

CASE 3259: Application of MIDWEST
OIL CORP. for creation of 2 new
oil pools and special rules.

Readvertised to June 9th E.L. Fearing

CASE No.
3251

Application,
Transcripts,
Small Exhibits
ETC.

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. 3259
Order No. R-2929
NOMENCLATURE

APPLICATION OF MIDWEST OIL CORPORATION
FOR THE CREATION OF TWO NEW OIL POOLS,
AND FOR SPECIAL POOL RULES, LEA COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on June 9, 1965, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 15th day of June, 1965, 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, Midwest Oil Corporation, seeks the creation of two new oil pools for Pennsylvanian production for its dually completed State "C" Well No. 1 located in Unit K of Section 32, Township 13 South, Range 34 East, NMPM, Lea County, New Mexico, and the promulgation of special rules and regulations for said pools, including provision for 160-acre spacing units and fixed well locations.

(3) That said State "C" Well No. 1 has discovered a separate common source of supply which should be designated the Nonombre-Upper Pennsylvanian Pool; that the vertical limits of said pool should be the zone encountered in said well between

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10,344 and 10,360 feet; and that the horizontal limits of said pool should be the SW/4 of Section 32, Township 13 South, Range 34 East, NMPM, Lea County, New Mexico.

(4) That said State "C" Well No. 1 encountered a separate common source of supply which should be designated the Nonombre-Lower Pennsylvanian Pool; that the vertical limits of said pool should be the zone encountered in said well between 10,694 and 10,719 feet; and that the horizontal limits of said pool should be the SW/4 of Section 32, Township 13 South, Range 34 East, NMPM, Lea County, New Mexico.

(5) That in order to prevent the economic loss caused by the drilling of unnecessary wells, to avoid the augmentation of risk arising from the drilling of an excessive number of wells to prevent reduced recovery which might result from the drilling of too few wells, and to otherwise prevent waste and protect correlative rights, temporary special rules and regulations providing for 160-acre spacing units should be promulgated for the Nonombre-Upper Pennsylvanian Pool and the Nonombre-Lower Pennsylvanian Pool.

(6) That the temporary special rules and regulations should provide for limited well locations in order to assure orderly development of the pools and protect correlative rights.

(7) That the temporary special rules and regulations should be established for a one-year period in order to allow the operators in the subject pools to gather reservoir information to establish the area that can be efficiently and economically drained and developed by one well.

(8) That this case should be reopened at an examiner hearing in July, 1966, at which time the operators in the subject pools should be prepared to appear and show cause why the Nonombre-Upper Pennsylvanian Pool and the Nonombre-Lower Pennsylvanian Pool should not be developed on 40-acre spacing units.

IT IS THEREFORE ORDERED:

(1) That a new pool in Lea County, New Mexico, classified as an oil pool for Upper Pennsylvanian production, is hereby created and designated the Nonombre-Upper Pennsylvanian Pool

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with vertical limits comprising the zone encountered in the Midwest Oil Corporation State "C" Well No. 1 located in Unit K of Section 32, Township 13 South, Range 34 East, NMPM, Lea County, New Mexico, between the interval from 10,344 to 10,360 feet, and horizontal limits comprising the SW/4 of Section 32, Township 13 South, Range 34 East, NMPM, Lea County, New Mexico.

(2) That a new pool in Lea County, New Mexico, classified as an oil pool for Lower Pennsylvanian production, is hereby created and designated the Nonombre-Lower Pennsylvanian Pool with vertical limits comprising the zone encountered in said State "C" Well No. 1 between 10,694 feet and 10,719 feet, and horizontal limits comprising the SW/4 of Section 32, Township 13 South, Range 34 East, NMPM, Lea County, New Mexico.

(3) That temporary Special Rules and Regulations for the Nonombre-Upper Pennsylvanian Pool and for the Nonombre-Lower Pennsylvanian Pool are hereby promulgated as follows:

SPECIAL RULES AND REGULATIONS
FOR THE
NONOMBRE-UPPER PENNSYLVANIAN POOL
AND THE
NONOMBRE-LOWER PENNSYLVANIAN POOL

RULE 1. Each well completed or recompleted in the Nonombre-Upper Pennsylvanian Pool or in the Upper Pennsylvanian formation within one mile thereof, and not nearer to or within the limits of another designated Upper Pennsylvanian oil pool, shall be spaced, drilled, operated, and produced in accordance with the Special Rules and Regulations hereinafter set forth.

Each well completed or recompleted in the Nonombre-Lower Pennsylvanian Pool or in the Lower Pennsylvanian formation within one mile thereof, and not nearer to or within the limits of another designated Lower Pennsylvanian oil pool, shall be spaced, drilled, operated, and produced in accordance with the Special Rules and Regulations hereinafter set forth.

RULE 2. Each well shall be located on a standard unit containing 160 acres, more or less, comprising a governmental quarter section.

RULE 3. The Secretary-Director of the Commission may grant an exception to the requirements of Rule 2 without notice and

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hearing when an application has been filed for a non-standard unit consisting of less than 160 acres or the unorthodox size or shape of the tract is due to a variation in the legal subdivision of the United States Public Land Surveys. All operators offsetting the proposed non-standard unit shall be notified of the application by registered or certified mail, and the application shall state that such notice has been furnished. The Secretary-Director may approve the application upon receipt of written waivers from all offset operators or if no offset operator has entered an objection to the formation of the non-standard unit within 30 days after the Secretary-Director has received the application.

RULE 4. Each well shall be located within 150 feet of the center of either the northeast quarter or the southwest quarter of a governmental quarter section.

RULE 5. The Secretary-Director may grant an exception to the footage requirements of Rule 4 without notice and hearing when an application has been filed for an unorthodox location necessitated by topographical conditions or the recompletion of a well previously drilled to another horizon, provided the well will be located no nearer than 330 feet to the outer boundary of the unit. All operators offsetting the proposed unorthodox location shall be notified of the application by registered or certified mail, and the application shall state that such notice has been furnished. The Secretary-Director may approve the application upon receipt of written waivers from all offset operators or if no offset operator has entered an objection to the unorthodox location within 20 days after the Secretary-Director has received the application.

RULE 6. A standard proration unit (158 through 162 acres) shall be assigned a 160-acre proportional factor of 7.67 for allowable purposes, and in the event there is more than one well on a 160-acre proration unit, the operator may produce the allowable assigned to the unit from the wells on the unit in any proportion.

The allowable assigned to a non-standard proration unit shall bear the same ratio to a standard allowable as the acreage in such non-standard unit bears to 160 acres.

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IT IS FURTHER ORDERED:

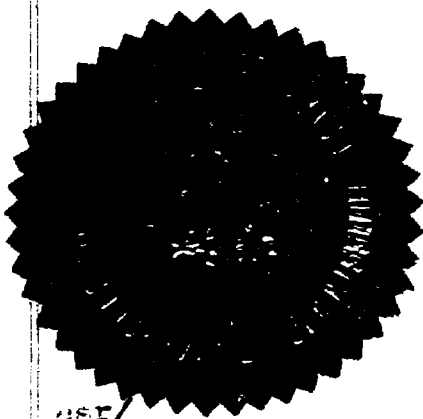
(1) That any well presently drilling to or completed in the Nonombre-Upper Pennsylvanian Pool or in the Upper Pennsylvanian formation within one mile thereof and any well presently drilling to or completed in the Nonombre-Lower Pennsylvanian Pool or in the Lower Pennsylvanian formation within one mile thereof that will not comply with the well location requirements of Rule 4 is hereby granted an exception to the requirements of said rule. The operator shall notify the Hobbs District Office of the Commission in writing of the name and location of the well on or before July 1, 1965.

(2) That each well presently drilling to or completed in the Nonombre-Upper Pennsylvanian Pool or in the Upper Pennsylvanian formation within one mile thereof and any well presently drilling to or completed in the Nonombre-Lower Pennsylvanian Pool or in the Lower Pennsylvanian formation within one mile thereof shall receive a 40-acre allowable until a Form C-102 dedicating 160 acres to the well has been filed with the Commission.

(3) That this case shall be reopened at an examiner hearing in July, 1966, at which time the operators in the subject pools may appear and show cause why the Nonombre-Upper Pennsylvanian Pool and the Nonombre-Lower Pennsylvanian Pool should not be developed on 40-acre spacing units.

(4) 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

Jack M. Campbell
JACK M. CAMPBELL, Chairman

Guyton B. Hays
GUYTON B. HAYS, Member

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

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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
July 19, 1966

EXAMINER HEARING

IN THE MATTER OF: Case No. 3259 being reopened
pursuant to the provisions of Order No.
R-2929, which order established 160-acre
spacing units for the Nonombre-Upper Pennsyl-
vanian and Nonombre-Lower Pennsylvanian
Pools, Lea County, New Mexico, for a period
of one year.

Case No. 3259

BEFORE: ELVIS A. UTZ, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: Case Number 3259.

MR. HATCH: In the matter of Case No. 3259 being reopened pursuant to the provisions of Order No. R-2929, which order established 160-acre spacing units for the Nonombre-Upper Pennsylvanian and Nonombre-Lower Pennsylvanian Pools, Lea County, New Mexico, for a period of one year.

MR. MORRIS: I'm Dick Morris of Seth, Montgomery, Federici and Andrews, Santa Fe, appearing on behalf of Midwest Oil Corporation in support of the existing rules and regulations in the pool.

MR. UTZ: Are there other appearances?

(Witnesses sworn.)

* * *

N O R B E R T M c I N T Y R E, called as a witness herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. MORRIS:

Q Mr. McIntyre, will you please state your name, where you reside, by whom you are employed, and in what capacity?

A My name is Norbert McIntyre. I reside in Midland, Texas, I am employed as a geologist by Midwest Oil Corporation.

Q Have you previously testified before the New Mexico

Oil Conservation Commission or one of its Examiners and had your qualifications as a geologist accepted as a matter of record?

A Yes, sir, I have.

Q Are you familiar with the geology in the Nonombre-Upper and Lower Pennsylvanian Pools in Lea County, New Mexico?

A Yes, I am.

MR. MORRIS: Are the witness' qualifications acceptable?

MR. UTZ: Yes, they are.

(Whereupon, Exhibit 1A marked for identification.)

Q (By Mr. Morris) Mr. McIntyre, if you would refer first to what we have marked as Exhibit 1A in this case --

MR. MORRIS: Here, I might add, Mr. Examiner, we have marked all of our Exhibits with an A to differentiate them from the Exhibits in the original case.

MR. UTZ: All right.

Q (By Mr. Morris) Referring to Exhibit 1A, would you state what it is and what it shows, please?

A Exhibit 1A is simply a location plat showing the area surrounding Nonombre Field and within the field itself the zones presently producing in those wells.

Q I ask you first, is Midwest Oil Corporation the

operator of all of the producing wells in both the Nonombre Upper and Lower Pennsylvanian Pools?

A Yes, they are.

Q Would you point out, with reference to this Exhibit 1A, the general location of all the producing wells, point out what zones they are completed in, and give a brief history of the development of these two pools?

A Our discovery well, our Number 1 C well, which is in the northeast southwest of Section 32 is completed from both the Upper -- it's dually completed from the Upper and Lower Pennsylvanian. Subsequent to that well, we drilled the 1 D State also in Section 32 in the southwest northeast, which is currently producing from the Upper Pennsylvanian alone.

A subsequent well to that was the 2 D, which was completed from the Lower Pennsylvanian, and it's located in the northeast northwest of Section 32. The most recent well drilled by Midwest in the area was the Number 1 Harris State, which is located in the southeast southwest Section 29, and directly north of the 2 D state. This well did not encounter commercial quantities of oil.

Q What is its present status?

A The present status on this well is a water disposal well for the other three wells in the pool. Subsequent to our 1 C discovery well, Ralph Lowe drilled ANWO State Well Number

1 in the northwest northeast of Section 5, which is immediately south of the pool, and subsequent wells drilled to that in order were the Cactus Number 1 State in the southeast southeast Section 30; then the Phillips Dye Number 1 B, southwest southwest of Section 28; and a well which was drilled back in the middle 50's, the Gulf Number 1 Bettenbough, which is in the southeast southwest of Section 20, approximately one mile to the north.

Q And the wells, the four wells that you have just referred to are as indicated on the plat not producing from either the Upper or Lower Pennsylvanian zones?

A That's correct.

(Whereupon, Exhibit 2A marked for identification.)

Q (By Mr. Morris) If you would refer next to Exhibit Number 2A, would you state what it is and the pertinent features of that Exhibit?

A Exhibit 2A is a log section which will run, as you will see at the base of the section on the land plat, from the Ralph Lowe Well to the south of the field immediately through the three producing wells, and to the Midwest Number 1 Harris State in southeast southwest of 29, which is the most recent well in the area and was completed in April of '66, as a dry hole.

