

CASE 5115: Application of Mobil Oil Corporation for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Corral Draw Unit Area comprising 19,199 acres, more or less, of Federal and State lands in Townships 25 and 26 South, Range 29 East, Eddy County, New Mexico.

CASE 5116: Application of Mobil Oil Corporation for a pressure maintenance project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a pressure maintenance project by the injection of water and/or gas into the Middle Pennsylvanian formation of its Bridges State Well No. 147 located in Unit F of Section 13, Township 17 South, Range 34 East, Vacuum-Middle Pennsylvanian Pool, Lea County, New Mexico, the W/2 of said Section 13 to be the initial project area. Applicant further seeks the promulgation of rules for said project including a provision for administrative approval for expansion thereof.

CASE 5117: Application of Roger C. Hanks for creation of a new pool and special rules, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the creation of the North Dagger Draw-Cisco Canyon Oil Pool in Sections 24, 25, and 36, Township 19 South, Range 24 East, Sections 18, 19, 30 and 31, Township 19 South, Range 25 East, and Section 1, Township 20 South, Range 24 East, Eddy County, New Mexico, and the promulgation of special pool rules therefor, including a provision for 320-acre spacing and proration units and specified well locations.

CASE 5118: Application of Shell Oil Company for an extension of Order No. R-4289, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the indefinite extension of Order No. R-4289, which order as extended authorized temporary downhole commingling of the Morrow Pennsylvanian and Devonian production in the wellbore in its Antelope Ridge Well No. 2 located in Unit B of Section 4, Township 24 South, Range 34 East, Antelope Ridge Field, Lea County, New Mexico.

CASE 5119: Application of Getty Oil Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Stock Unit Area comprising 5,760 acres, more or less, of State lands in Township 21 South, Range 33 East, Lea County, New Mexico.

CASE 5120: Application of Lone Star Producing Company for a dual completion and salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water by

(Case 5120 continued from Page 1)

injection into the San Andres formation through the annulus between 5 1/2-inch and 8 5/8-inch casing strings of its New Mexico State 80 Well No. 1 located in Unit B of Section 33, Township 14 South, Range 34 East, Tres Papalotes-Pennsylvanian Pool, Lea County, New Mexico, and to produce oil from said pool through 2 3/8-inch tubing installed within the 5 1/2-inch casing.

CASE 5121: Application of Texaco Inc. for a non-standard gas proration unit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for a 160-acre non-standard gas proration unit comprising the SE/4 of Section 25, Township 20 South, Range 32 East, South Salt Lake-Morrow Gas Pool, Lea County, New Mexico, to be dedicated to its Audie Richards Well No. 1 located in Unit P of said Section 25.

CASE 5122: Application of Sun Oil Company for the creation of a new oil pool and special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new oil pool for Wolfcamp production for its Shern Federal Well No. 1 located in Unit M of Section 15, Township 19 South, Range 32 East, Lusk Field, Lea County, New Mexico, and the promulgation of special pool rules therefor including a provision for 160-acre spacing and proration units and a special limiting gas-oil ratio of 4000 to 1.

CASE 5123: Application of Consolidated Oil & Gas Inc. for downhole commingling, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks authority to commingle gas production from the Flora Vista-Gallup Gas Pool and the Basin Dakota-Gas Pool in the wellbore of its Clayton Well No. 1-2 located in Unit N of Section 2, Township 30 North, Range 12 West, San Juan County, New Mexico.

CASE 5124: Application of Belco Petroleum Corporation for compulsory pooling and an unorthodox gas well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests underlying the S/2 of Section 30, Township 20 South, Range 33 East, South Salt Lake-Morrow Gas Pool, Lea County, New Mexico, to be dedicated to a well to be drilled at an unorthodox location 660 feet from the South line and 1300 feet from the East line of said Section 30. Also to be considered will be the cost of drilling and completing said well and the allocation of such costs, as well as actual operating costs and charges for supervision. Also to be considered is the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 5126: Application of Atlantic Richfield Company for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Avalon Deep Unit Area comprising 10, 117 acres, more or less, of fee, Federal, and State lands in Township 21 South, Ranges 26 and 27 East, Eddy County, New Mexico.

CASE 5127: Application of Skelly Oil Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Salt Lake South Unit Area comprising 7080.12 acres, more or less, of State and Federal lands in Township 21 South, Range 32 East, Lea County, New Mexico.

CASE 5125: Northwestern nomenclature case calling for the creation and extension of certain pools in McKinley, San Juan, Rio Arriba and Sandoval Counties, New Mexico:

(a) Create a new pool in McKinley County, New Mexico, classified as an oil pool for Mesaverde production and designated as the Blackeye-Mesaverde Oil Pool. The discovery well is the K & W Oil Co. #55-Y Jaco located in Unit D of Section 32, Township 20 North, Range 9 West, NMPM. Said pool would comprise:

TOWNSHIP 20 NORTH, RANGE 9 WEST, NMPM
Section 29: W/2 SW/4
Section 30: SE/4 NE/4 and NE/4 SE/4
Section 32: NW/4 NW/4

(b) Create a new pool in McKinley County, New Mexico, classified as an oil pool for Dakota production and designated as the Blackeye-Dakota Oil Pool. The discovery well is the Colorado Plateau Geological Services, Inc. #1 Blackeye located in Unit M of Section 29, Township 20 North, Range 9 West, NMPM. Said pool would comprise:

TOWNSHIP 20 NORTH, RANGE 9 WEST, NMPM
Section 29: SW/4 SW/4

(c) Create a new pool in McKinley County, New Mexico, classified as a gas pool for Dakota A production and designated as the Lone Pine-Dakota A Pool. The discovery well is the Tenneco Oil Co. #2 SFPRR located in Unit L of Section 13, Township 17 North, Range 9 West, NMPM. Said pool would comprise:

TOWNSHIP 17 NORTH, RANGE 9 WEST, NMPM
Section 13: SW/4
Section 23: NE/4
Section 24: NW/4

(d) Create a new pool in San Juan County, New Mexico, classified as a gas pool for Fruitland production and designated as the Mt. Nebo-Fruitland Pool. The discovery well is the Amoco Production Co. #1 Keys Gas Com E located in Unit D of Section 27, Township 32 North, Range 10 West, NMPM. Said pool would comprise:

TOWNSHIP 32 NORTH, RANGE 10 WEST, NMPM
Section 27: NW/4
Section 28: NE/4

(Case 5120 continued from Page 1)

injection into the San Andres formation through the annulus between 5 1/2-inch and 8 5/8-inch casing strings of its New Mexico State 80 Well No. 1 located in Unit B of Section 33, Township 14 South, Range 34 East, Tres Papalotes-Pennsylvanian Pool, Lea County, New Mexico, and to produce oil from said pool through 2 3/8-inch tubing installed within the 5 1/2-inch casing.

CASE 5121: Application of Texaco Inc. for a non-standard gas proration unit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for a 160-acre non-standard gas proration unit comprising the SE/4 of Section 25, Township 20 South, Range 32 East, South Salt Lake-Morrow Gas Pool, Lea County, New Mexico, to be dedicated to its Audie Richards Well No. 1 located in Unit P of said Section 25.

CASE 5122: Application of Sun Oil Company for the creation of a new oil pool and special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new oil pool for Wolfcamp production for its Shern Federal Well No. 1 located in Unit M of Section 15, Township 19 South, Range 32 East, Lusk Field, Lea County, New Mexico, and the promulgation of special pool rules therefor including a provision for 160-acre spacing and proration units and a special limiting gas-oil ratio of 4000 to 1.

CASE 5123: Application of Consolidated Oil & Gas Inc. for downhole commingling, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks authority to commingle gas production from the Flora Vista-Gallup Gas Pool and the Basin Dakota-Gas Pool in the wellbore of its Clayton Well No. 1-2 located in Unit N of Section 2, Township 30 North, Range 12 West, San Juan County, New Mexico.

CASE 5124. Application of Belco Petroleum Corporation for compulsory pooling and an unorthodox gas well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests underlying the S/2 of Section 30, Township 20 South, Range 33 East, South Salt Lake-Morrow Gas Pool, Lea County, New Mexico, to be dedicated to a well to be drilled at an unorthodox location 660 feet from the South line and 1300 feet from the East line of said Section 30. Also to be considered will be the cost of drilling and completing said well and the allocation of such costs, as well as actual operating costs and charges for supervision. Also to be considered is the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 5126: Application of Atlantic Richfield Company for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Avalon Deep Unit Area comprising 10,117 acres, more or less, of fee, Federal, and State lands in Township 21 South, Ranges 26 and 27 East, Eddy County, New Mexico.

CASE 5127: Application of Skelly Oil Company for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Salt Lake South Unit Area comprising 7080.12 acres, more or less, of State and Federal lands in Township 21 South, Range 32 East, Lea County, New Mexico.

CASE 5125: Northwestern nomenclature case calling for the creation and extension of certain pools in McKinley, San Juan, Rio Arriba and Sandoval Counties, New Mexico:

(a) Create a new pool in McKinley County, New Mexico, classified as an oil pool for Mesaverde production and designated as the Blackeye-Mesaverde Oil Pool. The discovery well is the K & W Oil Co. #55-Y Jaco located in Unit D of Section 32, Township 20 North, Range 9 West, NMPM. Said pool would comprise:

TOWNSHIP 20 NORTH, RANGE 9 WEST, NMPM
Section 29: W/2 SW/4
Section 30: SE/4 NE/4 and NE/4 SE/4
Section 32: NW/4 NW/4

(b) Create a new pool in McKinley County, New Mexico, classified as an oil pool for Dakota production and designated as the Blackeye-Dakota Oil Pool. The discovery well is the Colorado Plateau Geological Services, Inc. #1 Blackeye located in Unit M of Section 29, Township 20 North, Range 9 West, NMPM. Said pool would comprise:

TOWNSHIP 20 NORTH, RANGE 9 WEST, NMPM
Section 29: SW/4 SW/4

(c) Create a new pool in McKinley County, New Mexico, classified as a gas pool for Dakota A production and designated as the Lone Pine-Dakota A Pool. The discovery well is the Tenneco Oil Co. #2 SFPRR located in Unit L of Section 13, Township 17 North, Range 9 West, NMPM. Said pool would comprise:

TOWNSHIP 17 NORTH, RANGE 9 WEST, NMPM
Section 13: SW/4
Section 23: NE/4
Section 24: NW/4

(d) Create a new pool in San Juan County, New Mexico, classified as a gas pool for Fruitland production and designated as the Mt. Nebo-Fruitland Pool. The discovery well is the Amoco Production Co. #1 Keys Gas Com E located in Unit D of Section 27, Township 32 North, Range 10 West, NMPM. Said pool would comprise:

TOWNSHIP 32 NORTH, RANGE 10 WEST, NMPM
Section 27: NW/4
Section 28: NE/4

(e) Extend the Angels Peak-Gallup Pool in San Juan County, New Mexico, to include therein:

TOWNSHIP 26 NORTH, RANGE 9 WEST, NMPM
Section 6: N/2
Section 7: SW/4
Section 8: All
Section 9: W/2
Section 18: W/2 & SE/4
Section 23: W/2

TOWNSHIP 26 NORTH, RANGE 10 WEST, NMPM
Section 3: SW/4 & S/2 SE/4
Section 11: S/2
Section 12: All
Section 13: N/2

(f) Extend the Aztec-Pictured Cliffs Pool in San Juan County, New Mexico, to include therein:

TOWNSHIP 28 NORTH, RANGE 8 WEST, NMPM
Section 18: W/2

TOWNSHIP 29 NORTH, RANGE 9 WEST, NMPM
Section 18: S/2
Section 20: SW/4

TOWNSHIP 29 NORTH, RANGE 10 WEST, NMPM
Section 12: SW/4

TOWNSHIP 31 NORTH, RANGE 11 WEST, NMPM
Section 18: SE/4
Section 21: SW/4
Section 28: SE/4
Section 31: E/2
Section 32: SW/4

TOWNSHIP 31 NORTH, RANGE 12 WEST, NMPM
Section 2: N/2
Section 3: NE/4

(g) Extend the Ballard-Pictured Cliffs Pool in Rio Arriba, Sandoval and San Juan Counties, New Mexico, to include therein:

TOWNSHIP 22 NORTH, RANGE 2 WEST, NMPM
Section 6: N/2 & SE/4
Section 7: NE/4
Section 8: W/2

TOWNSHIP 23 NORTH, RANGE 3 WEST, NMPM
Section 15: S/2
Section 16: S/2
Section 21: All
Section 22: All
Section 23: All
Section 26: N/2
Section 27: N/2 & SE/4
Section 28: NE/4

TOWNSHIP 23 NORTH, RANGE 4 WEST, NMPM
Section 24: NE/4

TOWNSHIP 23 NORTH, RANGE 5 WEST, NMPM
Section 14: NW/4

TOWNSHIP 24 NORTH, RANGE 6 WEST, NMPM
Section 17: SW/4
Section 20: N/2

(h) Extend the Blanco-Mesaverde Pool in Rio Arriba and San Juan Counties, New Mexico, to include therein:

TOWNSHIP 26 NORTH, RANGE 5 WEST, NMPM
Section 8: E/2
Section 9: All
Section 10: W/2
Section 14: N/2

TOWNSHIP 27 NORTH, RANGE 9 WEST, NMPM
Section 9: SE/4
Section 34: S/2

TOWNSHIP 28 NORTH, RANGE 9 WEST, NMPM
Section 7: All (Partial)
Section 18: All
Section 19: All
Section 31: W/2

TOWNSHIP 28 NORTH, RANGE 10 WEST, NMPM
Section 13: E/2

(i) Extend the Blanco-Pictured Cliffs Pool in San Juan County, New Mexico, to include therein:

TOWNSHIP 29 NORTH, RANGE 7 WEST, NMPM
Section 30: SW/4
Section 31: W/2

TOWNSHIP 29 NORTH, RANGE 8 WEST, NMPM

Section 5:	SE/4	Section 25:	W/2 & SE/4
Section 8:	S/2	Section 26:	E/2
Section 14:	N/2	Section 33:	W/2
Section 15:	S/2	Section 34:	NE/4
Section 16:	S/2	Section 35:	N/2
Section 17:	S/2 & NE/4	Section 36:	N/2
Section 23:	SE/4		

TOWNSHIP 29 NORTH, RANGE 9 WEST, NMPM

Section 6:	S/2
Section 7:	All
Section 18:	NE/4

TOWNSHIP 30 NORTH, RANGE 9 WEST, NMPM

Section 14:	NE/4

TOWNSHIP 30 NORTH, RANGE 10 WEST, NMPM

Section 2:	All	Section 14:	NE/4
Section 5:	SE/4	Section 15:	SW/4
Section 6:	NE/4	Section 16:	N/2 & SE/4
Section 9:	NE/4	Section 22:	SE/4
Section 10:	N/2	Section 23:	S/2
Section 11:	All	Section 24:	SW/4
Section 12:	SW/4	Section 25:	All
Section 13:	All	Section 26:	NE/4

TOWNSHIP 31 NORTH, RANGE 9 WEST, NMPM

Section 31:	S/2

TOWNSHIP 31 NORTH, RANGE 10 WEST, NMPM

Section 18:	SW/4	Section 32:	E/2
Section 29:	SE/4	Section 35:	S/2
Section 31:	S/2	Section 36:	S/2

TOWNSHIP 31 NORTH, RANGE 11 WEST, NMPM

Section 3:	All	Section 12:	All
Section 4:	All	Section 13:	E/2
Section 5:	N/2 & SE/4	Section 14:	N/2
Section 8:	SW/4	Section 17:	N/2
Section 9:	N/2	Section 23:	W/2
Section 10:	N/2	Section 25:	SW/4
Section 11:	All		

TOWNSHIP 32 NORTH, RANGE 11 WEST, NMPM

Section 21:	E/2	Section 32:	All
Section 22:	SW/4	Section 33:	All
Section 27:	All	Section 34:	All
Section 28:	All	Section 35:	S/2
Section 29:	N/2 & SE/4		

(j) Extend the South Blanco-Pictured Cliffs Pool in Rio Arriba, Sandoval and San Juan Counties, New Mexico, to include therein:

TOWNSHIP 23 NORTH, RANGE 1 WEST, NMPM
Section 8: SE/4

TOWNSHIP 25 NORTH, RANGE 6 WEST, NMPM
Section 9: E/2 Section 16: NE/4

TOWNSHIP 27 NORTH, RANGE 6 WEST, NMPM
Section 17: NE/4

TOWNSHIP 28 NORTH, RANGE 6 WEST, NMPM
Section 26: SW/4 Section 35: W/2
Section 27: E/2 Section 36: NW/4

TOWNSHIP 28 NORTH, RANGE 7 WEST, NMPM
Section 16: E/2

TOWNSHIP 28 NORTH, RANGE 8 WEST, NMPM
Section 8: All (Partial) Section 18: E/2
Section 9: All (Partial) Section 19: NE/4
Section 14: W/2 & SE/4 Section 20: NW/4
Section 15: N/2 Section 23: NE/4
Section 16: NE/4 Section 24: W/2 & SE/4
Section 17: All Section 25: N/2

(k) Extend the Choza Mesa-Pictured Cliffs Pool in Rio Arriba County, New Mexico, to include therein:

TOWNSHIP 28 NORTH, RANGE 4 WEST, NMPM
Section 23: W/2

(l) Extend the Flora Vista-Fruitland Pool in San Juan County, New Mexico, to include therein:

TOWNSHIP 30 NORTH, RANGE 12 WEST, NMPM
Section 1: SW/4
Section 2: S/2
Section 3: SE/4

(m) Extend the South Gallegos-Fruitland Pool in San Juan County, New Mexico, to include therein:

TOWNSHIP 26 NORTH, RANGE 12 WEST, NMPM
Section 1: SW/4

(n) Extend the Gonzales-Mesaverde Pool in Rio Arriba County, New Mexico, to include therein:

TOWNSHIP 25 NORTH, RANGE 5 WEST, NMPM
Section 4: SW/4 Section 9: NW/4
Section 5: SE/4

TOWNSHIP 26 NORTH, RANGE 5 WEST, NMPM
Section 29: SW/4 Section 32: W/2
Section 31: S/2

(o) Extend the Hospah-Dakota Oil Pool in McKinley County, New Mexico, to include therein:

TOWNSHIP 17 NORTH, RANGE 8 WEST, NMPM
Section 5: SW/4 SW/4 Section 7: N/2 NE/4
Section 6: SE/4 SE/4

(p) Extend the Kutz-Fruitland Pool in San Juan County, New Mexico, to include therein:

TOWNSHIP 28 NORTH, RANGE 11 WEST, NMPM
Section 13: W/2

(q) Extend the Largo-Chacra Pool in Rio Arriba & San Juan Counties, New Mexico, to include therein:

TOWNSHIP 27 NORTH, RANGE 8 WEST, NMPM

Section 10:	NE/4	Section 16:	S/2
Section 11:	All	Section 17:	SE/4
Section 13:	W/2 & SE/4	Section 23:	N/2
Section 14:	All	Section 25:	W/2
Section 15:	S/2	Section 26:	E/2

(r) Extend the South Lindrith-Gallup Dakota Oil Pool in Rio Arriba County, New Mexico, to include therein:

TOWNSHIP 24 NORTH, RANGE 4 WEST, NMPM
Section 21: SE/4 Section 28: N/2 & SW/4

(s) Extend the Lone Pine-Dakota D Oil Pool in McKinley County, New Mexico, to include therein:

TOWNSHIP 17 NORTH, RANGE 8 WEST, NMPM
Section 7: S/2 NE/4 Section 8: W/2 NW/4

(t) Extend the North Los Pinos-Fruitland Pool in San Juan County, New Mexico, to include therein:

TOWNSHIP 32 NORTH, RANGE 8 WEST, NMPM
Section 13: SE/4

(u) Extend the Otero-Chacra Pool in Rio Arriba County, New Mexico, to include therein:

TOWNSHIP 25 NORTH, RANGE 5 WEST, NMPM

Section 2:	SW/4	Section 12:	W/2
Section 3:	SE/4	Section 14:	NW/4
Section 10:	SE/4	Section 15:	NE/4
Section 11:	S/2 & NE/4		

TOWNSHIP 26 NORTH, RANGE 5 WEST, NMPM
Section 31: W/2 Section 32: SW/4

TOWNSHIP 26 NORTH, RANGE 6 WEST, NMPM

Section 21:	SW/4	Section 33:	E/2
Section 26:	NW/4 & SE/4	Section 34:	All
Section 27:	All	Section 36:	S/2

TOWNSHIP 26 NORTH, RANGE 7 WEST, NMPM
Section 11: N/2

(v) Extend the Pinon-Fruitland Pool in San Juan County, New Mexico, to include therein:

TOWNSHIP 28 NORTH, RANGE 11 WEST, NMPM
Section 8: All (Partial)
Section 9: All (Partial)

(w) Extend the Tapacito-Pictured Cliffs Pool in Rio Arriba County, New Mexico, to include therein:

TOWNSHIP 26 NORTH, RANGE 3 WEST, NMPM
Section 21: NE/4

TOWNSHIP 27 NORTH, RANGE 5 WEST, NMPM
Section 6: SE/4 Section 27: N/2
Section 15: SE/4

(x) Extend the Tocito Dome-Pennsylvanian D Oil Pool in San Juan County, New Mexico, to include therein:

TOWNSHIP 26 NORTH, RANGE 18 WEST, NMPM
Section 26: NW/4 Section 27: NE/4

(y) Extend the Ute Dome-Dakota Pool in San Juan County, New Mexico, to include therein:

TOWNSHIP 31 NORTH, RANGE 14 WEST, NMPM
Section 10: All Section 11: All

TOWNSHIP 32 NORTH, RANGE 14 WEST, NMPM
Section 25: E/2

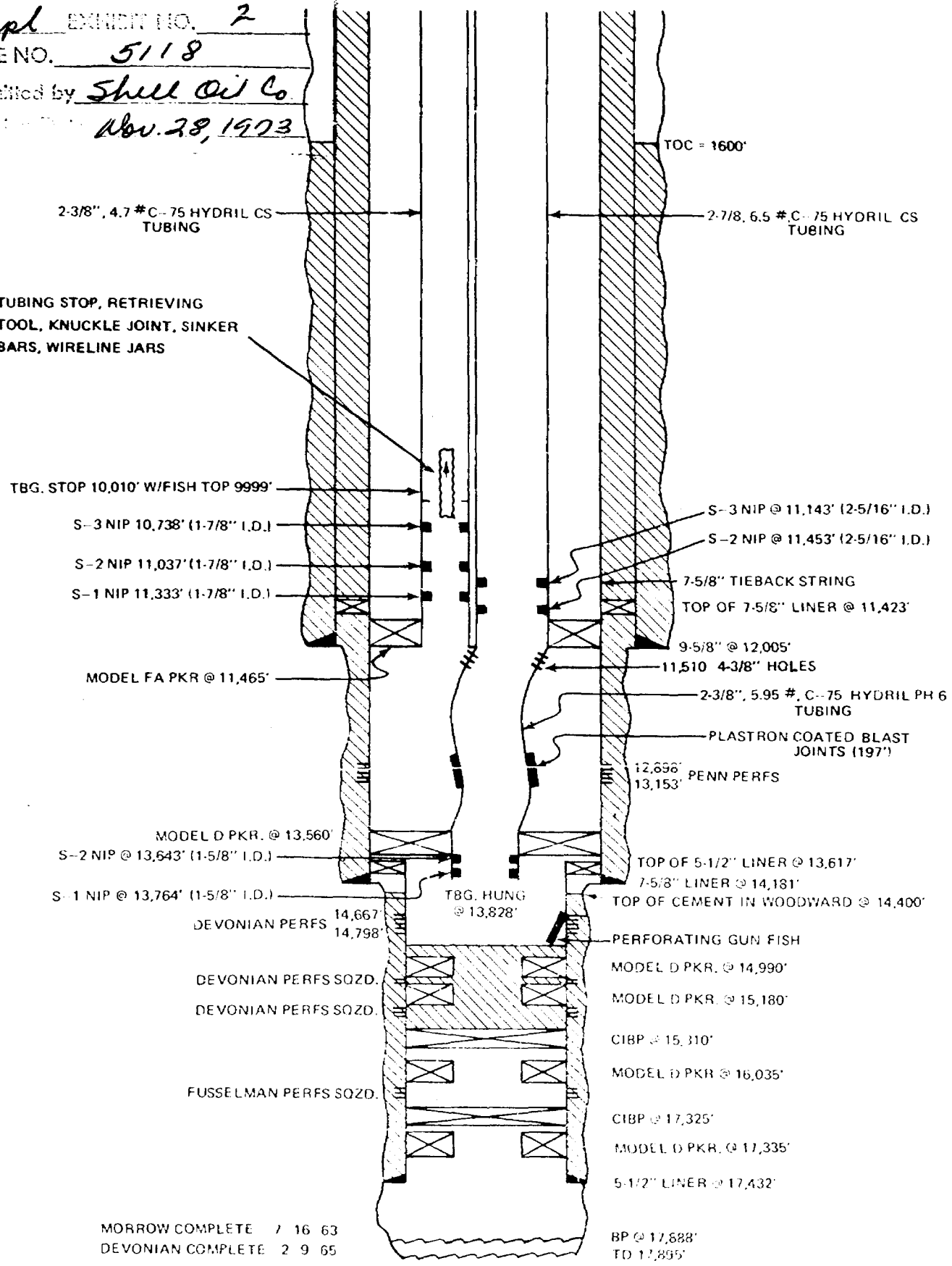
(z) Extend the Ute Dome-Paradox Pool in San Juan County, New Mexico, to include therein:

TOWNSHIP 31 NORTH, RANGE 14 WEST, NMPM
Section 10: All

TOWNSHIP 32 NORTH, RANGE 14 WEST, NMPM
Section 25: All

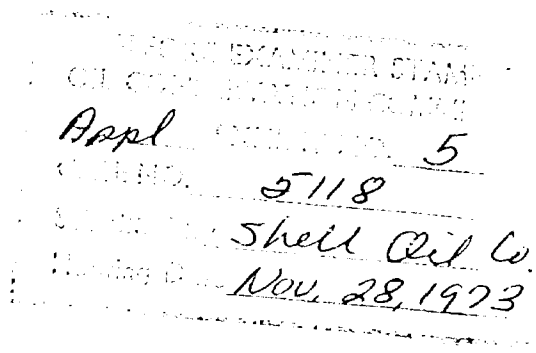
BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION
Appl EXHIBIT NO. 2
CASE NO. 5118
Submitted by Shell Oil Co.
Date Nov. 28, 1973

ANTELOPE RIDGE UNIT NO. 2
DF 3567



PERTINENT FIELD STATISTICS
MORROW RESERVOIR
ANTELOPE RIDGE FIELD
LEA COUNTY, NEW MEXICO

Average Porosity	9%
Average Permeability	40.4 md
Average Water Saturations	25%
Average Oil Saturations	---
Average Net Effective Pay Thickness	29'
Average Gravity of Gas	.60
Average Gravity of Oil	48°
Original Reservoir Pressure	8731
Reservoir Temperature	184° F.
Additional Reservoir Pressure Data (8/70) (Prior to Communication)	2407 psi
Condition of Well During Pressure Test	Shut-in
Cumulative Morrow Reservoir Gas Production to 1/73	24.6 BCF
Cumulative Morrow Production of Antelope Ridge #2 to 10/73	9.9 BCF
Stage of Depletion of Well #2	66% depleted 10/73



PERTINENT FIELD STATISTICS
DEVONIAN RESERVOIR
ANTELOPE RIDGE FIELD
LEA COUNTY, NEW MEXICO

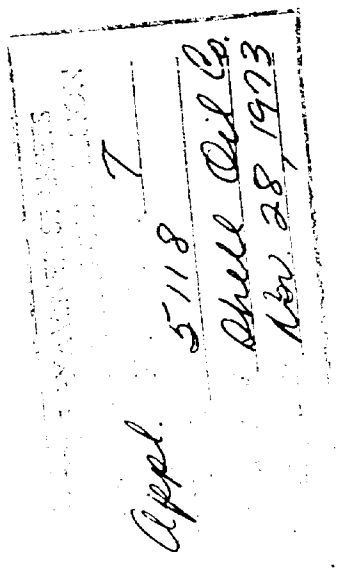
Average Porosity	6.5%
Average Permeability	4.5 md
Average Water Saturations	30%
Average Oil Saturations	----
Average Net Effective Pay Thickness	173'
Average Gravity of Gas	.67 Orig. - .62 Current
Average Gravity of Oil	50° API Cond.
Original Reservoir Pressure	6410
Reservoir Temperature	217°
Additional Reservoir Pressure Data (8/70)	6161 psi
Condition of Well During Pressure Test	Shut-in
Cumulative Devonian Reservoir Gas Production to 1/73	24.4 BCF
Cumulative Devonian Production of Antelope Ridge #2 to 10/73	8.5 BCF
Stage of Depletion of Well #2 (Minimum)	75% depleted 10/73

BEFORE EXAMINER STAMETS
OIL CONSERVATION DIVISION
Appl. EXHIBIT NO. 6
CASE NO. 5118
SUBMITTED BY: Shell Oil Co.
HEARING DATE: Nov 28, 1973