Basically, this illustrates the zonation as we have set it out and the zones which are producing in these wells as designated by perforations in the depth columns of each log in the section.

Also, immediately above the depth column, you will see the date these wells were completed and the zones they were completed from.

Q From this Exhibit, Mr. McIntyre, does it show what is designated as the Upper Pennsylvanian, the producing formation there is the Bough B formation?

A That is correct. The Bough B zone, as this nomenclature that we have followed here, is the nomenclature that is set up by the Commission Office in Hobbs, the formation of the Bough limestone.

Q And with respect to the Lower Pennsylvanian, that is what you have called the Ranger Lake here on your cross section?

A Yes. That is the correlative zone to the Ranger Lake pay zone six miles to the northeast.

Q In your opinion, are the two producing formations continuous throughout the producing area of this pool?

A Yes, they certainly appear to be.

Q That would be shown from this Exhibit?

A Yes, correct.



Q Would this Exhibit also show the separation between these two zones?

A Yes, I believe it would, by pressure information and by lithology shown on the log between the zones.

Q By the pressure information, you are referring to the drill stem test information as shown on this Exhibit?

A Yes. That's correct. One point which will be brought up later on in the testimony, not as drill stem test data but I think is pertinent in this case; if you will refer to the Midwest Number 1 C Well, which is the second well from the right on the section, and the test interval across the producing zone, we find that our shutin pressures across -- the virgin pressures across that zone were in the magnitude of 3684 to 3870 pounds. This well being completed in May, '65, the most recent producer completed in the field from that zone, the correlative zone; the Midwest Number 2 D which is the second well on the left-hand side of the cross section, we drill stem tested that zone again and found that our pressures were in the range of 2201 to 2328 pounds on that drill stem test across the correlative interval, which would indicate a considerable pressure drawdown between those two wells within a period of seven months.

Q This was after considerable production from the discovery well?

A That's correct.

(Whereupon, Exhibit 3A marked for identification.)

Q (By Mr. Morris) Referring next to what has been marked Exhibit 3A, state what that is.

A Exhibit 3A is a local plat on the Nonombre Field, the datum on the plat being the top of the Bough lime, and it shows relationships, structural relationships between the three producing wells and the outlying wells on the flank which were non-commercial.

Q Would it be correct to say that this structure shows a limited reservoir for the Upper Pennsylvanian pay zone?

A That's correct. It shows a reservoir which apparently is limited considerably areally and most likely indicates also a thin oil column across this limited feature.

Q Do you also have a structure plat for the Lower Pennsylvanian?

(Whereupon, Exhibit 4A marked for identification.)

A Yes. Exhibit 4A, which is basically the same thing, illustrating as shown on the log, sample log to the left of the plat, a sub-surface illustration map on the Ranger pay zone which is the lower pay zone in the field.

Q Actually, there's not a great deal of difference between the appearance of the structure for the two zones

except for the depth at which they're located?

A That's correct. This shows practically the same type feature, same size.

Q Were Exhibits 1A through 4A prepared by you or under your direction, Mr. McIntyre?

A Yes, sir, they were.

MR. MORRIS: We move the introduction of Applicant's Exhibits 1A through 4A into evidence.

MR. UTZ: Without objection they will be entered into the record of this case.

(Whereupon, Exhibits 1A through 4A offered and admitted into evidence.)

MR. MORRIS: That's all we have from this witness, Mr. Examiner. We will have an engineering witness to testify with respect to other matters in the case.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. McIntyre, what type of drive do these pools have, have you determined that?

A Apparently, from engineering data that we'll see later, our upper zone is gas solution, the lower zone water drive.

Q Referring to your Exhibit 4A, your upper completion is -- well, between 66 and 6550 countour and the dry hole is

almost on contour with that in Section 29, is that correct?

A Yes, that's correct.

Q And the upper zone is a gas solution drive. What kind of an explanation do you have for the same contour being productive at a point about half a mile from your dry hole? Is it a permeability situation?

A I think the problem here is a local permeability problem, wherein you have a fractured type reservoir and local permeability barriers and -- possibly this is a hypothetical thing, but it's one explanation for what we have here -- I think we probably have a tilted feature, wherein the crest of this anticlinal, depicted anticline here is somewhat down-dip from the original location. In other words, we have what amounts to a tilted water table caused by a tilting, subsequent to this tilting of this anticline, sometime subsequent. This is an explanation that we run into quite frequently in dealing with the Pennsylvanian through this part of the country.

It seems in several cases, for no structural reason, you have a well that might be flat, or very slightly high to a dry hole which is making 100 per cent water, and a well will be in a position similar flowing oil. This seems to be the only explanation that can be made, the only sensible explanation for it.

We are about 31 feet high in the 1 D to the Harris

State, on top of the Ranger zone. Both of these wells, if we're looking at Exhibit 4 A, were wet in the Ranger zone, but in the upper zone we're looking at 32 feet of vertical separation between the 1 D and the Harris State.

The Harris State made oil and water on a drill stem test and was -- we attempted completion from it, and we didn't make any considerable amount of oil from the zone we tested. So, it would appear that those, that that is the situation in this case.

Q Do you think the 1 D Well has 160 productive acres?

A If this is the case it could potentially have, pulling from a considerable area over there and maybe oh, for example, a foot or two of oil column on top of water.

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

MR. MORRIS: No, I have nothing further.

MR. UTZ: The witness may be excused.

(Witness excused.)

* * *

B I L L B A K E R, called as a witness herein, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. MORRIS:

Q Mr. Baker, will you please state your name, where

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you reside, by whom you are employed and in what capacity?
A Bill Baker, I am employed by Midwest Oil Corporation in Midland, Texas as petroleum engineer.

Q Have you previously testified before the New Mexico Oil Conservation Commission or one of its Examiners and had your qualifications as an engineer established as a matter of record?

A Yes, I have.

Q Are you familiar with the Nonombre Upper and Lower Pennsylvanian Pools, Lea County, New Mexico?

A Yes, I am.

MR. MORRIS: Are the witness' qualifications acceptable?

MR. UTZ: Yes, they are.

Q (By Mr. Morris) Mr. Baker, before going into further Exhibits, could you state what the current rate of production from the Number 1 D Well is in the Upper Pennsylvanian Pool?

A We are producing approximately 320 barrels of oil per day from the 1 D.

Q Is that a top allowable well?

A No, sir, top allowable is 340. We are almost top allowable, not quite.

(Whereupon, Exhibits 5A through 20A marked for identification.)

Q (By Mr. Morris) Referring to Exhibit 5A, will you state what that is and what it shows, please?

A This is a graphical illustration of our monthly oil production versus time for the Nonombre Upper Penn Pool. It shows the production beginning in May of '65, when our first well was completed. Our second one was completed shortly thereafter in July. We reached a maximum production of some 14,000 barrels a month. We have declined slightly from this amount due to declining production in the State C Number 1.

This C Number 1 was placed on artificial lift in March, however, this does not show up until the month of May due to a trucking situation we had. We were trucking our oil in May without a pipeline connection and back up to approximately 14,000 barrels again in May.

Q Does that trucking situation account for the sharp dip during the month of April, '66?

A Yes, it does.

Q And then the artificial lift installation accounts for the subsequent rise in May of the year?

A That is correct.

Q Do you have similar information with respect to the Lower Pennsylvanian?

A Yes, sir. Exhibit 6A is a plot of the monthly oil production for the Nonombre Lower Penn. Our first month's production in this pool was some 4500 barrels of the C Number 1. The well immediately began producing, I say immediately, in about three weeks began producing approximately 60 per cent water. It did not make any oil for four months. Since that time we have been making approximately 300 barrels per month, with an intermitter on the well.

In December our second well in the pool was completed, this was the State D Number 2. Most of the production you see from December of '65 on through June of '66 is due to the State D Number 2. We also see the same drop in production in April on the Nonombre Lower Penn, which is due to our trucking situation.

Q Are any of the wells in either the Upper or Lower Pennsylvanian presently producing at top allowable?

A The State D Number 2 is now producing at top allowable. We got it -- We had artificial lift installed there the first of this month. It is producing top allowable.

Q And you mentioned at the beginning of your testimony that your D 1 is near top allowable in the Upper Penn?

A That's correct. We have artificial lift installed on our D 1 Upper, also on the C 1 Lower. However, we have not been able to produce this since the last week, since the

well made considerable amount of water. We did not have a place to put the water. We now have an injection well in the Upper Penn and we are starting to dispose of the water from this well in the Upper Penn. However, we do not have any tests on it as yet.

Q Refer next to your Exhibit 7A and state what it is and what it shows.

A This is a plot of the reservoir pressure versus cumulative production for the Nonombre Upper Penn Pool. The first point on this graph dated April, 1965 is from drill stem test. That was our initial pressure in the pool, which was 3868, I believe. We ran a pressure buildup test in May, which was a little lower than that. The September, 1965 pressure is a pressure taken from two pressure buildup tests, one on the State C Number 1, one on the State D Number 1.

In March of '66, we have a pressure that was run on the State C Number 1 which shows it to be just a little below saturation pressure at that time. This curve, I think, illustrates that we do have a solution gas drive reservoir. We had a very rapid decrease in pressure to the saturation point. We dropped from some 3870 pounds down to 2200 pounds while we were producing approximately 92,000 barrels of oil.

Since that time I think our pressure has started to level out. However, we don't have any history, really, past

that time. This does also, I think, illustrate we have a limited reservoir due to the very rapid decrease in production, I mean decrease in pressure, while we were obtaining 90,000 barrels of oil.

Q Do you have a pressure versus production curve with respect to the Lower Pennsylvanian?

A Yes, sir, that's shown on Exhibit 8A. This is a straight line, we have not had any pressure drop in the Nonombre Lower Penn Pool. The first pressure was from a pressure buildup test in May of '65, and the only other pressure on there is March of '66, which was actually recorded to be four pounds higher than our initial pressure.

Q What is the significance of this data?

A I think this illustrates that the pool is producing under a very strong water drive, from an unlimited water aquifer, apparently.

Q Treating Exhibits 9A, 10A, 11A and 12A as a set, Mr. Baker, what are those Exhibits and why are they presented here as Exhibits?

A These are plots of data obtained from pressure buildup tests run on the Nonombre Upper Penn Pool and the Lower Penn Pool. The first one is on the State C Number 1, in May of '65. The second one is on the State C Number 1 in August of '65. The third one is on the State D Number 1,

August of '65. The fourth one is the Nonombre Lower Penn Pool State C Number 1 in May of 65.

Information taken from these curves is used in the following Exhibits to calculate permeability from those two zones.

Q Referring to Exhibits 13A and 14A, would you state what permeability you have calculated for the Upper and Lower Pennsylvanian?

A 13A shows permeability calculations for three-- for two wells on three tests in the Upper Penn Pool. The first one is State C Number 1 with the calculated permeability of 13.3 millidarcies. The second one, State C Number 1 at a later date calculated a permeability of 4.3 millidarcies. The third one is the State D Number 1, from which we calculated permeability of 52 millidarcies.

This, I think, shows the permeability range of this reservoir. It appears that our D Number 1 is completed in a little better permeability than C Number 1. Permeability of this reservoir, I think we could say, would run from 10 to 50 millidarcies from what we have here.

The next Exhibit, 14A, shows permeability calculations made from a pressure buildup test on the State C Number 1 Lower zone, which indicates a permeability of some 440 millidarcies in the Lower Penn Pool.

Q Another indication of the difference between these two reservoirs and their characteristics?

A Yes. It certainly is.

Q Referring to Exhibits 15A and 16A, are these what you have called productive index calculations for both the Upper and Lower Pennsylvanian?

A Yes, sir, these are PI calculations that were made from the same data taken on these pressure buildup tests.

Q What are the conclusions shown from these Exhibits?

A In the Upper Penn Pool, this shows that the State D Number 1 is completed in a little better section, or is capable of producing a little better, anyway, than the State D Number 1. The State D. Number 1 is capable of producing better than the State C Number 1.

Q In the Upper?

A In the Upper, yes. The RPI range from 2.67, .155, .541.

Now, Exhibit 16A shows a PI calculation in the Lower Penn Pool. We have an indicated PI of 6.17 which is very high and I think for any reservoir. It illustrates the difference in these two reservoirs, I think.

Q Have you conducted any interference tests in either one of these reservoirs since the original Hearing in this case?

A Yes, sir. Exhibit 17A is a plot of an interference test conducted on the Upper Penn zone between our State C Number 1 and our State D Number 1. This test was run from 8-26-65 to 9-6-65. The two wells were shut in at the same time. They were allowed to remain shut in for a period of 190 hours, they built to the same pressure. At the end of 190 hours the State D Number 1 was opened on a 1/64 choke to produce at its allowable rate, which was then about 320 barrels a day. The C Number 1 continued to build for a period of 12 hours, after that time the pressure in the C Number 1 started to drop after the D Number 1 had been producing 74 hours, we had a pressure drawdown of 34 pounds recorded in our State C Number 1.

Q Now, how far apart are these two wells located from each other?

A These two wells are located 1867 feet apart; using this radius, converting it to acres, we have an indicated drainage area of some 250 acres shown from this test. That is in a period of a little over 12 hours, we had recorded a pressure drawdown over an area of some 250 acres, it appears.

Q From this test and based on the other data that you have presented in your engineering Exhibits, what conclusions have you reached concerning the area that can be drained and developed by one well in each of these two pools?



A Well, from this interference test we can definitely conclude that the Upper Penn zone will drain in excess of 160 acres, one well in the Upper Penn zone will drain in excess of 160 acres. From our permeability calculations, we showed that the Lower zone had a permeability of some ten times that of the Upper zone, and I think this would certainly lead us to believe that the Lower zone, a well in the Lower zone, would be capable of draining a larger area than a well in the Upper zone, due to much better permeability that we have in the Lower zone.

Q Have you made estimates of the reserves per acre in each, in the Lower and in the Upper Pennsylvanian Pools?

A Yes, I have. Exhibit 18A is volumetric reserve estimates for the Nonombre-Upper Penn Pool. We show our data there, a net pay of 12 feet, porosity of 7.3 per cent, water saturation of 24.2 per cent. These values were obtained from log analyses, formation volume factor, which was obtained from a fluid analysis we had run, and a recovery factor of 25 per cent, which is an estimate, and I think probably a little optimistic in the case of the Nonombre-Upper Penn Pool, but with these figures we calculate an oil in place of 816 barrels per acre for 130,600 barrels per 160 acres.

Q Have you made a similar estimate for the Lower Penn?

A Yes, sir. Exhibit 19A shows the same thing for the

Lower Zone, ultimate recovery here is figured to be 1,010 barrels per acre, or 161,600 barrels for 160 acres.

Q Using these estimates, Mr. Baker, have you made a study of the relative economics of different size spacing units in both the Upper and Lower Pennsylvanian?

A Yes, sir, I have. Exhibit 20A shows the economics connected with the two pools. At the top of this Exhibit, we show the Upper Penn with our crude price per barrel of \$3.01, our casing-head gas revenue, production tax royalty, lifting cost, to give us a net income per barrel of \$2.36.

Below this we show the different spacing units, 40 acres, 80, 160 acres, and the ultimate recovery we could expect under each of these size units.

Q Is there a correction you wish to make on the Exhibit with respect to the 160 acre profit situation?

A Yes, sir. On the line entitled Net Profit Under 160 Acres, we show \$136,700.00 in parentheses. This should not be in parentheses, this is a plus figure and not a minus figure.

Q But for 40 acre and 80 acres, the figures are correctly shown in parentheses as a net loss?

A That is correct. We would have a profit only under 160 acre spacing. This would have a ratio of income to investment of 1.80 to one.

For the Lower Penn our figures are practically the

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same, our crude price is slightly lower due to our lower gravity. We have a net income per barrel of \$2.30. We show here that for 40 acre spacing we would operate at a loss, 80 acre spacing would be break even proposition, and we would show a net profit under 160 acres.

Q Mr. Baker, you previously testified that you had reached the conclusion concerning the capability of one well in each of these pools to effectively drain 160 acres. Now, based upon your study of economics, have you reached any conclusions with respect to the spacing that is required in this pool from an economic standpoint?

A Yes, sir, I have. For a well to be profitable in either the Upper Penn or the Lower Penn, it would have to be drilled on 160 acre units. We could not realize a profit under either 40 acre or 80 acre spacing in either zone.

Q From these conclusions, do you have any recommendations to the Examiner concerning what action the Commission should take on the special rules and regulations -- the temporary special rules and regulations that are presently in effect in these two pools under the provisions of Order R-2929?

A Yes. I would recommend that these temporary rules be made permanent.

Q Are you aware, Mr. Baker, of any other Pennsylvanian Pools in this general area that are productive of oil that are

spaced on 160 acre spacing similar to the temporary rules that are presently in effect in this pool?

A Yes, sir. The East Saunders Pool which is located approximately three miles directly south of the Nonombre is based on 160 acre proration units. These are permanent rules. There is one other pool in the area, the High Plains-Penn, which is some six to seven miles to the southeast, is operating under 160 acre rules. However, I believe these are temporary at the present time.

Q Were Exhibits 5A through 20A prepared by you or under your supervision?

A Yes, sir, they were.

MR. MORRIS: We move the introduction of Exhibits 5A through 20A into evidence.

MR. UTZ: 5A through 20A will be entered into the record of this case.

(Whereupon, Exhibits 5A through 20A offered and admitted in evidence.)

CROSS EXAMINATION

BY MR. UTZ:

Q Does Midwest have any more intentions of drilling any more wells in this pool?

A We do not anticipate any further development in the Nonombre-Upper or Lower Penn.

Q That would simply mean that the pool is fully developed on three wells, is that right?

A Yes, I think the pool will be completely drained with the wells that have been drilled to the present time. I believe both pools will.

MR. UTZ: Any other questions of the witness?

CROSS EXAMINATION

BY MR. PORTER:

Q Are both of these pools water drive?

A No, sir, the lower pool is water drive, the upper is solution gas drive.

Q In this water drive pool, do you think that 160 acre allowable might be too high? Is the pool rate sensitive?

A No. I don't believe it's rate sensitive. From our PI tests I think you can see that the allowable is certainly not too high. We have a PI of 6.17 in the lower zone.

Referring back to this Exhibit, which was Exhibit 16A, on this particular test we produced the oil at a rate of 198 barrels of oil per day. At this rate, we had a pressure drawdown of only 32 pounds, so I certainly don't think --

Q You had an almost sudden influx of water?

A Yes, we did. The same thing has occurred in our D Number 2. It wasn't quite as sudden; however, it is producing approximately 60 per cent water at the present time, but we are

making top allowable out of this well.

Q You think that you would have had this influx of water at a lower production rate?

A Yes, sir, I believe we would. I think it is a fractured reservoir and there's nothing that we could have done to prevent the influx of water there.

Q Are all these wells, all three of them single completions?

A No. The State C Number 1 is a dual completion, the first well we drilled.

Q In figuring your economics, you have figured single completions in the well costs?

A In figuring the economics, I took the costs that we have spent to date on the State C Number 1, the State D Number 1, and the State D Number 2, the drilling costs, the completion costs, the installation of artificial lift on both zones in the C 1, the installation of artificial lift on the D 2, and I estimated \$20,000.00 for artificial lift on the D 1, I took this total figure and divided it by four, for our four completions, and got \$171,500.00 for a well.

I didn't try to differentiate between an Upper Penn and Lower Penn well. There was only three or four hundred feet difference in the depth of them.

MR. PORTER: That's all the questions I have.

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MR. UTZ: Are there any other questions?

MR. MORRIS: No other questions.

MR. UTZ: The witness may be excused. Any statements in the case?

MR. HATCH: I have a letter to read. "Sun Oil Company, July 18, 1966, in reference to Case Number 3259, to the Oil Conservation Commission. This letter regards Commission called Hearing to be held July 19, 1966 to review the provisions of Order R-2929 which established 160 acre spacing units for the Nonombre-Upper and Lower Penn Pools, Lea County, for a one year period. As an interest owner in the subject area, Sun Oil Company urges the Commission to permanently adopt 160 acre spacing units for the Nonombre-Upper and Lower Pennsylvanian Pools of Lea County, New Mexico. Sun Oil, by A. R. Balou."

MR. UTZ: Any other statements? The case will be taken under advisement.

We will take a ten minute recess.

(Whereupon, the Hearing was recessed for ten minutes.)

I N D E X

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NORBERT MCINTYRE	
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BILL BAKER	
Direct Examination by Mr. Morris	11
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Cross Examination by Mr. Porter	24

E X H I B I T S

EXHIBIT	MARKED FOR IDENTIFICATION	OFFERED	ADMITTED
No. 1A	3	9	9
No. 2A	5	9	9
No. 3A	8	9	9
No. 4A	8	9	9
Nos. 5A through 20A	13	23	23

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STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Notary Public 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.

Witness my Hand and Seal this 30th day of July, 1966.


NOTARY PUBLIC

My Commission Expires

June 19, 1967.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No 32-59, heard by me on July 19, 1966.


Examiner
New Mexico Oil Conservation Commission

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
May 26, 1965

EXAMINER HEARING

IN THE MATTER OF:

APPLICATION OF MIDWEST OIL CORPORATION FOR
A DUAL COMPLETION, LEA COUNTY, NEW MEXICO

No. 3258

APPLICATION OF MIDWEST OIL CORPORATION FOR
THE CREATION OF TWO NEW OIL POOLS, AND FOR
SPECIAL POOL RULES, LEA COUNTY, NEW MEXICO

Case No. 3259

BEFORE:

DANIEL S. NUTTER

TRANSCRIPT OF HEARING

DEARNLEY-MEIER REPORTING SERVICE, Inc.

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[illegible]

DEPARTMENT OF JUSTICE)
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PAGE

STATE OF NEW MEXICO

COUNTY OF SANTIAGO

IN and to the Court

DO hereby certify

that the foregoing

Alfred K. Hale

I do hereby certify that the foregoing is
a complete record of the proceedings in
the Examiner hearing of Case No. 3258-3259
heard by me on 5/26, 1965.

[Signature], Examiner
New Mexico Oil Conservation Commission

State of New Mexico
Oil Conservation Commission



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

July 27, 1966

Re: Case No. 3259
Order No. R-2929-A
Applicant:

MIDWEST OIL CORPORATION

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

A. L. Porter, Jr.
A. L. PORTER, Jr.
Secretary-Director

Carbon copy of order also sent to:

OTHER

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. 3259
Order No. R-2929-A

APPLICATION OF MIDWEST OIL CORPORATION
FOR THE CREATION OF TWO NEW OIL POOLS,
AND FOR SPECIAL POOL RULES, LEA COUNTY,
NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on July 19, 1966,
at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 27th day of July, 1966, the Commission, a
quorum being present, having considered the testimony, the record,
and the recommendations of the Examiner, and being fully advised
in the premises,

FINDS:

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

(2) That by Order No. R-2929, dated June 15, 1965, temporary
Special Rules and Regulations were promulgated for the Nonombre-
Upper Pennsylvanian Pool and the Nonombre-Lower Pennsylvanian
Pool, Lea County, New Mexico.

(3) That pursuant to the provisions of Order No. R-2929,
this case was reopened to allow the operators in the subject pools
to appear and show cause why the Nonombre-Upper Pennsylvanian Pool
and the Nonombre-Lower Pennsylvanian Pool should not be developed
on 40-acre or 80-acre spacing units.

(4) That the evidence establishes that one well in the
Nonombre-Upper Pennsylvanian Pool can efficiently and economi-
cally drain and develop 160 acres.

(5) That the evidence establishes that one well in the Nonombre-Lower Pennsylvanian Pool can efficiently and economically drain and develop 160 acres.

(6) That the Special Rules and Regulations promulgated by Order No. R-2929 have afforded and will afford to the owner of each property in the pools the opportunity to produce his just and equitable share of the oil in the pools.

(7) That in order to prevent the economic loss caused by the drilling of unnecessary wells, to avoid the augmentation of risk arising from the drilling of an excessive number of wells, to prevent reduced recovery which might result from the drilling of too few wells, and to otherwise prevent waste and protect correlative rights, the Special Rules and Regulations promulgated by Order No. R-2929 should be continued in full force and effect until further order of the Commission.

IT IS THEREFORE ORDERED:

(1) That the Special Rules and Regulations governing the Nonombre-Upper Pennsylvanian Pool and the Nonombre-Lower Pennsylvanian Pool, promulgated by Order No. R-2929, are hereby continued in full force and effect 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.

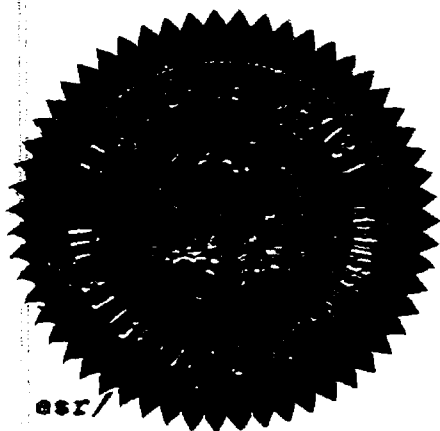
DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Jack M. Campbell
JACK M. CAMPBELL, Chairman

Guyton B. Hays
GUYTON B. HAYS, Member

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



esr/

Cong 3259

Record 7-19-66

Rec. Q-25-66

1. Grant Midwest a perminable order
for R-2929. for the Upper & Lower Penn.
Honombe oil pools. 160 Ac. Spacing.
Thurston Co.