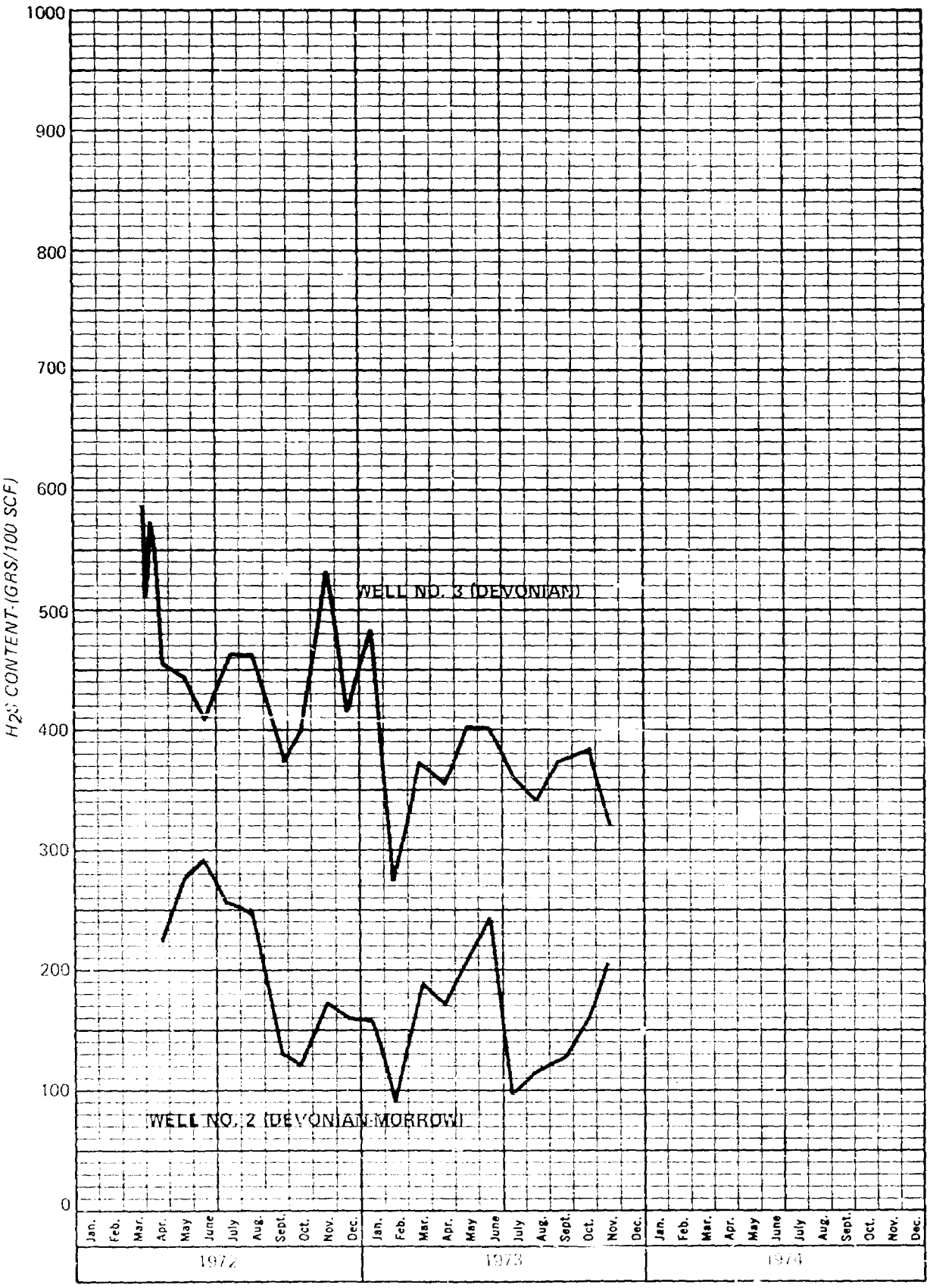
H_2S CONTENT OF GAS
(GRAIN/100 SCF)
ANTELOPE RIDGE FIELD
NOVEMBER 20, 1973

DATE	WELL NO. 2	WELL NO. 3	DEV GAS IN COMMINGLED STREAM WELL NO. 2
3-31-72	-	579.22	-
4-02-72	-	502.69	-
4-04-72	-	565.50	-
4-25-72	220.06	447.93	.49
5-22-72	273.00	436.00	.63
6-15-72	286.46	401.20	.71
7-20-72	250.36	458.68	.55
8-15-72	250.36	458.68	.55
9-29-72	130.46	370.14	.35
10-18-72	120.24	397.80	.30
11-19-72	170.50	530.00	.32
12-14-72	158.10	408.00	.39
1-13-73	156.80	481.60	.33
2-13-73	89.90	270.00	.33
3-15-73	185.40	370.82	.50
4-15-73	165.02	350.14	.47
5-15-73	200.34	399.82	.50
6-15-73	242.14	398.06	.61
7-15-73	94.26	355.04	.26
8-18-73	118.44	335.28	.35
9-18-73	126.00	370.06	.34
10-15-73	152.51	383.25	.40
11-13-73	205.00	320.00	.64

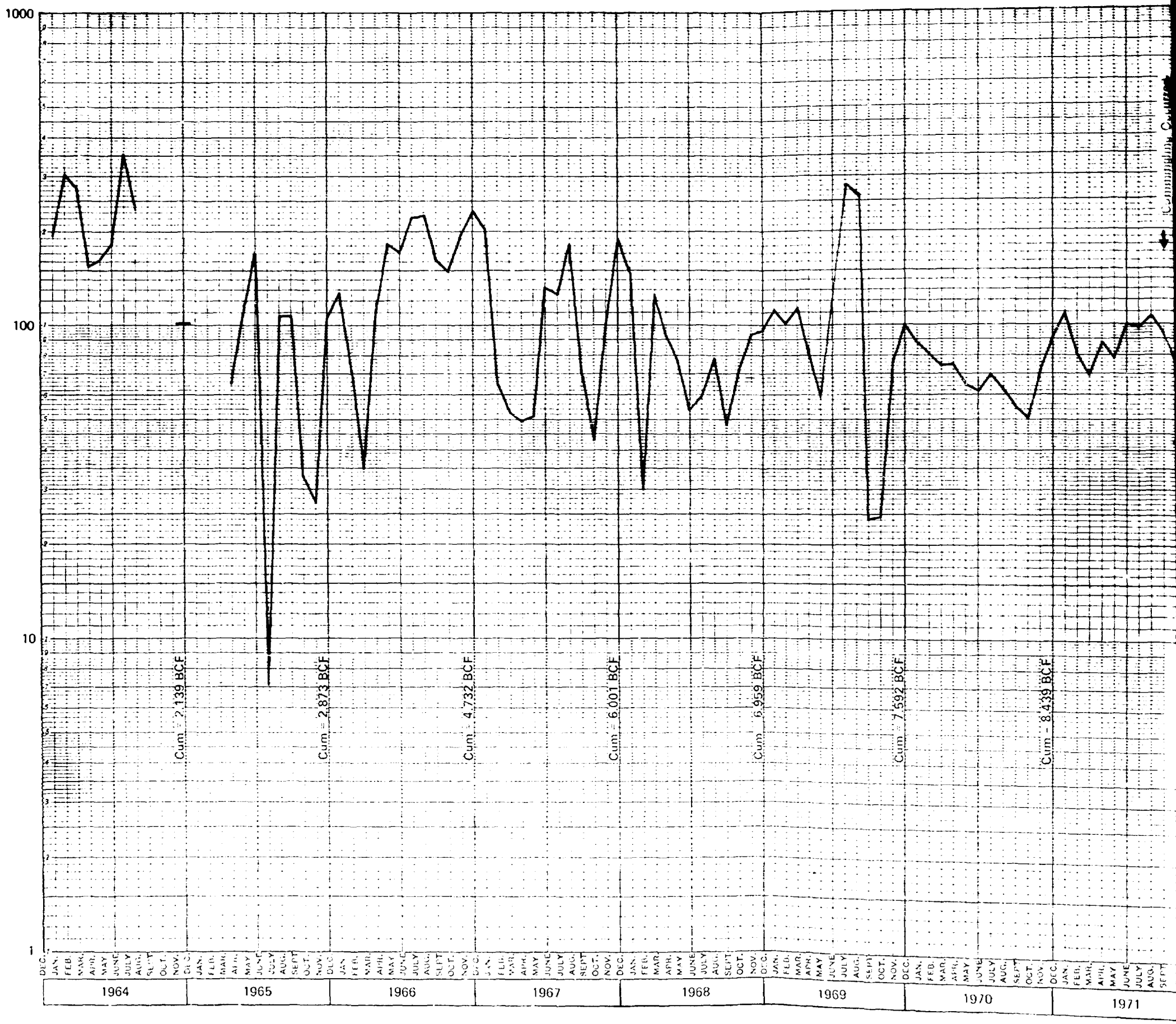
NOTE: NMOCC approved allocation of Morrow and Devonian production from Well No. 2 based upon H_2S content of Well No. 3 on April 17, 1972.