TOM F. HILL
Manager, Southwest Division
F. G. PRUTZMAN
Superintendent Operating Department

PRODUCTION DEPARTMENT **SUN OIL COMPANY** SOUTHLAND CENTER, P. O. BOX 2880, DALLAS, TEXAS 75221

July 18, 1966

RE: Case 3259

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

Gentlemen:

This letter regards Commission-called hearing to be held July 19, 1966, to review the provisions of Order No. R-2929 which established 160-acre spacing units for the Nonombre Upper and Lower Pennsylvanian Pools, Lea County, for a one-year period.

As an interest owner in the subject area Sun Oil Company urges the Commission to permanently adopt 160-acre spacing units for the Nonombre Upper and Lower Pennsylvanian Pools of Lea County, New Mexico.

Yours very truly,

SUN OIL COMPANY

A. R. Ballou

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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
June 9, 1965

EXAMINER HEARING

IN THE MATTER OF: Application of Midwest Oil)
Corporation for a dual completion, Lea County,)
New Mexico. Applicant, in the above-styled)
cause, seeks approval of the dual completion)
(conventional) of its State "C" Well No. 1)
located in Unit K of Section 32, Township 13)
South, Range 34 East, Lea County, New Mexico,)
to produce oil from the Upper and Lower)
Pennsylvanian formations through parallel)
strings of tubing; and application of Midwest)
Oil Corporation for the creation of two new)
oil pools, and for special rules, Lea County,)
New Mexico, including a provision for 160-acre)
proration units, and fixed well locations...)

Case No. 3258

&
3259

BEFORE: ELVIS A. UTZ, Examiner

TRANSCRIPT OF HEARING

MR. UT2: Case 3258 and Case 3259. Application of Midwest Oil Corporation for a dual completion, Lea County, New Mexico; and application of Midwest Oil Corporation for the creation of two new oil pools, and for special pool rules, Lea County, New Mexico.

MR. MORRIS: If the Examiner please, I'm Richard Morris of Seth, Montgomery, Federici and Andrews, Santa Fe, appearing on behalf of the Applicant, Midwest Oil Corporation. We will have two witnesses, Mr. Norbert McIntyre and Mr. Bill Baker.

(Witnesses sworn.)

MR. MORRIS: At the outset, Mr. Examiner, may I state that Midwest Oil Corporation is seeking the creation of two new oil pools for Pennsylvanian production, on the basis of its dually completed State "C" Well Number 1 located in Unit K of Section 32, Township 13 South, Range 34 East, Lea County, New Mexico. We're also seeking the establishment of special pool rules in each of these two pools, including a provision for 160-acre proration units.

Now, in our original application we asked for a provision for fixed well locations. Our testimony here today will show that we are amending our request in this regard to permit flexible well locations rather than fixed well locations, with a well to be located within 150 feet from the center of any

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quarter-quarter section. With that preliminary I'll call my first witness.

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

DIRECT EXAMINATION

BY MR. MORRIS:

Q What is your name, please?

A Norbert McIntyre.

Q By whom are you employed and in what capacity, and where are you located?

A Employed by Midwest Oil Corporation as a geologist in Midland.

Q Have you previously testified before the Commission, or one of its examiners?

A Yes, sir, I have.

Q Referring to the brochure that has been marked as an exhibit in this case, Mr. McIntyre, would you turn to Page 1 of that brochure and state what it is and what it shows?

A This Page 1 is simply a land plat showing in the green Midwest acreage; the red arrow indicating Midwest Number 1 State "C" discovery well and the proposed Midwest Oil Pennsylvanian Pool. It also shows geographically actually the position of the well in relation to the South Saunders Pool some two and a half miles to the south.

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Q Is that the South Saunders or East Saunders?

A East Saunders, I beg your pardon. It is also located approximately three miles east southeast of the Lazy J Pool which produces from the Pennsylvanian much higher in the section, and is separated by a dry hole further to the west, off of this map.

The only other production which would be associated with this would be seven miles to the northeast in the Ranger Lake Pool, which produces from a zone comparable to our lower zone in this well. Then, of course, you have the High Plains Unit which also produces from our upper zone approximately four miles to the southeast. It might be pointed out that in the case of a High Plains and the East Saunders, these fields are being developed on 160s.

MR. MORRIS: In that regard, Mr. Examiner, I would ask the Commission and the Examiner to take administrative notice of the order establishing special rules and regulations including provisions for 160-acre oil proration units in the East Saunders Permo Pennsylvanian Pool, and the High Plains Pennsylvanian Pool which are Orders R-2359-B establishing permanent rules in the East Saunders and Order R-2874 establishing rules in the High Plains Pennsylvanian.

Q (By Mr. Morris) Mr. McIntyre, coming back to Page 1 of this exhibit, is this area of the discovery well predominately

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State acreage?

A Yes, it is.

Q Are there other wells, other than the discovery well that have been completed in this pool so far?

A No, they have not. At the present there are two wells being drilled in the area, namely the Midwest 1 State "D", which is in the southwest northeast of the same section, and the Cactus Number 1 State Number 1 U. S. Smelting State, which is located in the southeast southeast of Section 30 to the northwest.

There are also -- There has been a well staked by Sun Oil Company that will be in the northeast southeast of Section 31, one-half mile west of the discovery well.

Q I see no geological structure depicted on this plat, Mr. McIntyre. Do you have any such structure map to show to the Commission at this time?

A I do not. Actually a structure map would only be related to the one well; the well control or density in this area is not sufficient that a structure map would likely show very much.

Q Do you have a log section of the well that would show the intervals in which you are completed, and other information on your State "C" Number 1?

A Yes. The second page is a log section showing the drillstem test and completion information on our 1-C State "A"

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gamma ray neutron log.

Q What are the intervals in which each of these two sources of production are perforated?

A Our upper zone in this well is between 10,344 and 10,360, and the lower zone was perforated from 10,694 to 10,719.

Q Is there evidence available to you from which you have concluded that there is separation between these two zones?

A Yes. On our drill stem test information on the test conducted between 10,325 and 10,382, which takes in the producing zone we encountered the water table in the bottom of that zone, which would indicate the upper zone has reached the water table in this well.

Then farther down the log, aside from the numerous shale breaks and impermeable beds, we once again encountered oil and gas, water free, with different pressures, different gravities on drill stem, the Number 1 between 10,491 and 10,509. That interval would appear to indicate the possible production there.

Then the lower zone having tested water free from a dolomite section, the lithology is completely different from the upper section, we also have a difference in lithology from the upper zone.

Q There are also different reservoir characteristics between the two zones?

A Yes, there are, and later in the testimony by Mr. Baker

he should point out the differences between the reservoirs.

Q This Page 2 of the exhibit shows the drillstem test information and the perforated intervals, is that correct?

A That's correct.

MR. MORRIS: If the Examiner please, that's all that I will have of this witness. We will ask Mr. Baker to testify on the engineering consideration of the case.

CROSS EXAMINATION

BY MR. UTZ:

Q Does this log show your completion intervals?

A Yes, sir.

Q In this well?

A In the depth column the perforations are shown on the left-hand side, and then on the right-hand side of the column the completion information as pertains to treatment and the initial potential from each zone.

Q These are both in the Pennsylvanian, right?

A Yes.

Q And you show three completion areas here?

A No, we show two. There is the interval between 10,491 and 10,509 which was drillstem tested but no attempt was made to complete from that interval.

Q That's the upper one?

A The upper one is from 10,344 to 10,360; that is our

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upper zone.

Q You completed in that zone?

A Yes, sir.

Q What about the one around 10,700?

A And we completed from perforations between 10,694 and 10,719, and that completion information is on the right-hand side.

Q That's your lower completion?

A Yes, sir.

Q What zone do you call that?

A That is the equivalent of the Ranger zone in the Ranger Field that, actually that's the only other place that we feel that produces from this zone, or from this interval.

MR. MORRIS: I might point out, Mr. Examiner, we have called these in our application, Upper Pennsylvanian and Lower Pennsylvanian. Whether the Commission will choose to follow that designation or call it something differently, we're not sure.

MR. UTZ: I'll have to see how they correlate with the areas around them.

Q (By Mr. Utz) What do you call the upper completion?

A It would be the Bough Line, within the Bough interval, of which there are in different areas three and four separate zones of porosity.

Q The interval between 10,-- Well, your upper completion and your lower completion is about how many feet?

A It would be 340 feet, I believe.

Q And in your opinion there's no vertical communication between these two zones?

A No, sir, I don't believe there is. Actually we have different gravities, different reservoir properties.

Q That will be shown by your engineering witness?

A Yes, sir.

Q These lower perforations were squeezed then?

A At the bottom, yes, between 10,938 and 10,948, yes.

Q And they were non-productive?

A Non-productive; recovered water.

Q Do you intend to recommend a name for these pools?

A Yes, sir, we have recommended M. W. O. Pennsylvanian Upper and Lower Pennsylvanian to the Commission, but as of two days ago we hadn't received any communication on it, whether that was accepted or denied.

Q M. W. O.?

A M. W. O.

Q May I inquire as to what that means?

A Midwest Oil.

MR. MORRIS: If the Commission would like to name this one themselves I am sure we would have no objection.

MR. UTZ: I'm sure I have no personal preference.

Q (By Mr. Utz) And to date you have one completed well?

A That's correct.

Q What are your intentions for development?

A At the present we have budgeted money for two more wells in this area, and Ralph Lowe has staked a location; I'm not sure of the exact location, but it will be in the northeast quarter of Section 5, approximately a half a mile southeast of our discovery well. That location has been cleared, and I suppose by now, I have been out of town, but by now I am sure it's been reported. That would be a total of five wells in addition to the two that we, one we completed and one we are presently drilling.

Q And the engineering witness will give testimony as to whether this will drain 160 acres?

MR. MORRIS: Yes, sir.

A Yes, sir.

MR. UTZ: Any other questions of the witness? The witness may be excused.

(Witness excused.)

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

DIRECT EXAMINATION

BY MR. MORRIS:

Q Mr. Baker, would you please state your name and position?

A Bill Baker, petroleum engineer, employed by Midwest Oil Corporation.

Q Where are you located, Mr. Baker?

A In Midland, Texas.

Q Have you previously testified before the Commission or one of its Examiners?

A Yes, I have.

Q Referring to Page 3 of the brochure before the Examiner, state what that is and what it shows.

A This is a diagrammatic sketch of our dual completion installation. It indicates all the strings of casing with perforations shown as were previously pointed out on the log section. It shows two strings of tubing, their setting depths, Baker Model D Packer separating the two zones.

Q Is this, for all purposes, a standard type conventional dual completion?

A Yes, this is. This is standard and has been accepted by the Commission in the past.

Q Turning to Page 4 of the brochure, what does that show?

A This is the general well data sheet. It shows the location, completion date and total depth of the well, and a



comparison of the completion of the two zones. It shows the perforated interval, the treatment and the initial potential which is in barrels per day not shown there. The upper zone produced 340 barrels per day, while the lower produced 504. The gas-oil ratios were different, the chokes were the same, the tubing pressures were different. Something not shown here is a recent test. I might point out that the lower zone is at this time producing water.

MR. UTZ: How about the gravities, do you have that?

A That is shown on the following page.

Q Turn to the following page entitled "Reservoir Properties", and point out the features there, please.

A Again this has the two zones listed side by side for comparison purposes. The net pay, porosity and water saturation are shown and are log interpretations. The permeability shown is nine millidarcies for the upper zone and 430 for the lower zone, and this was arrived at from the pressure build-up calculations. Formation volume factors are shown, which are the results of reservoir fluid analysis.

Reservoir pressure is, 72-hour pressure build-up, 3,868 on the upper zone and 4,069 on the lower zone. The reservoir temperatures were measured slightly different. The gravity is shown as 43 for the upper zone, 38.9 for the lower. This is corrected gravity at 60.

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Saturation pressures and fluid viscosity are the results of fluid analysis and they show a considerable difference there in the two zones.

Q Turning to your next page entitled "Reservoir Estimates", what are your estimates in barrels per acre for each of the two zones?

A This is a volumetric estimate which is all we have to go on right now. For the upper zone we have estimated 59 barrels per acre foot; for the lower zone, 69 barrels per acre foot. Due to a difference in net pay, we have an estimate of 826 barrels per acre on the upper zone, as opposed to 1,587 barrels per acre on the lower zone.

Q Have you used those reserve estimates in making an analysis and an estimate of the economics of production of each of these two zones?

A Yes, I have. That is shown on the next page. It is shown for an upper zone completion, for a lower zone completion and for a dual completion. I will go through this one for the upper zone, the crude price per barrel is shown, which is \$3.01, less our transportation cost; our casing-head gas revenue is added to give a total income per barrel, the production taxes are deducted along with the royalty and a lifting cost of twenty-five cents a barrel, to give a net income of \$2.20 per barrel.

Q Let me stop you right there, Mr. Baker. You mentioned a minute ago that you had a water influx in one of your zones. Has that been taken into account in computing the lifting cost?

A No, it has not. That would be in the lower zone. It has not been taken into account. It would increase considerably the lifting cost per barrel estimate that I have here, due to the problem of lifting the water and disposing of it.

Q All right, go ahead.

A Shown are the spacing units of 40-acre, 80-acre, and 160-acre, with gross recovery, net income, well cost, net profit and ratio of profit to investment for each one. The 40-acre shows a loss of income, the 80-acre spacing indicates a loss of income, while the 160-acre spacing indicates a small ratio of profit to investment for the upper zone.

Looking on down the page to the lower zone under the spacing units, again we show a loss of income on 40-acre spacing, a small return on our money on 80-acre spacing, and on 160-acre spacing we show a 1.3 to 1 ratio of profit to investment.

Below that are shown figures for a dual completion which were put in because we do have a dual completion, but I think a dual certainly cannot be anticipated in future drilling in here, and I would think that the figures for either the lower or upper zone would apply rather than the ones I have here for dual completion.

Q Your dual completion is the most optimistic picture?

A Oh, yes, definitely. It does show again a loss on 40-acre spacing with a small return of your money on 80-acre spacing, and a much better return of money on 160-acre spacing.

Q From an economic standpoint, would you consider, looking at the dual completion, that only on 160-acre spacing would you expect to receive a fair return upon your investment?

A Yes, we would definitely not anticipate a good return on our money on 80-acre spacing, if any at all. I think this will have to be drilled on 160-acre spacing to provide a good return on your money, or a return at all, possibly.

Q In view of the information that you have on this one well, the engineering and geological information, limited though that is at the present time, and in view of the economic picture that you have presented, do you have an opinion concerning the size proration unit which can be efficiently and economically drained and developed by one well in each of these two pools?

A Yes, I do. I think it should be developed on 160-acre spacing in view of the economics, it would definitely be necessary to develop on 160 acres, and in regard to drainage at this time, since we only have one well, we are limited in the amount of information we have; however, I do think from what we have that either of these reservoirs will drain 160 acres, and this conclusion is due to a comparison of our

reservoir characteristics with the reservoir characteristics in the East Saunders Permo Penn, which is operating under 160-acre spacing and apparently draining much more than 160 acres.

Q The application in this case, Mr. Baker, proposes special rules and regulations for these two pools. Would you propose the usual provisions for special rules and regulations for 160-acre proration units?

A Yes, I'd recommend that the Commission adopt the usual form of the special rules and regulations, with a provision for 160-acre proration units, with wells to be located within 150 feet of the center of any quarter-quarter section, and with an allowable factor of 7.67.

Q This allowable factor is the same allowable factor as is in effect in the East Saunders Permo Penn and High Plains Penn?

A Yes, that is correct.

Q Under the well spacing or well location requirements that you have just stated, would any exceptions be needed for wells that are, that have been drilled, or are now drilling, or have been staked in this area?

A No, sir, there would be no exceptions necessary.

Q Do I understand that you would ask the Examiner at this time to deem the application that we have made for fixed

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well locations amended to conform to what you have just proposed?

A That is correct.

Q What is your proposal concerning the duration of these special rules?

A I would propose that these rules be temporary rules to be in effect for one year's time, which would give us, as well as other operators in the pool, an opportunity with the additional drilling, to gather data in regard to well drainage.

Q Would you contemplate conducting interference tests between your wells in this pool?

A Yes. Yes, sir, we will run interference tests when we are able to when we want wells in the pool.

Q Do you have reasonable assurance of being able to bring in additional information at the end of the one year period to show the effect of these interference tests?

A That is correct. We can bring in information that will show what these interference tests have resulted in, and also additional reservoir information which can be gathered in the next year's time.

Q Was this brochure containing the exhibits we've referred to here prepared at your direction or under your supervision?

A Yes, sir, it was.

MR. MORRIS: We offer the brochure containing seven pages into evidence as our Exhibit Number 1 in these two cases, Mr. Examiner.

MR. UTZ: Without objection Exhibit Number 1 will be admitted into the record.

(Whereupon, Applicant's Exhibit No. 1 was admitted in evidence.)

MR. MORRIS: That's all I have of Mr. Baker at this time.

CROSS EXAMINATION

BY MR. UTZ:

Q Mr. Baker, I note that on your diagram you call the upper completion the Wolfcamp. Is the Wolfcamp considered a part of the Pennsylvanian?

A That is an error, that should be labeled Pennsylvanian. I don't feel I am qualified to interpret between the Wolfcamp and the Penn.

Q You consider it Upper Penn or Wolfcamp?

MR. MCINTYRE: Yes, sir, Upper Penn.

Q You say your permeability figures were determined from calculations, is that correct?

A Yes, sir, from pressure build-up data.

Q Do you consider nine millidarcies very high for an oil zone?

A I don't consider it high; I consider it high enough to drain 160 acres. The permeability on the first two wells that Kern County completed in the East Saunders-Permo Penn was slightly above ten millidarcies. They are, very definitely, effectively draining 160 acres or more.

Q Kern County, Texas?

A Kern County Land Company who operates two wells in the East Saunders-Permo Penn Pool.

Q I note that your figures are no different than most other people that come in, that from 40 to 80 you double your reserves; from 80 to 160 you double again. Is that where you think that the drainage efficiency is just as great on 160 as on 40?

A I don't feel there is very little difference.

Q Even in a nine millidarcy reservoir?

A That is correct. I think time is more of a factor than the radius that you are draining. It will take longer, of course, to drain 160 acres with one well than it would with two.

Q Why do you feel that you will not be able to utilize dual completions in these two pools?

A I think you could utilize it if the pay zones were there, if two pay zones were there in each well; but from my experience and what I have seen in most of the Pennsylvanian

Pools it is unlikely that the rest of the wells would be dual completions in this pool. For one thing, as I pointed out, we are now making water in our lower zone of our discovery well; which the zone could be completely watered out in another location if it happened to be a little bit lower.

Q This lower zone is now having water problems?

A Yes, sir.

Q In the East Saunders and High Plains, is the spacing there what we commonly call rigid spacing or flexible spacing?

MR. MORRIS: I have those orders available. It's what you would call rigid spacing, reading from Rule 3 of the East Saunders-Permo Penn Pool Rules. Rule 3 is: "Each well completed or recompleted in said pool shall be located within 150 feet of the center of either the northeast quarter or the southwest quarter of the governmental quarter section on which the well is located". This conforms to our original application in this case, but due to the plans of other operators in the pool, primarily we have amended our application to provide for fixed well locations.

I would point out to the Examiner that while it's not in Southeast New Mexico, still up in the Tooto Dome Pennsylvanian Pool in the San Juan County, there's provision for 160-acre oil proration units with flexible location. The only requirement there being that all wells shall be located within

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I would point out to the Examiner that while it's not in Southeast New Mexico, still up in the Tooto Dome Pennsylvanian Pool in the San Juan County, there's provision for 160-acre oil proration units with flexible location. The only requirement there being that all wells shall be located within

150 feet of the center of a governmental quarter-quarter section. That is Order Number R-2758. So far as precedent is concerned there is precedent for fixed well locations as well as flexible locations.

MR. UTZ: How about the High Plains, is it flexible or not?

MR. MORRIS: No, sir, it's fixed.

MR. UTZ: Same location?

MR. MORRIS: Yes.

MR. UTZ: Northeast, southwest?

MR. MORRIS: Yes, sir.

Q (By Mr. Utz) In your opinion, would the so-called fixed locations space this pool in a little more orderly fashion so that the radius of drainage will be a little more uniform, and prevent so-called wagon-wheeling?

A Is that question directed to me, Mr. Examiner?

Q Yes, sir.

A I don't believe that the fixed well locations would change any of the present development plans. There is presently a well drilling which would not be on this pattern; it would have to be an exception to this.

MR. MORRIS: Where is that well?

A That is the Cactus well which is in the southeast of the southeast of Section 30. That would not fall into the

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fixed location requirements of either the northeast or southwest quarter quarter.

Q Your discovery well is on location?

A That is correct. The second well which we are now drilling is on the same pattern.

Q Is that the only well, the well now drilling, is that the only well that will be off pattern, the one that's drilling now?

A I do not know the exact location of the well that Ralph Lowe has staked in Section 5. That one possibly would be off pattern; it would be an exception to that also. Other than that the others that I'm familiar with would be on this pattern.

Q Do you have any contour control of this pool at all at this time; do you have any idea as to whether it is a structure stratigraphic trap?

MR. McIntyre: Yes, sir, we have. Of course, with one point you can put a, your reversal or your crestal portion of an anticlinal feature in four directions from that well, so for the Commission we did not prepare one. However, correlating down to the East Saunders Pool we find that the porosity development in our 1-C State is some 58 feet higher, structurally, than the top of the perforated porosity in the Kern Number 1 State Well two miles to the south. Since we got water on

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drill stem test and logs indicated high water saturations within that zone datum somewhat higher than their perforations, it would indicate that there is some vertical separation, or possibly stratigraphic. However, the vertical separation seems to be easier to explain it by. Actually our relationships are, we are only related to the well a mile and a half to the north and the well two and a half miles to the south, and you are hard put to make any sort of a sub-surface interpretation with that control.

Q There actually hasn't been any dry holes drilled between the East Saunders and your area, has there?

A No.

Q So it could be that they're the same pool, couldn't it?

A Well, sir, aside from having encountered water in our well at a datum somewhat higher than they encountered oil, that would be hard to explain unless there actually is separation between the two. Actually on the log section basis the producing zones are not comparable. You'll find more shale and more bedded type lime in our 1-C State Well, whereas you find a more massive type lime in the East Saunders Pool, although age-wise I'm sure they're comparable.

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

The witness may be excused.

(Witness excused.)

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MR. UTZ: Are there any statements in this case?

MR. HINKLE: Mr. Examiner, Clarence Hinkle, Hinkle, Bondurant and Cristy, Roswell, New Mexico, appearing on behalf of Sun. I would like to make a brief statement on behalf of Sun. Sun concurs in the application of Midwest in connection with Case 3258 and also with the application of Midwest in connection with Case Number 3259 as amended; that is to provide for flexible well locations. The Sun Oil Company has considerable acreage in the vicinity of the well which is to be dually completed in the discovery well. It is also the owner of a half interest in the well which has been mentioned which would have to be an exception if an order is entered on a fixed well location.

Sun is very much in favor of the flexible well locations and of the proposed rules that are to be adopted, and feels that the pool or area can be just as effectively and efficiently developed on flexible well locations as on fixed well locations, and that the ultimate oil recovery from the pool will not be affected.

MR. UTZ: Any other statements? The Commission has in its file a telegram from Ralph Lowe, which in effect supports the application; as well as one from C. W. Trainor is an advocate of so-called flexible spacing. The case will be taken under advisement. The hearing is adjourned.

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission Examiner at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF I have affixed my hand and notarial seal this 30th day of June, 1965.

Ada Dearnley
Notary Public - Court Reporter

My Commission expires

June 19, 1965

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3258959 heard by me on June 2, 1965.
Thurman D. Evans
New Mexico Oil Conservation Commission

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State of New Mexico
Oil Conservation Commission



June 15, 1965

Date 1-1-68

Hobbs OCC _____ x
 Artesia OCC _____
 Aztec OCC _____
 OTHER _____

Case 3259

Heard 6-8-65

Rec. 6-10-65

Homondation

1. Grant Midwest Oil Corp. special pool rules of their pool discovery in their State 'C' # 11 32-135-34 E.
2. Create 2 pools to be known as the Homondre - Upper Penn + Homondre - Lower Penn. oil Pools.
3. Write order for each pool.
4. Use Order R-2359 except for pool name.
5. Give 7.67 Dept factor for an
a) completion depth of:
Upper Penn 10,344-10330
Lower Penn 10,694-10719

Pool Limits.

SW 1/4 sec. 32-135-34 E

1 yr temporary

Thurston

C. W. TRAINER

PHONE EX 7-1518 OR EX 3-9716 717 NORTH TURNER ST.

P. O. BOX 1100

HOBBS, NEW MEXICO 88240

June 7, 1965

New Mexico Oil Conservation Commission
Mr. A. L. Porter - Secretary-Director
Box 2080
Santa Fe, New Mexico

Re: NMOCC Hearing, June 9, 1965,
Case No. 3259, Midwest Oil
Corporation.

Gentlemen:

I am an interested party in the subject case as I hold leases on acreage which could ultimately have three 160 acre proration units in this field. I concur in the recommendation which I understand Midwest will propose for temporary 160 acre spacing with the well to be located in any governmental quarter section not closer than 660' from the quarter section lines.