H_2S CONTENT
ANTELOPE RIDGE FIELD
NOVEMBER 14, 1973

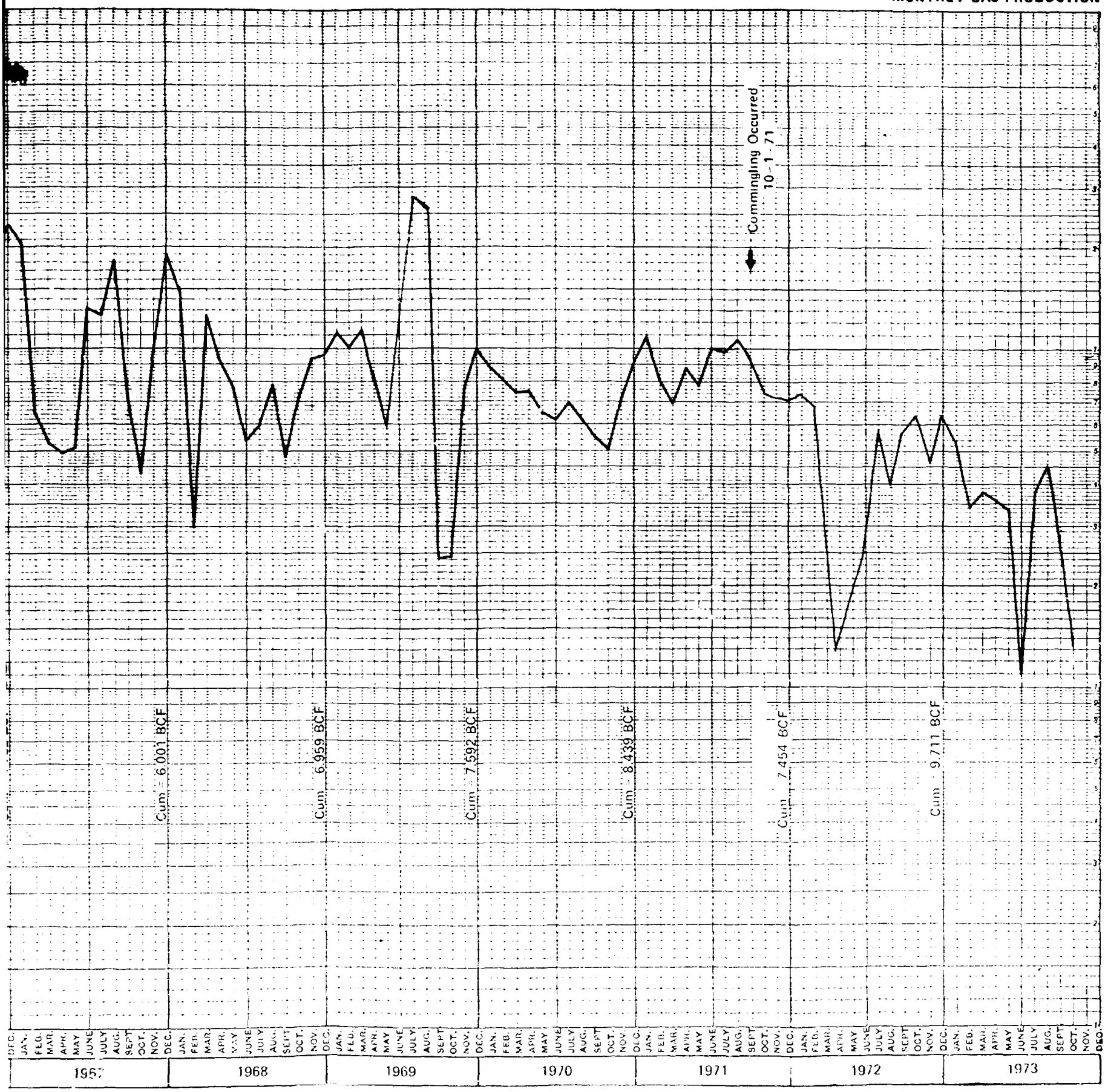


ANTELOPE RIDGE NO. 2

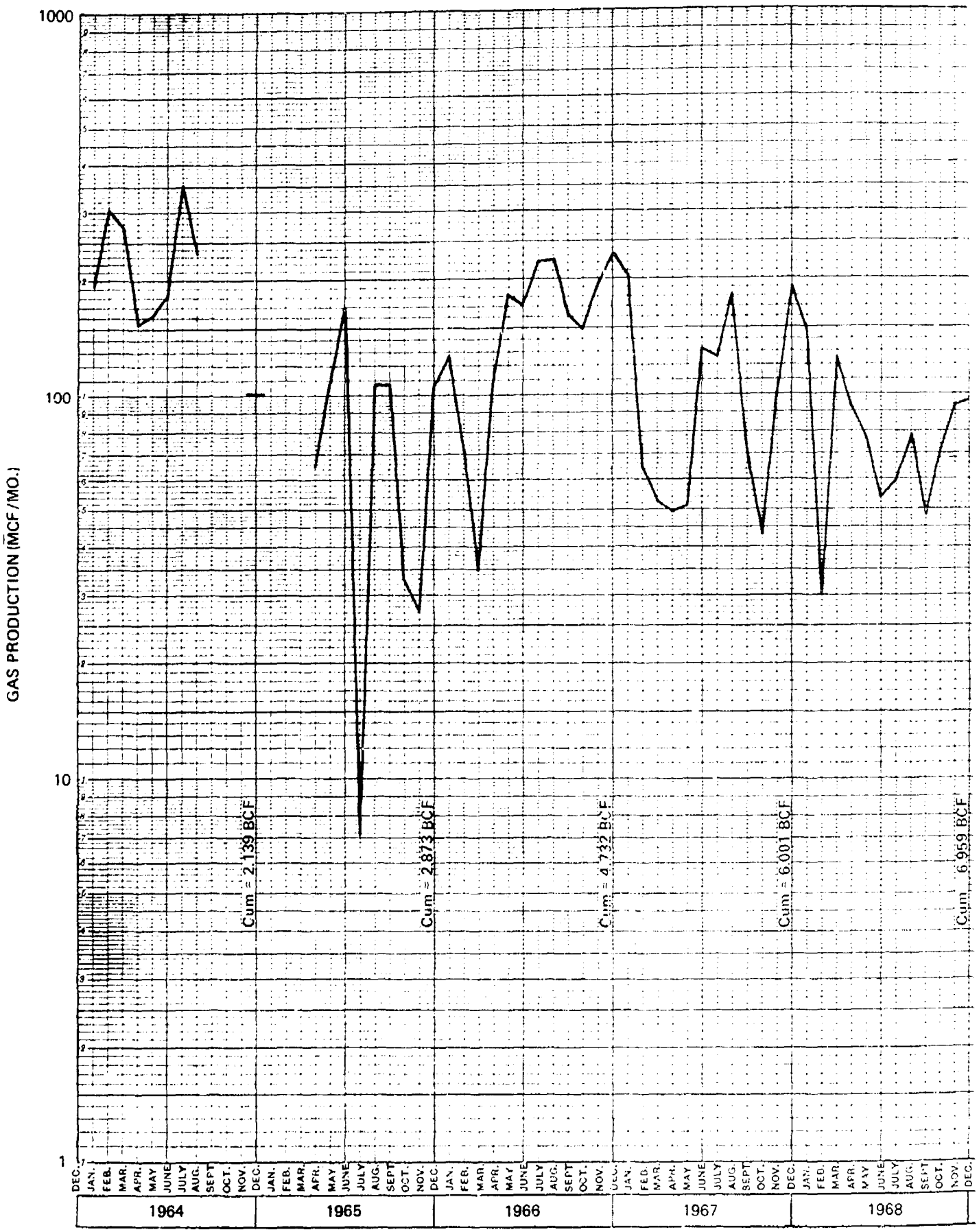


ANTELOPE RIDGE NO. 2

MORROW
MONTHLY GAS PRODUCTION

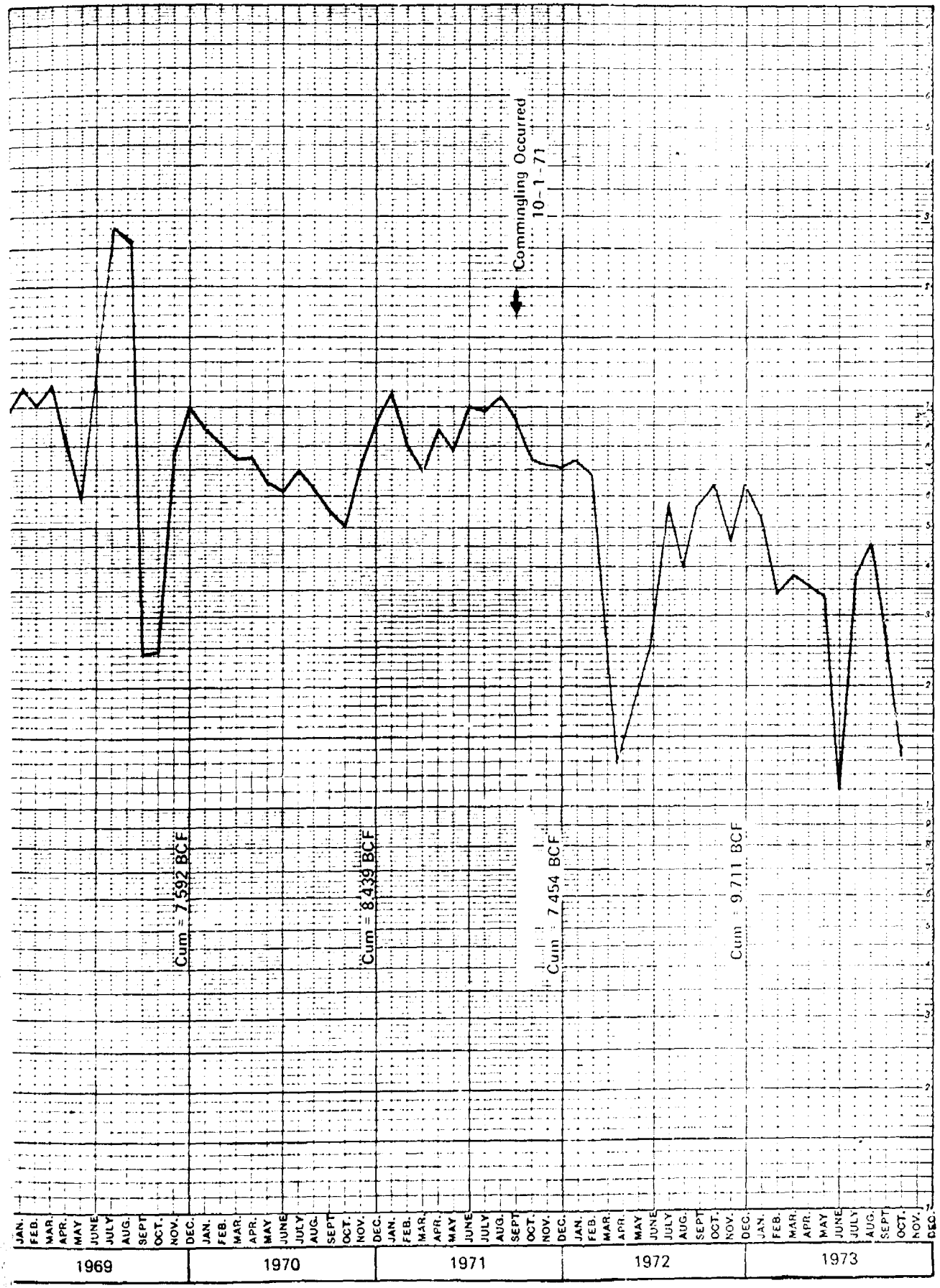


SOURCE NMOCC ANNUAL


1000
100
10
1
GAS PRODUCTION (MCF/MO.)
Cum = 2,139 BCF
Cum = 2,873 BCF
Cum = 4,732 BCF
Cum = 6,001 BCF
Cum = 6,959 BCF
DEC. JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT OCT. NOV. DEC.
1964
1965
1966
1967
1968

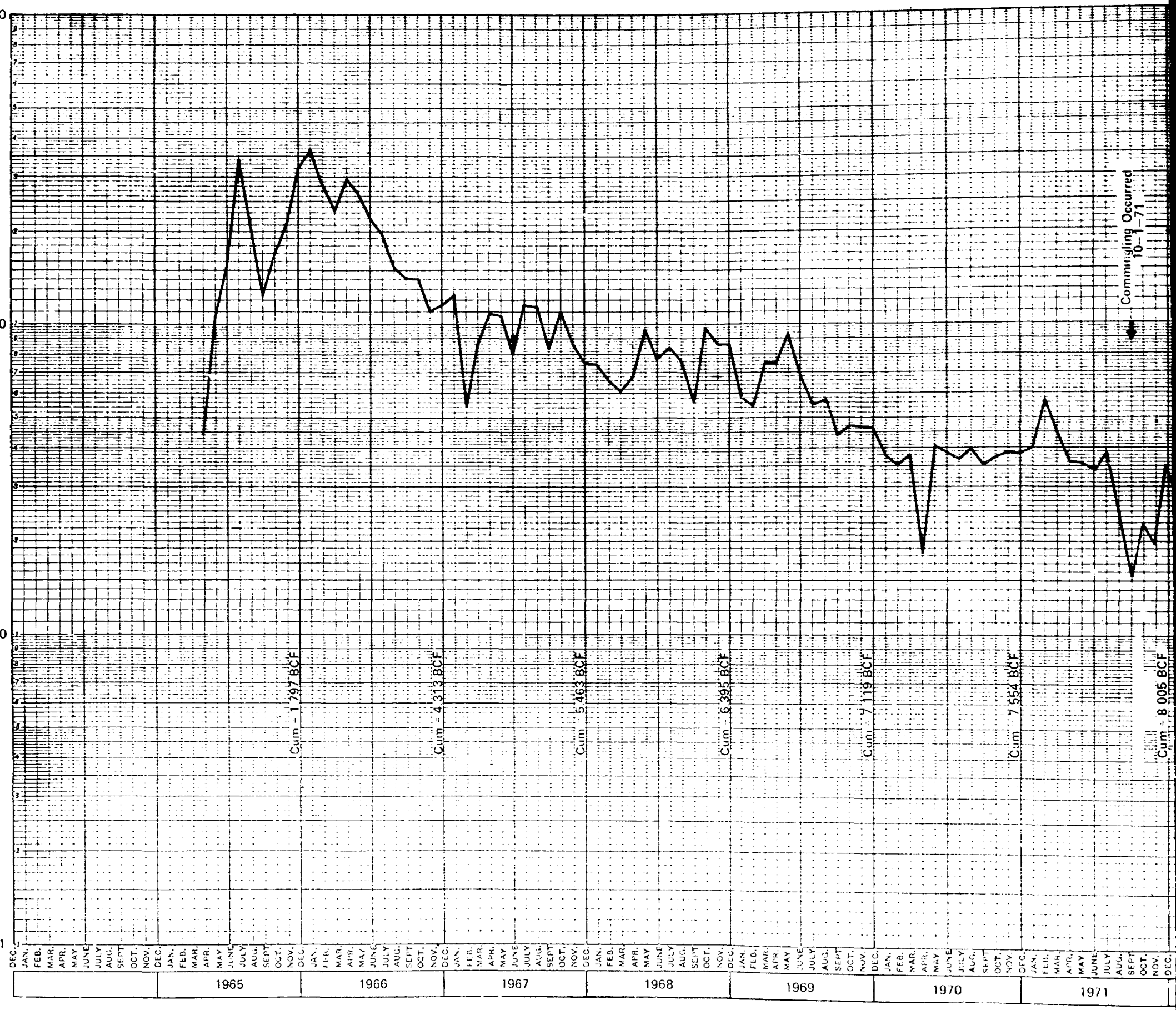
RIDGE NO. 2

MORROW
MONTHLY GAS PRODUCTION



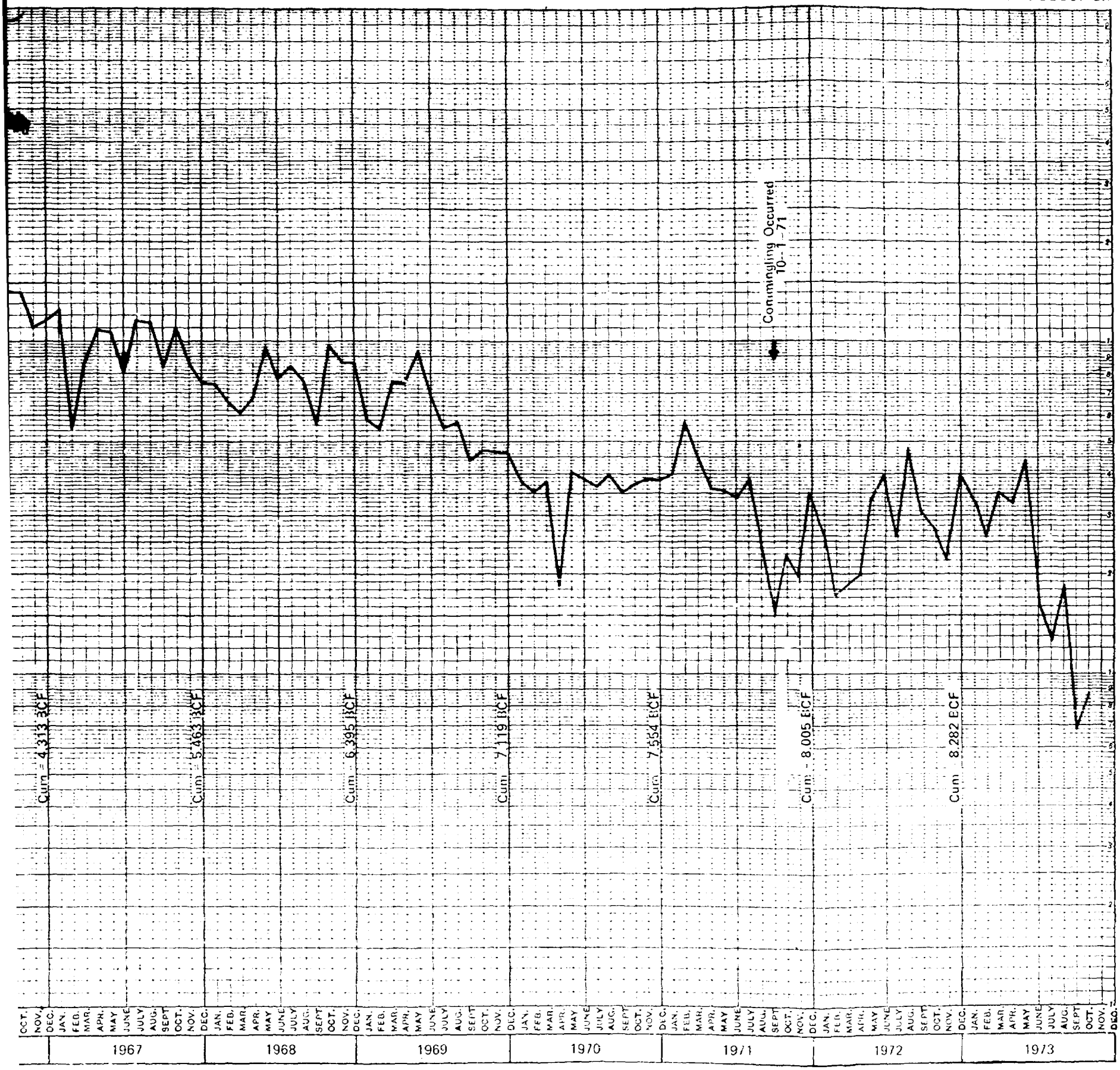
SOURCE NMOCC ANNUAL

ANTELOPE RIDGE NO. 2

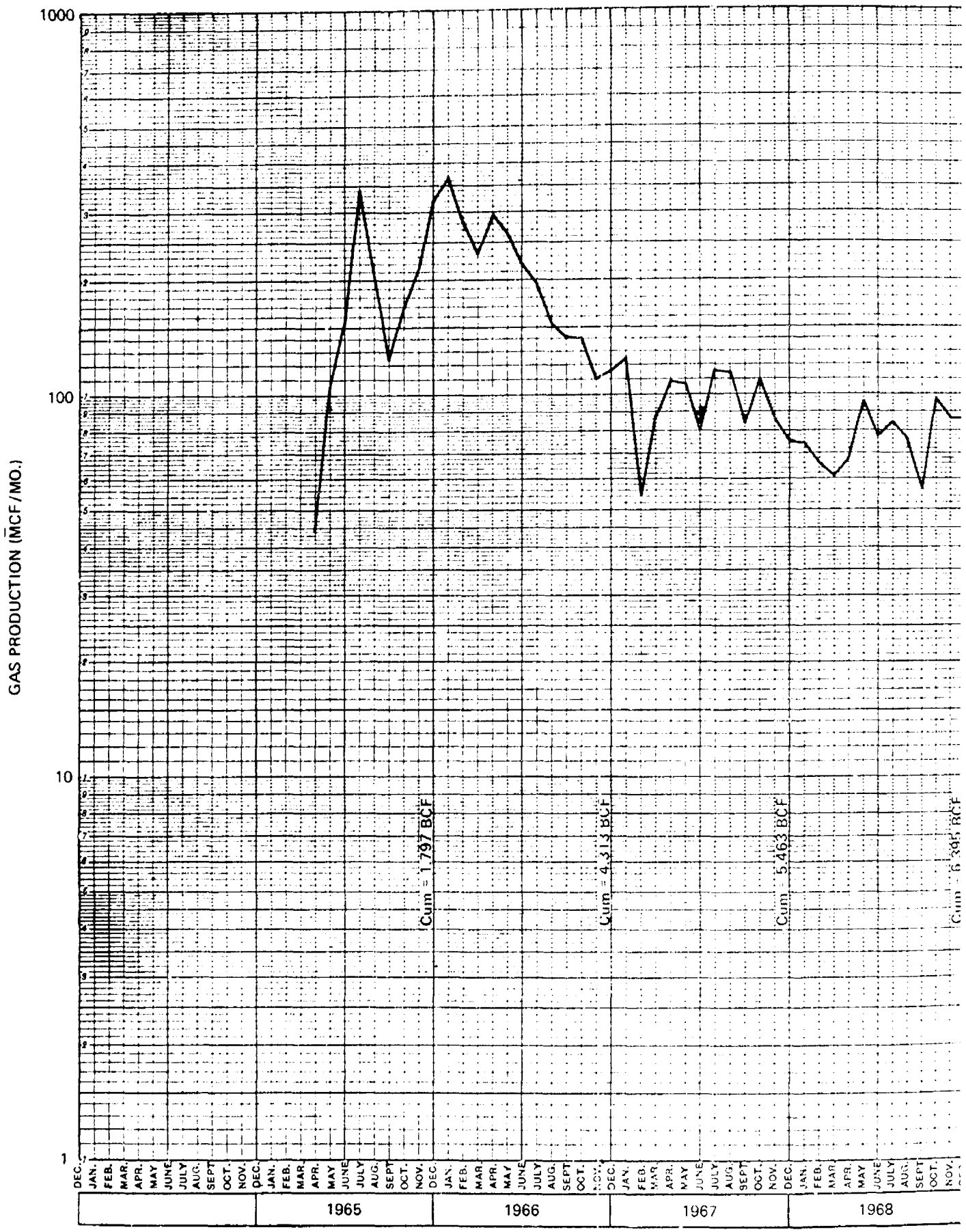


ANTELOPE RIDGE NO. 2

DEVONIAN
MONTHLY GAS PRODUCTION

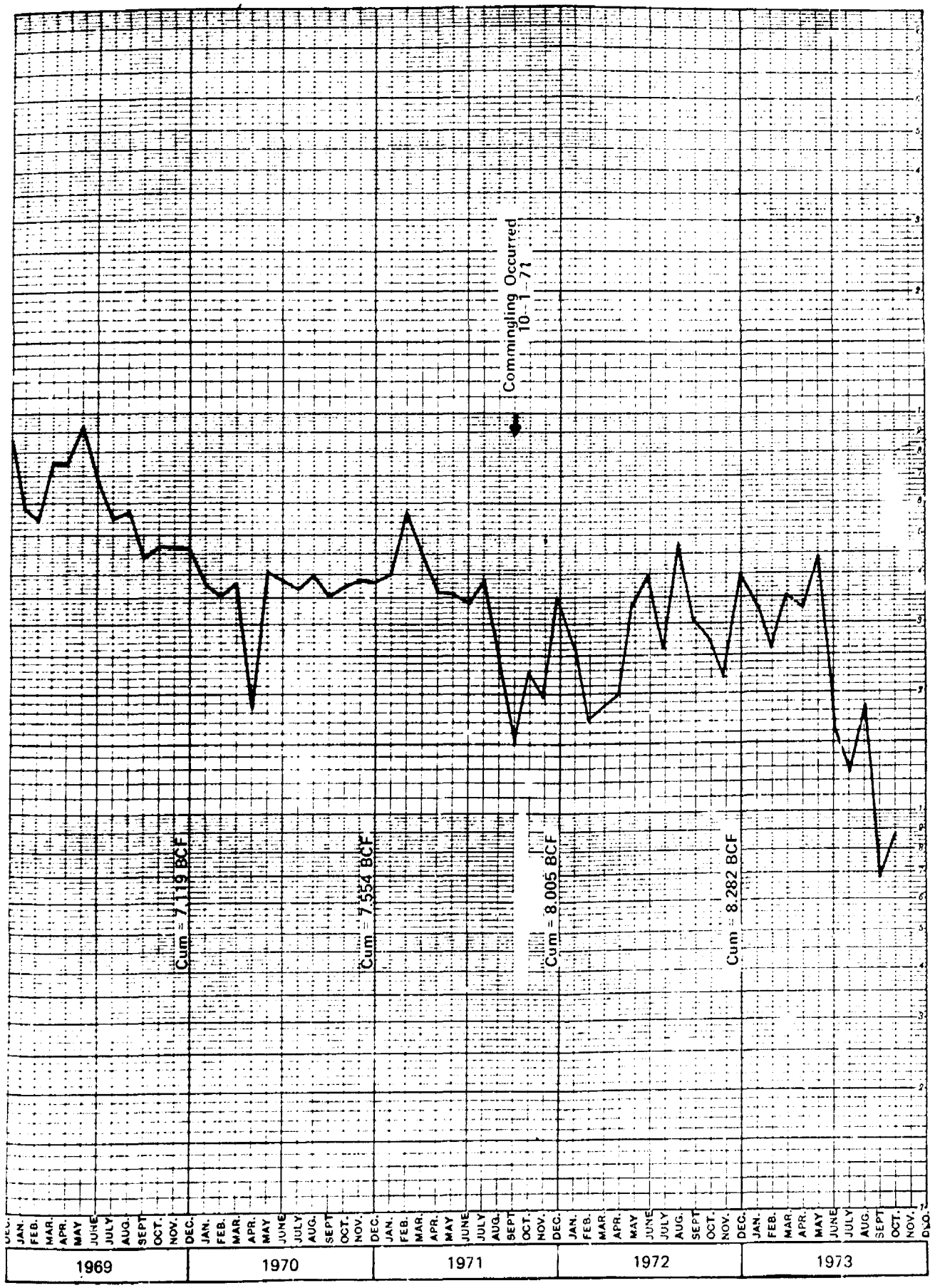


SOURCE NMOCC ANNUAL


GAS PRODUCTION (MCF/MO.)
1000
100
10
1
Cum = 1,797 BCF
Cum = 4,313 BCF
Cum = 5,463 BCF
Cum = 6,345 BCF
DEC. JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT OCT. NOV. DEC.
1965
1966
1967
1968