It should be pointed out that wells are now drilling or completed at locations in the NE/4, SW/4 and SE/4 of governmental quarter sections. Rather than provide for fixed locations, I recommend that the rule be flexible enough to make these standard locations instead of granting exceptions for any of them.

Yours very truly,

CW Trainer
C. W. Trainer

OKG/pw

DOCKET: EXAMINER HEARING- WEDNESDAY - JUNE 9, 1965

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

The following cases will be heard before Elvis A. Utz, Examiner, or Daniel S. Nutter, Alternate Examiner:

CASE 3251: (Continued from the May 26, 1965 Examiner Hearing)

Application of Continental Oil Company for a waterflood project, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in the Rattlesnake Dakota Pool, San Juan County, New Mexico, by the injection of water into the upper and middle zones of the Dakota formation, through three injection wells in Sections 12 and 13, Township 29 North, Range 19 West.

CASE 3260: Application of Delaware-Apache Corporation for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the West Lusk Deep Unit Area comprising 1920 acres, more or less, of State and Federal lands in Township 19 South, Range 31 East, Eddy County, New Mexico.

CASE 3261: Application of Delaware Apache Corporation for a pool extension and special rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the extension of the Jenkins-Cisco Pool to include the S/2 of Section 19 and the NW/4 of Section 30, Township 9 South, Range 35 East, Lea County, New Mexico, and the SE/4 of Section 24, and the NE/4 of Section 25, Township 9 South, Range 34 East. Applicant further seeks the promulgation of special rules for said pool including a provision for 80-acre proration units.

CASE 3262: Application of Monsanto Company for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Cueva Unit Area comprising 12,489 acres, more or less, of State, Federal and fee lands in Townships 22 and 23 South, Range 25 East, Eddy County, New Mexico.

CASE 3263: Application of Jake L. Hamon for the creation of a new gas pool and for special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new Morrow Gas Pool for his Hamon State E-8913 Well No. 1 located in Unit A of Section 20, Township 20 South, Range 36 East, Lea County, New Mexico, and the promulgation of special pool rules including a provision for 640-acre spacing.

CASE 3264: Application of Carl Engwall for an exception to Commission Order R-111-A, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an exception to the potash-oil area casing and cementing rules as set forth in Commission Order R-111-A. Applicant

proposes to drill and complete a well in Unit L of Section 14, Township 20 South, Range 33 East, Teas Pool, Lea County, New Mexico, with surface casing set at approximately 950 feet, cement circulated, and production casing set at approximately 3400 feet and cemented to approximately 2500 feet above the casing point. The well would be plugged and abandoned in accordance with the provisions of Order R-111-A.

CASE 3265: Application of Coastal States Gas Producing Company for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the San Andres formation through perforations from 4545 feet to 4590 feet in its Southern Minerals State Well No. 1-15 located in Unit L of Section 15, Township 9 South, Range 33 East, Flying "M" San Andres Pool, Lea County, New Mexico.

CASE 3112: (Reopened)

In the matter of Case 3112 being reopened pursuant to the provisions of Order No. R-2824, which order authorized Gallup-Dakota commingling in the wellbore by means of a dual-flow downhole choke assembly in its Jicarilla 28 Well No. 1 located in Unit J of Section 28, Township 25 North, Range 4 West, Rio Arriba County, New Mexico. All interested parties may appear and show cause why the authority granted under this order should not be terminated.

CASE 3266: Application of Pan American Petroleum Corporation for a dual completion and commingling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the dual completion (conventional) of its Federal "A" Well No. 4 located in Unit L of Section 13, Township 9 South, Range 35 East, Lea County, New Mexico, to produce oil from the Bough Permo-Penn and an undesignated Devonian pool through parallel strings of tubing. Applicant further seeks authority to commingle the production from said pools on said lease after separately metering the production from each pool.

CASE 3258: (Continued from the May 26th examiner hearing)

Application of Midwest Oil Corporation for a dual completion, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the dual completion (conventional) of its State "C" Well No. 1 located in Unit K of Section 32, Township 13 South, Range 34 East, Lea County, New Mexico, to produce oil from the Upper and Lower Pennsylvanian formations through parallel strings of tubing.

Docket No. 16-65

CASE 3259: (Continued and readvertised from the May 26th examiner hearing)

Application of Midwest Oil Corporation for the creation of two new oil pools, and for special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the creation of two new oil pools for Pennsylvanian production for its dually completed State "C" Well No. 1 located in Unit K of Section 32, Township 13 South, Range 34 East, Lea County, New Mexico, and for the establishment of special pool rules, including a provision for 160-acre proration units, and fixed well locations.

CASE 3267: Application of Ted Collins, Jr., for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Zia Unit Area comprising 1440 acres of State land in Township 13 South, Range 32 East, Lea County, New Mexico.

J. O. SETH (1883-1963)

A. K. MONTGOMERY
WM. FEDERICI
FRANK ANDREWS
FRED C. HANNAHS
RICHARD S. MORRIS
JOHN G. JASPER
SUMNER G. BUELL

SETH, MONTGOMERY, FEDERICI & ANDREWS

ATTORNEYS AND COUNSELORS AT LAW
350 EAST PALACE AVENUE
SANTA FE, NEW MEXICO 87501

May 20, 1965

POST OFFICE BOX 2307
AREA CODE 505
TELEPHONE 982-3876

New Mexico Oil Conservation Commission
State Land Office Building
Santa Fe, New Mexico

Re: Cases Nos. 3258 and 3259

Gentlemen:

The application of Midwest Oil Corporation for the creation of two new Pennsylvanian oil pools for its dually completed state "C" Well No. 1, unit K, Sec. 32, T. 13 S., R. 34 E., Lea County, New Mexico, has been set for hearing on May 26, 1965 as Case No. 3259. In the original application filed for Midwest Oil Corporation special pool rules were requested including a provision for 80-acre proration units and well location requirements specifying the location of the initial well on any 80-acre proration unit to be within 150 feet of the center of either quarter quarter section.

Midwest Oil Corporation wishes to amend its application for special rules and regulations for each of the pools to include provisions for 160-acre proration units and well location requirements specifying that the initial well on any 160-acre proration unit shall be located within 150 feet of the center of either the NE $\frac{1}{4}$ or the SW $\frac{1}{4}$ of the quarter section.

We suggest that Case 3259 be dismissed and that a new case be advertised upon this amendment to the original application. We also request a continuance of Case 3258 involving the dual completion of the subject well to the same date as the hearing on the amended application which we understand will be early in June, 1965.

Very truly yours,

Richard S. Morris

RSM:LHS

cc: Mr. Bill Baker
Midwest Oil Corporation
1500 Wilco Building
Midland, Texas

DOCKET MAILED

Date 5/27/65

J. O. SETH (823-1963)

A. K. MONTGOMERY
WM. FEDERICI
FRANK ANDREWS
FRED C. HANNAHS
RICHARD S. MORRIS
JOHN G. JASPER
SUMNER G. BUELL

SETH, MONTGOMERY, FEDERICI & ANDREWS

ATTORNEYS AND COUNSELORS AT LAW

350 EAST PALACE AVENUE

SANTA FE, NEW MEXICO 87501

May 14, 1965

POST OFFICE BOX 2307

AREA CODE 505

TELEPHONE 982-3876

New Mexico Oil Conservation Commission
State Land Office Building
Santa Fe, New Mexico

Re: OCC Cases 3258 and 3259; May 26, 1965 Examiner
Hearing

Gentlemen:

Supplemental to the applications referred to above, please find enclosed Application For Dual Completion of the subject well on the Commission's standard form, three copies of a diagrammatic sketch of the dual completion of the subject well, and three copies of a plat showing leasehold interest in the area of the subject well, and the sonic and gamma ray log on the subject well.

Very truly yours,

Richard S. Morris

RSM:mf
Encls.

cc: Mr. B.D. Baker, Engineer
Midwest Oil Corporation
1500 Wilco Building
Midland, Texas

BEFORE THE OIL CONSERVATION COMMISSION OF NEW MEXICO

APPLICATION OF MIDWEST OIL
CORPORATION FOR THE CREATION
OF TWO NEW OIL POOLS AND FOR
SPECIAL RULES AND REGULATIONS,
LEA COUNTY, NEW MEXICO.

Case No. 3258

A P P L I C A T I O N

Comes now Midwest Oil Corporation, by its attorneys, and applies to the New Mexico Oil Conservation Commission for the creation of two new oil pools and for special rules and regulations therein and in support of its application states:

1. Midwest Oil Corporation has drilled its state "C" well No. 1 located in the center of the NE $\frac{1}{4}$ SW $\frac{1}{4}$ of Section 32, T. 13 S., R. 34 E., Lea County, New Mexico, and has completed said well in the Upper Pennsylvanian formation in the interval 10,344-10,360 feet and in the Lower Pennsylvanian formation in the interval 10,694-10,719 feet.

2. Midwest Oil Corporation seeks the creation of two new oil pools to be designated as Upper Pennsylvanian and Lower Pennsylvanian pools in the area of this well and also seeks the establishment of special rules and regulations for each of said pools to include provisions for 80-acre proration units and well location requirements specifying that the initial well on any 80-acre proration unit shall be located within 150 feet of the center of either quarter quarter section of the unit.

3. On the basis of the limited information available at this time it appears that one well in each of the proposed pools is capable of efficiently and economically draining and developing an area of at least 80 acres.

4. Approval of the subject application will prevent waste and protect correlative rights.

DOCKET MAILED

Date 5/12/58

WHEREFORE, Midwest Oil Corporation requests that this application be set for hearing before the Commission or one of its examiners and that the Commission enter its order creating the pools and establishing special rules and regulations therein, all as set forth in this application.

SETH, MONTGOMERY, FEDERICI & ANDREWS

By Richard S. Morris
P. O. Box 2307
Santa Fe, New Mexico
Attorneys for Midwest Oil
Corporation.

K&E 5 YEARS BY MONTHS 359-195
X 3 CYCLES
KEUFFEL & ESSER CO
MADE IN U.S.A.

MONTHLY OIL PRODUCTION

(bbl.)

10,000

1,000

1965	1966	1967	1968	1969
Jan.	Jan.	Jan.	Jan.	Jan.
Feb.	Feb.	Feb.	Feb.	Feb.
Mar.	Mar.	Mar.	Mar.	Mar.
Apr.	Apr.	Apr.	Apr.	Apr.
May	May	May	May	May
June	June	June	June	June
July	July	July	July	July
Aug.	Aug.	Aug.	Aug.	Aug.
Sept.	Sept.	Sept.	Sept.	Sept.
Oct.	Oct.	Oct.	Oct.	Oct.
Nov.	Nov.	Nov.	Nov.	Nov.
Dec.	Dec.	Dec.	Dec.	Dec.