RIDGE NO. 2

DEVONIAN
MONTHLY GAS PRODUCTION



SOURCE NMOCC ANNUAL

TABULATION OF GAS AND CONDENSATE PRODUCTION FOR ANTELOPE RIDGE NO. 2

YEAR	MONTH	MORROW		DEVONIAN	
		GAS (MCF/Mo.)	CONDENSATE (BC/Mo.)	GAS (MCF/Mo.)	CONDENSATE (BC/Mo.)
1964	January	195,103	1,619		
	February	307,187	2,016		
	March	272,371	1,750		
	April	156,040	1,001		
	May	162,651	1,149		
	June	181,537	1,574		
	July	352,944	2,229		
	August	236,159	1,010		
	September				
	October				
	November				
	December	102,421	588		
1965	January				
	February				
	March				
	April	65,713	618	44,674	1,070
	May	109.436	312	107,432	5,727
	June	169,631	1,100	155,074	4,014
	July	7,147		341,123	8,034
	August	108,925	2,136	218,221	7,141
	September	107,127	2,130	125,904	2,985
	October	33,130	741	170,621	4,352
	November	27,270	537	212,358	5,960
	December	106,323	2,275	318,530	6,968
1966	January	128,567	2,921	362,432	8,007
	February	46,979	842	283,177	5,454
	March	34,999	816	235,831	4,866
	April	111,746	2,401	294,357	6,031
	May	181,613	1,399	261,835	5,471
	June	171,342	1,104	219,486	4,736
	July	220,591	1,149	196,625	3,434
	August	225,134	1,220	152,563	3,304
	September	162,004	853	140,733	2,651
	October	149,924	799	139,457	2,574
	November	194,738	619	111,510	2,239
	December	230,459	686	117,704	2,473
1967	January	205,932	1,124	124,292	2,760
	February	64,707	263	54,165	1,060
	March	53,294	127	87,192	2,468
	April	49,893	331	108,581	3,025
	May	51,314	25	107,782	3,503
	June	131,370	664	80,332	3,405
	July	127,161	681	117,361	2,433
	August	181,030	626	114,067	2,710
	September	70,311	818	83,806	2,040
	October	43,321		111,534	2,000
	November	101,577	609	85,606	2,267
	December	189,544	1,129	75,470	1,951

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION
Appl. EXHIBIT NO. 8
CASE NO. 5118
Submitted by Shell Oil Co.
Hearing Date Nov. 28, 1973

TABULATION OF GAS AND CONDENSATE
PRODUCTION FOR ANTELOPE RIDGE NO. 2 (CONT'D.)

YEAR	MONTH	MORROW		DEVONIAN	
		GAS (MCF/Mo.)	CONDENSATE (BC/Mo.)	GAS (MCF/Mo.)	CONDENSATE (BC/Mo.)
1968	January	148,314	538	74,734	1,674
	February	30,016	170	65,456	1,443
	March	126,864	547	60,486	2,139
	April	93,708	722	68,040	1,165
	May	77,164	660	96,710	1,294
	June	53,637	577	77,836	1,069
	July	60,566	597	84,484	1,160
	August	78,471	638	75,945	1,032
	September	48,336	795	56,409	1,107
	October	71,223	878	97,459	1,294
	November	83,639	1,067	86,451	966
	December	85,888	805	87,281	1,554
1969	January	112,695	1,308	58,099	1,183
	February	100,935	1,288	55,725	1,008
	March	114,262	1,295	75,426	1,451
	April	79,580	395	75,232	1,096
	May			93,463	1,118
	June			68,742	1,267
	July			55,524	1,135
	August			57,137	810
	September	24,108	24	44,490	1,082
	October	24,768	34	46,941	898
	November	77,515	437	46,915	530
	December	99,604	761	46,361	1,330
1970	January	88,896	741	37,901	1,060
	February	81,802	744	35,349	645
	March	73,929	605	38,101	1,019
	April	75,377	549	18,483	911
	May	64,197	479	40,713	964
	June	62,210	516	38,709	867
	July	69,308	613	36,825	943
	August	62,805	608	39,709	768
	September	55,136	547	35,114	745
	October	50,533	570	37,529	728
	November	70,993	597	38,931	781
	December	91,621	1,057	38,079	591
1971	January	109,439	661	40,265	978
	February	80,578	689	57,043	788
	March	69,764	755	44,712	874
	April	88,046	723	36,294	837
	May	78,371	681	35,634	838
	June	99,576	1,020	33,858	596
	July	98,555	937	38,666	835
	August	106,088	996	24,623	1,223
	September	91,700	1,150	15,579	50

TABULATION OF GAS AND CONDENSATE
PRODUCTION FOR ANTELOPE RIDGE NO. 2 (CONT'D)

YEAR	MONTH	MORROW		DEVONIAN	
		GAS (MCF/Mo.)	CONDENSATE (BC/Mo.)	GAS (MCF/Mo.)	CONDENSATE (BC/Mo.)
1971	October*	75,590	938	23,200	671
	November	72,937	817	20,171	247
	December	72,206	882	36,344	627
1972	January	25,442	226	19,588	174
	February	SI	---	SI	---
	March	SI	---	SI	---
	April	13,116	66	20,986	69
	May	15,993	247	26,008	402
	June	24,984	162	40,628	403
	July	57,537	230	26,694	107
	August	39,842	272	47,456	326
	September	57,461	129	31,103	70
	October	64,962	174	28,257	76
	November	47,942	421	22,772	199
	December	65,341	135	41,475	86
1973	January	54,782	254	34,774	123
	February	34,421	177	16,646	88
	March	38,845	125	38,843	125
	April	41,328	131	41,328	117
	May	34,580	159	30,888	229
	June	11,354	156	16,288	243
	July	37,277	376	13,419	136
	August	45,762	256	19,891	138

*Commingling occurred October 1, 1971.
Production allocated on basis H_2S content since commingling.

Source NMOCC Statistics

ATTACHMENT III

SUMMARY OF
ANTELOPE RIDGE UNIT NO. 2
WORKOVER COSTS

ITEM:	AMOUNT
30 Days Rig Time @ $1000/Day	$ 30,000
22 Days Pump Truck Expense @ $400/Day	12,000
14 Days Drill Pipe Rental @ $400/Day	5,600
14 Days Mud Costs @ $5/Bbl. - 250 Bbl./Day (Does not include loss circulation material)	17,500
Calcium Chloride Pill (Loss Circulation Material) and Preservatives, Ten 50-bbl. Pills @ $1,250/50-Bbl. Pill Plus $5,000 Preservatives	17,500
30 Days Blowout Preventer Rental (5000 psi Working Pressure @ $30/Day)	900
1800' - 2-7/8", 6.5# Hydril CS Tubing @ $2.50/ft.	4,700
1600' - 2-3/8", 4.7# Hydril CS Tubing @ $1.60/ft.	2,600
Packers (1 Dual Baker A-5 and 1 Model D)	6,000
Wellhead Service	1,000
Profile Nipples	1,000
Wireline Work (As Tabulated)	3,000
Fishing Tool Rentals (As Tabulated)	7,000
Tubing Hydrotesting	4,000
Water Hauling	4,000
Stimulation	8,900
200' - 2-7/8" Blast Joints	2,500
TOTAL	$125,000

BEFORE EXAMINER STAMETS
OIL CONSERVATION COMMISSION
Appl. EXHIBIT NO. 9
CASE NO. 5118
Submitted by Shell Oil Co.
Hearing Date Nov. 28, 1973

Probably to be dismissed

ATTACHMENT II

GENERAL PROGNOSIS
TO ISOLATE MORROW & DEVONIAN
ANTELOPE RIDGE NO. 2
660' FNL & 1650' FEL SEC. 4,
T-24-S, R-34-E, NMPM SURVEY,
LEA COUNTY, NEW MEXICO

OPERATION:	RIG TIME (DAYS)	FISHING TOOL RENTALS ($)	WIRELINE WORK ($)
1. Rig up and kill well.	1		
2. Cut off short string @ 9950±'.	1/6		500
3. Pull short string.	2/3		
4. Cut off long string @ 11,450±'.	1/6		500
5. Pull long string--pick up work string.	1-1/3		
6. Run overshot and jars and attempt to fish short string w/2-7/8" work string.	2/3	1,300	
a. If not successful in Step 6 above, wash over and attempt OD cut of short string @ 11,460±' and retrieve short string stub.	2	1,500	
7. Run over shot and bumper subs, latch onto long string and attempt to jar long string out.	1	900	
a. If not successful in Step 7, mill out top packer.	3	800	
8. Run free point survey in long string and cut off as deep as possible or above the free point.	1/2		1,250
9. Pull upper packer and long string.	1/2		
10. If long string has not been cut deep enough, wash over long string and OD cut just above lower packer.	2	1,500	
11. Pluck lower packer.	1-1/3	1,000	
12. Retrieve lower packer.	1/6		
13. Set Model D packer with knockout plug at 13,500±'.	1/2		500
14. Run A-5 Baker packer on long string to 12,800±'. Pressure test long string connections above slips hydraulically to 6000 psi. Run tail pipe to 14,500' and latch in long string to lower packer and set 4000# on Model D.	1		
15. Run short string and sting into dual packer--pressure test short string connections above slips hydraulically to 8000 psi. Land short string with 5000# compression.	1		

ATTACHMENT II, CONTINUED

OPERATION:	RIG TIME (DAYS)	FISHING TOOL RENTALS ($)	WIRELINE WORK ($)
16. Remove BOPS and install wellhead.	1/4		
17. Circulate annulus with inhibited fresh water.	1/4		
18. Run wireline standing valve and set upper packer with 1400 psi pressure @ surface.	1/4		250
19. Retrieve standing valve.			
20. Place well on production.			
Treating Morrow	3 1/4		
Squeezing Devonian-Drill out, Perf, and Acidize	9		
	30		

Set for Hearing Nov. 28

SHELL OIL COMPANY

PETROLEUM BUILDING
P.O. BOX 1509
MIDLAND, TEXAS 79701

September 11, 1973

Subject: Antelope Ridge Unit
(No. 14-08-0001-8492)
Lea County, New Mexico
Commingling Extension Request

Case 5118

Oil and Gas Supervisor
United States Geological Survey
Post Office Drawer 1857
Roswell, New Mexico 88201

Commissioner of Public Lands
State of New Mexico
Post Office Box 1148
Santa Fe, New Mexico 87501

Oil Conservation Commission
State of New Mexico
Post Office Box 871
Santa Few, New Mexico 87501

Gentlemen:

Shell Oil Company, in behalf of itself and partners, respectfully requests that the temporary commingling permit (R-4289), expiring October 17, 1973, be extended until Antelope Ridge Unit 2 is depleted. Production would continue to be allocated on the basis of H_2S content as approved in April 1972. As a result of attempting to resolve the commingling problem, two wells now share the same proration unit. As both wells are at a near marginal producing status, we propose sharing the Morrow proration unit with Unit Well 4.