NONOMBRE UPPER PENN. POOL
MIDWEST OIL CORPORATION

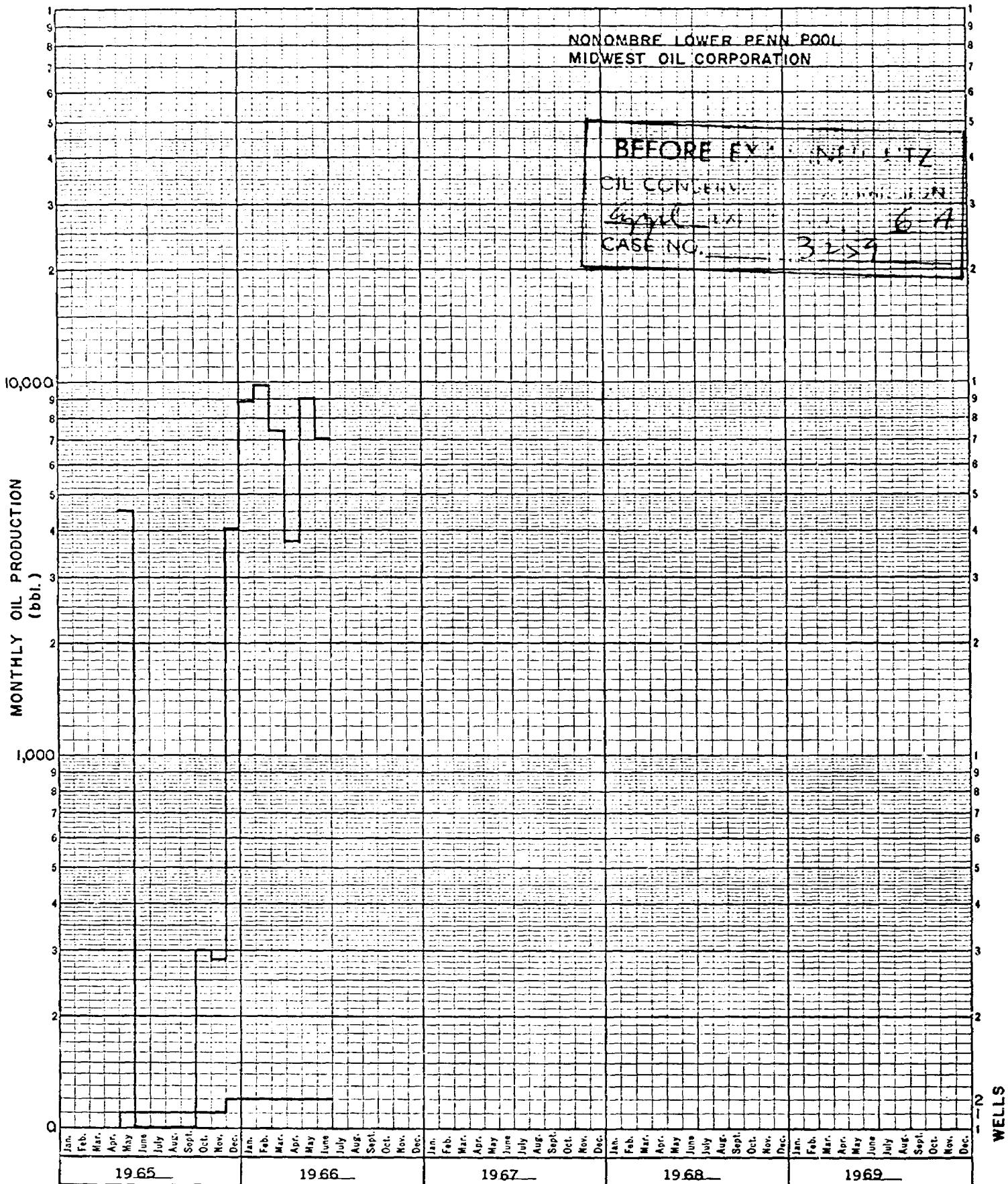
BEFORE EXAMINER UTZ

OIL CONSERVATION

EXP. NO. 5-A
CASE NO. 3252

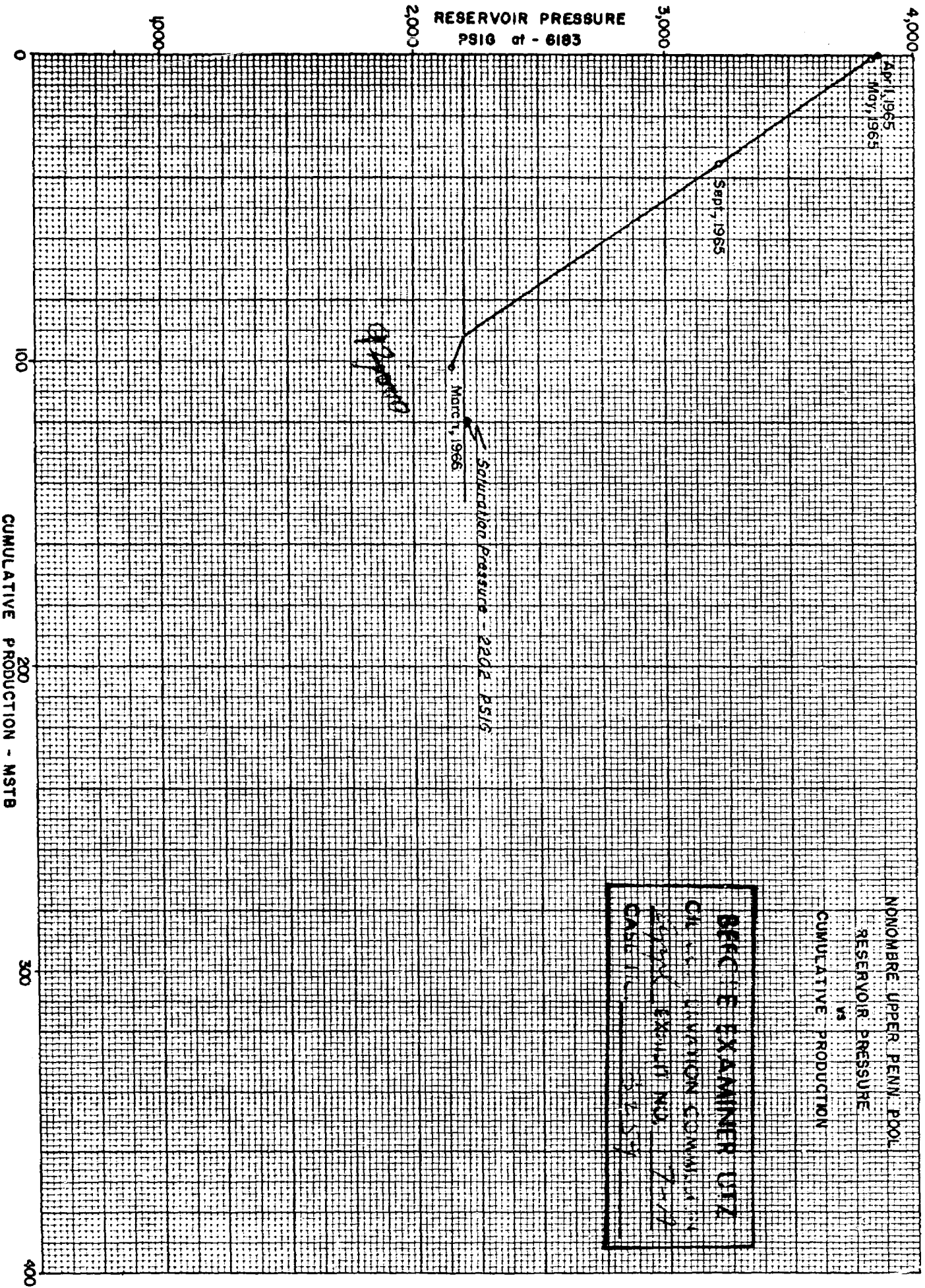
WELLS

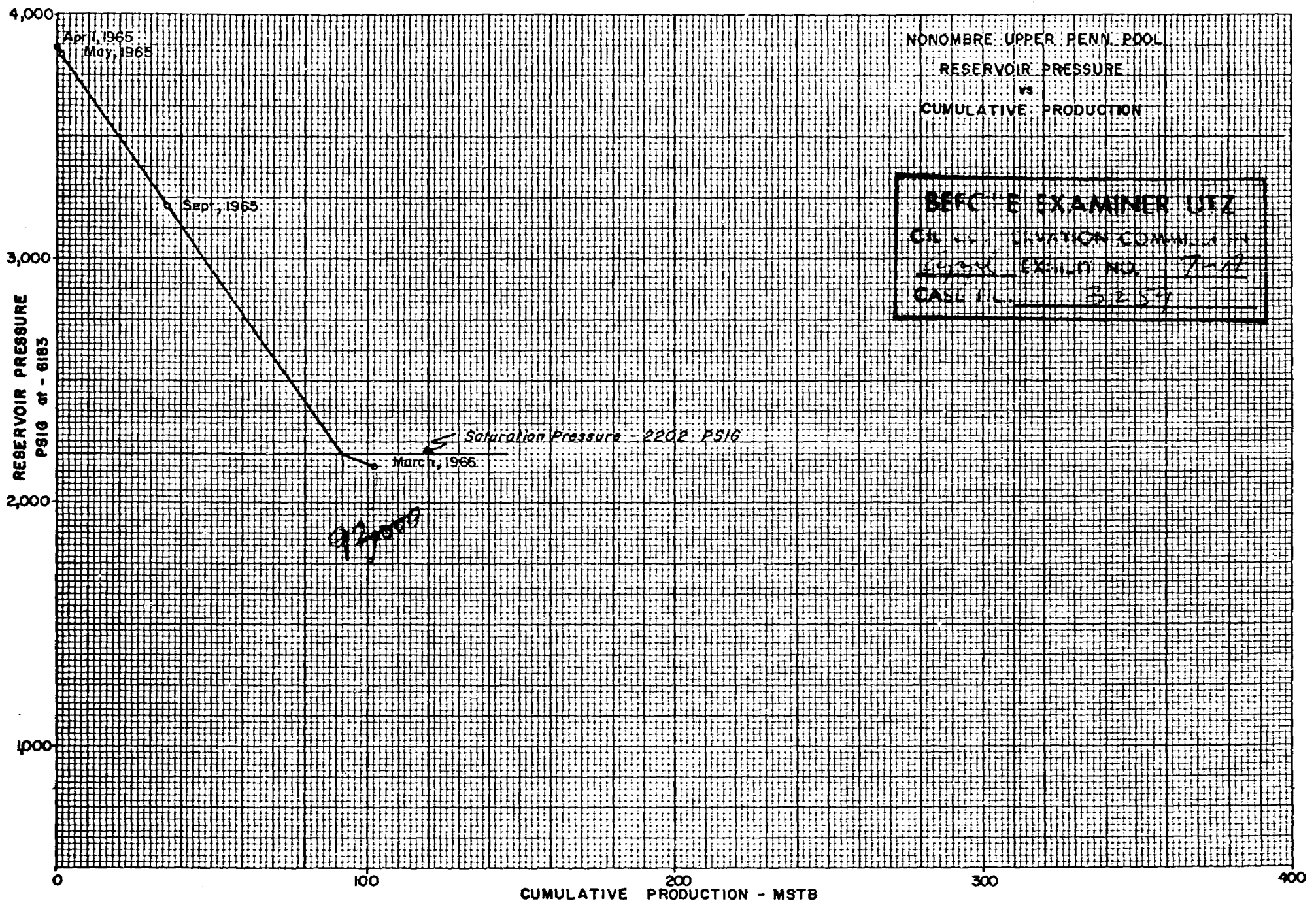
K&E 5 YEARS BY MONTHS 359-195
 X 3 CYCLES
 KEUFFEL & ESSER CO. MADE IN U.S.A.



NO. 340R-20 DIETZEN GRAPH PAPER
20 X 20 PER INCH

EUGENE DIETZEN CO.
MADE IN U. S. A.





NO. 340R-20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH

EUGENE DIETZGEN CO.
MADE IN U. S. A.

Nonombre Lower Penn Pool
Reservoir Pressure
vs
Cumulative Production

BEFORE EXAMINATION

CUMULATIVE PRODUCTION

Exhibit No. 8-A
CASE NO. 3254

May, 1965 March, 1966

RESERVOIR PRESSURE - PSIG AT -3514'

SATURATION PRESSURE - 1153 - PSIG

100

200

300

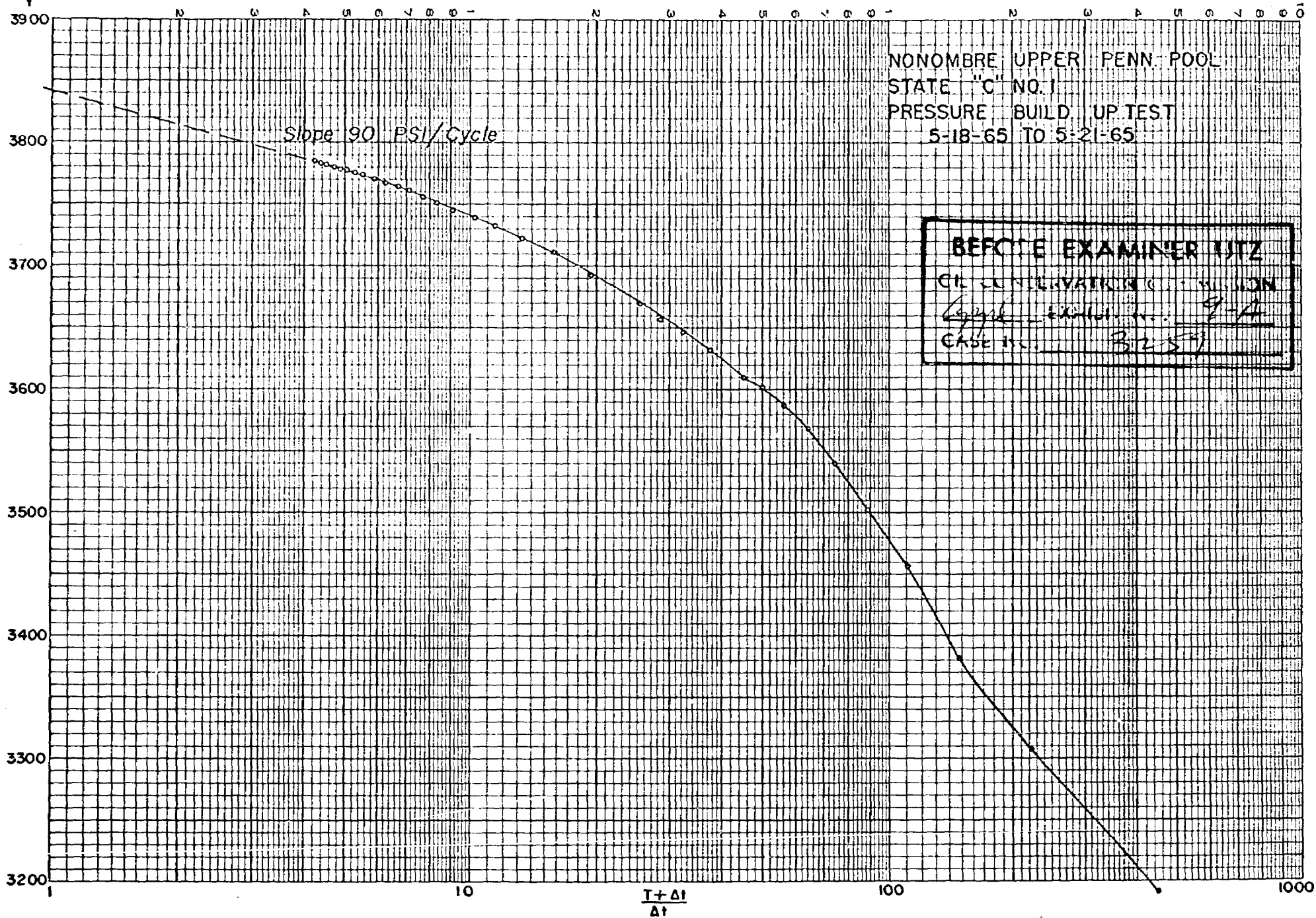
400

CUMULATIVE PRODUCTION - MSTB

NO. 340R-L310 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
3 CYCLES X 10 DIVISIONS PER INCH

EUGENE DIETZGEN CO.
MADE IN U. S. A.