Data pertaining to the commingling and subsequent workover problems are contained in considerable correspondence beginning in March 1972. Since our most recent letter dated April 18, 1972, the Morrow in the replacement well, ARU 4, has been fracture treated with disappointing results. Maximum capacity still remains at ±700 MCF/D and it does not appear that it will be possible to effect reservoir communication with the zone producing in ARU 2.

Due to mechanical conditions that resulted in downhole commingling, production from the Morrow and Devonian in ARU 2 is currently allocated on the basis of H_2S content. Comparison of the combined stream with a single zone Devonian (sour) gas well is made monthly to determine the amount of dilution and, in turn, the percentage of Morrow gas being produced. Attached are updated data showing the gas analysis and production curves showing the results of the allocation method.

To date, expenses to correct the commingling in ARU 2 total $42,000. An additional $453,000 has been spent in deepening ARU 4 to the Morrow in an effort to create a replacement drainage point that would permit abandonment of the zone in ARU 2.

DOCKET MAILED

Date 11-16-73

Briefly, we make the request to continue commingling for the following reasons:

1. A no-trouble repair of ARU 2 is estimated to cost an additional $105,000. From experience in the deep gas wells in this area, the cost could easily double.

2. Experience has also shown that the chances of damaging the Morrow formation with workover fluids are not only possible but probable. The net result would be loss of valuable reserves.

3. In its present condition, pressures are contained below packers and the present producing method is relatively safe. Because of lost circulation problems encountered in previous workover attempts, a safety and potential fire hazard exists if workover efforts are pursued.

4. The wells and zones involved are either marginal now or approaching marginal status. The combined stream from the Devonian and two Morrow zones is less than four million cubic feet per day. Well No. 4 has a maximum capacity of 740 MCF gas per day and makes four barrels condensate and four barrels water while the commingled well that includes the water-drive Devonian zone produces gas at the rate of three million cubic feet per day and 23 barrels condensate plus 25 barrels water. Both wells are producing into the 520 psi gathering system.

5. Shell operates the only Devonian wells on the small closure at Antelope Ridge; however, the field now has an additional operator in the Atoka and Morrow zones. From the data obtained from reservoir interference tests in ARU 2 and 4 that are located some 800 feet apart, it is doubtful that commingled production would change or be influenced by production from the new offset well.

6. The Morrow and Devonian reserves in the subject wells are either marginal or approaching the advanced stages of depletion.

Since a high risk of failure accompanied by an expensive workover is present, we recommend that our request for permanent commingling on Antelope Ridge Unit 2 be approved.

Very truly yours,

Shell Oil Company
Unit Operator

W. J. Quezta

for Jack L. Mahaffey
Production Manager
MId-Continent Division

RWK:LA

Attachments

Case 5-118

H_2S CONTENT OF GAS (GRAIN/100 SCF) ANTELOPE RIDGE FIELD AUGUST 31, 1973

DATE	WELL NO. 2	WELL NO. 3	DEV GAS IN COMMINGLED STREAM WELL NO. 2
3-31-72	-	579.22	-
4-02-72	-	502.69	-
4-04-72	-	565.50	-
4-25-72	220.06	447.93	.49
5-22-72	273.00	436.00	.63
6-15-72	286.46	401.20	.71
7-20-72	250.36	458.68	.55
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10-18-72	120.24	397.80	.30
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2-13-73	89.90	270.00	.33
3-15-73	185.40	370.82	.50
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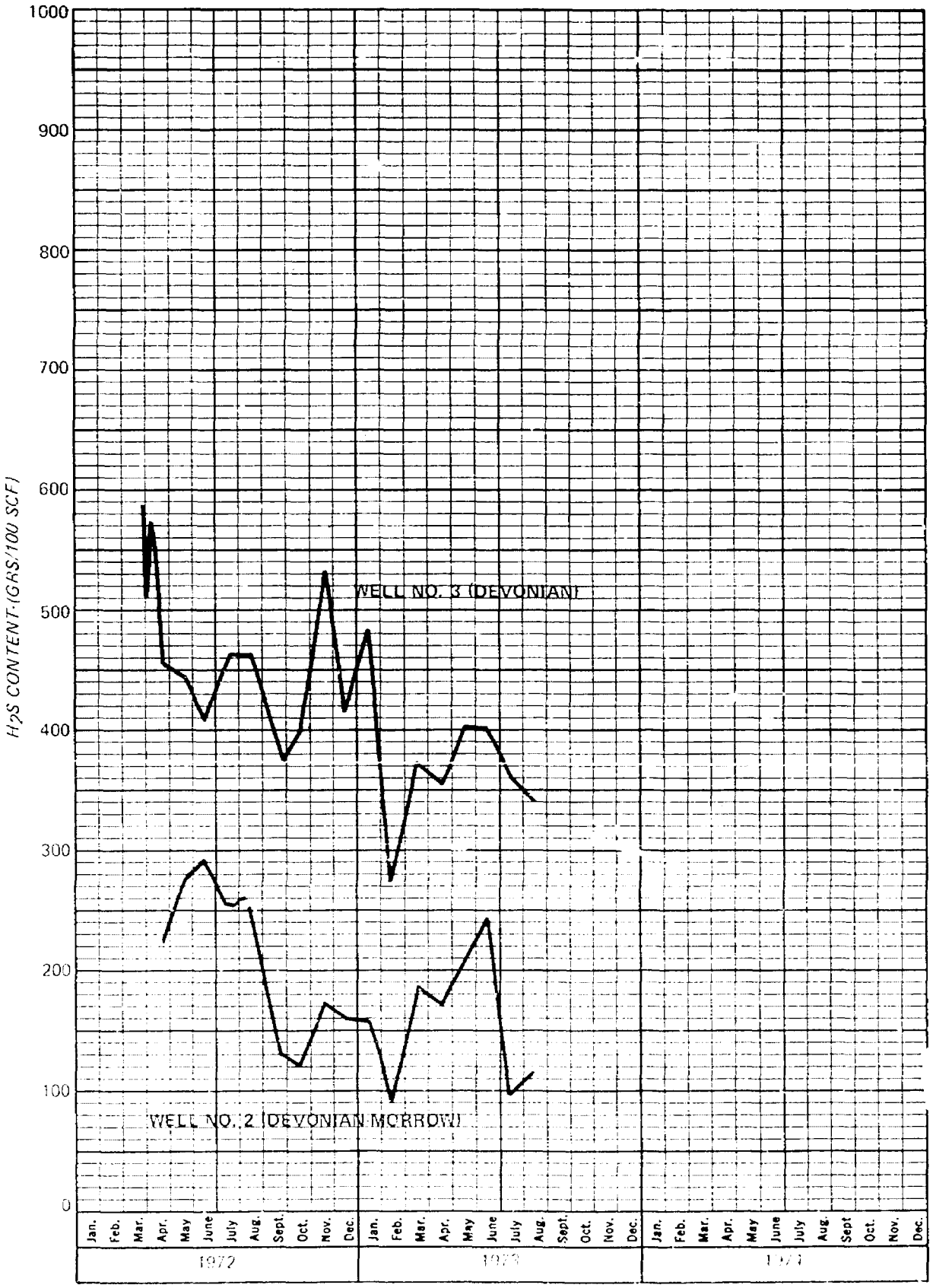
5-15-73	200.34	399.82	.50
6-15-73	242.14	398.06	.61
7-15-73	94.26	355.04	.26
8-18-73	118.44	335.28	.35

NOTE: NMOCC approved allocation of Morrow and Devonian production from Well No. 2 based upon H_2S content of Well No. 3 on April 17, 1973

H_2S CONTENT
ANTELOPE RIDGE FIELD
AUGUST 31, 1973



Case 5118

DRAFT

dr/

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 5118

Order No. R-4289-A

APPLICATION OF SHELL OIL COMPANY
FOR AN EXTENSION OF ORDER NO. R-4289,
LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on December 3, 1973, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this _____ day of December, 1973, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

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

(2) That Shell Oil Company seeks an extension of the downhole commingling authority granted by Order No. R-4289 for applicant's Antelope Ridge Well No. 2, located in Unit B of Section 4, Township 24 South, Range 34 East, NMPM, Antelope Ridge Field, Lea County, New Mexico.

(3) That pursuant to the authority granted by Order R-2797 the subject well was completed as a dual completion (Conventional) to produce gas from the Antelope Ridge-Morrow Penn-Aluminum and the Antelope Ridge-Devonian Gas Pools.

(4) That communication between the two zones developed in the Fall of 1971 due to mechanical difficulties.

~~(3) That downhole commingling resulted from mechanical difficulties.~~

(5) That the applicant has expended substantial sums and diligent effort to remedy or alleviate the situation to no avail.

(6) That one or both of the producing zones might be lost or damaged during further workover operations.

(7) That the method of allocating production to each of the commingled zones upon the basis of the H_2S content of the commingled stream will protect correlative rights.

(8) That approval of the subject application will prevent waste and protect correlative rights.

IT IS THEREFORE ORDERED:

(1) That the applicant, Shell Oil Company, is hereby authorized an ~~indefinite~~ extension of Order No. R-4289, which order authorized temporary downhole commingling of the Morrow Pennsylvanian and Devonian production in the wellbore in its Antelope Ridge Well No. 2, located in Unit B of Section 4, Township 24 South, Range 34 East, Antelope Ridge Field, Lea County, New Mexico, until further order of the Commission.

(2) That ~~the commingled production~~ 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.

(7) That the proposed reservoir characteristics of the Antelope Ridge Morrow Pennsylvanian and Antelope Ridge Devonian zones in the subject well are such that underground waste would not be caused by a continuation of the commingling in the wellbore.