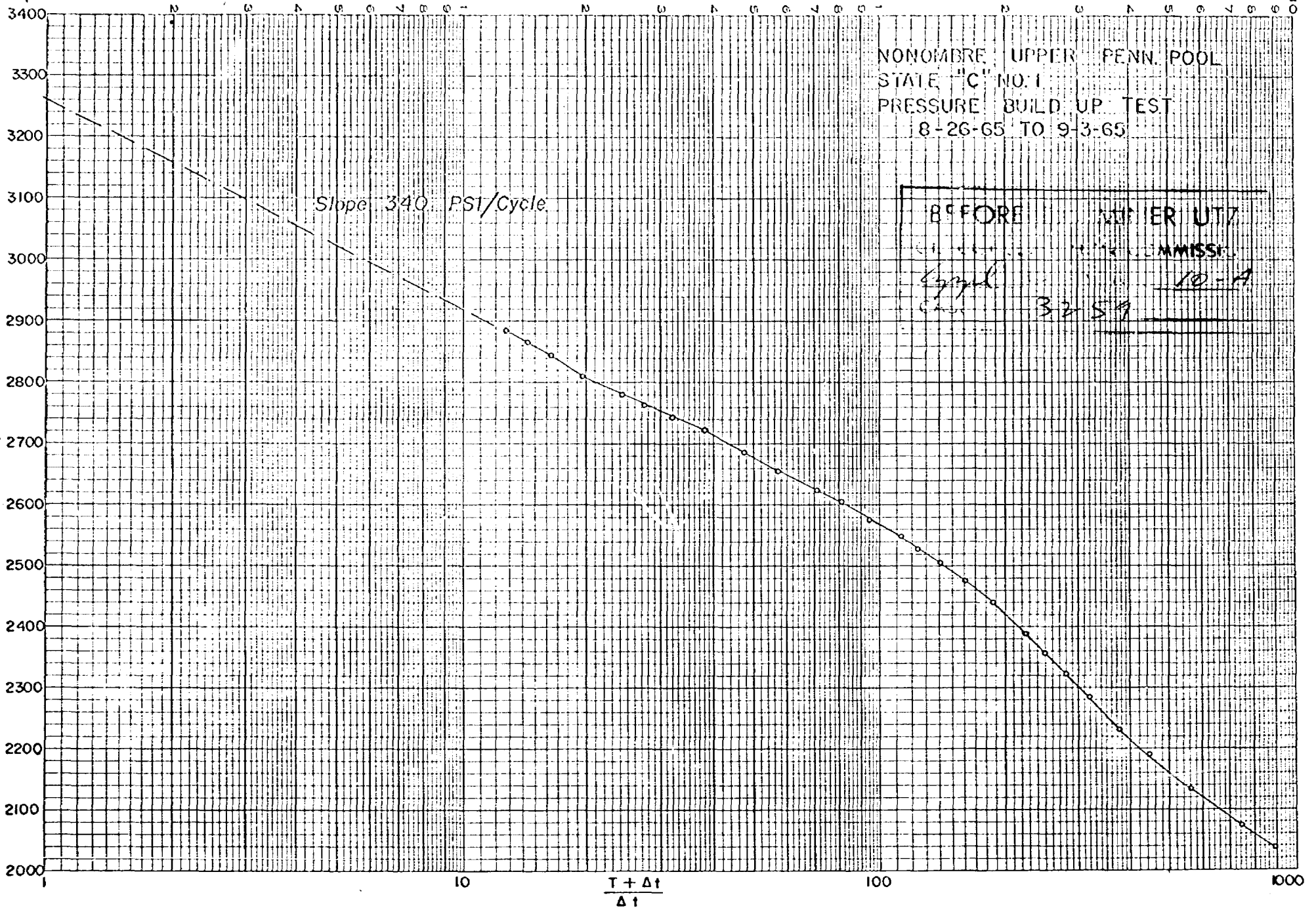
RESERVOIR PRESSURE
PSIG AT - 6183



NO. 3400-1310 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
3 CYCLES X 10 DIVISIONS PER INCH

EUGENE DIETZGEN CO.
MADE IN U. S. A.

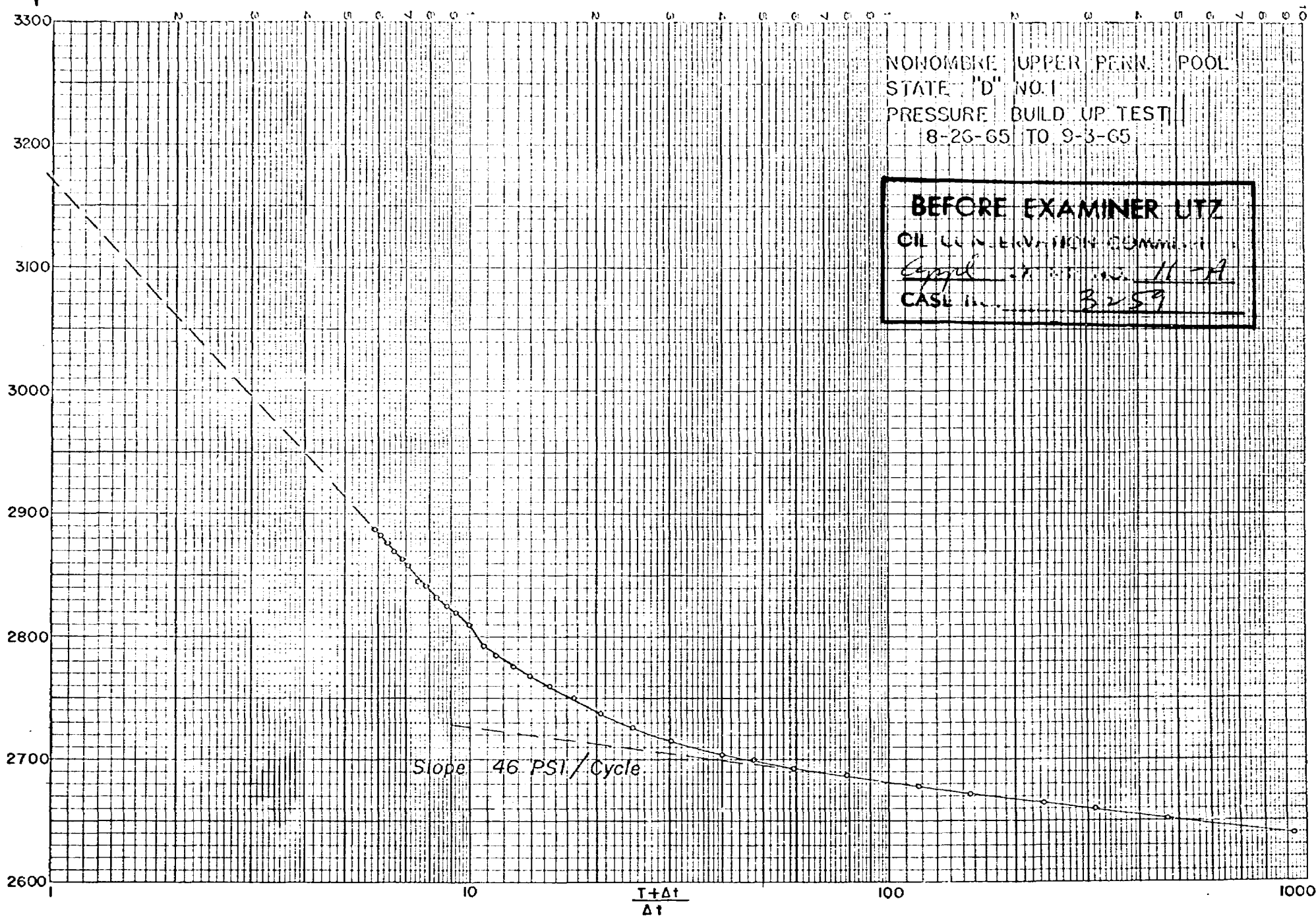
RESERVOIR PRESSURE
PSIG AT-6183



NO. 3402-10411 DIETZEN GRAPH PAPER
SEMI-LOGARITHMIC
3 CYCLES X 10 DIVISIONS PER INCH

EUGENE DIETZEN CO.
MADE IN U. S. A.

RESERVOIR PRESSURE
PSIG AT -G183



NO. 340R-L310 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
3 CYCLES X 10 DIVISIONS PER INCH

EUGENE DIETZGEN CO.
MADE IN U. S. A.

RESERVOIR PRESSURE
PSIG AT -6514

NONOMERE LOWER PENN. POOL
STATE "C" NO. 1
PRESSURE BUILD-UP TEST
5-18-65 to 5-21-65

BEFORE EXAMINATION	
CLASSIFICATION	
EXAMINER	12-A
CASE NO.	3259

4075
4070
4065
4060
4055
4050

Slope 4 PSI/Cycle

100

$\frac{T + \Delta t}{\Delta t}$

1000

10000

PERMEABILITY CALCULATIONS

State "C" No. 1

Pressure Build Up Test

5-18-65 to 5-21-65

$$\begin{aligned} K &= \frac{162.6 \ q \ Bu}{h \ m} \\ q &= 210 \text{ BOPD} \\ B &= 1.557 \\ u &= 0.315 \text{ cp} \\ M &= 90 \text{ psi/cycle} \\ h &= 14 \text{ Feet} \\ K &= \frac{(162.6) (210) (1.557) (0.315)}{(14) (90)} \\ &= 13.3 \text{ Millidarcys} \end{aligned}$$

State "C" No. 1

Pressure Build Up Test

8-26-65 to 9-3-65

$$\begin{aligned} q &= 270 \text{ BOPD} \\ B &= 1.570 \\ u &= 0.30 \text{ cp} \\ M &= 340 \text{ psi/cycle} \\ h &= 14 \text{ Feet} \\ K &= \frac{(162.6) (270) (1.570) (0.30)}{(14) (340)} \\ &= 4.3 \text{ Millidarcys} \end{aligned}$$

State "D" No. 1

Pressure Build Up Test

8-26-65 to 9-3-65

$$\begin{aligned} q &= 312 \text{ BOPD} \\ B &= 1.570 \\ u &= 0.30 \text{ cp} \\ M &= 46 \text{ psi/cycle} \\ h &= 10 \text{ Feet} \\ K &= \frac{(162.6) (312) (1.570) (0.30)}{(10) (46)} \\ &= 52 \text{ Millidarcys} \end{aligned}$$

BEFORE EXAMINER UTZ

CIL CONSERVATION COMMISSION

Lyndell EXHIBIT NO. 13-A

CASE NO. 3259

PERMEABILITY CALCULATIONS

Nonombre Lower Penn Pool

State "C" No. 1

Pressure Build Up Test 5-18-65 to 5-21-65

q = 198 ROPD

B = 1.211

u = 1.037

M = 4 psi/cycle

h = 23 Feet

K = $\frac{(162.6) (198) (1.211) (1.037)}{(23) (4)}$

= 440 Millidarcys

BEFORE EXAMINED LITZ

CL.

L. J. Lutz

CASE NO.

3259

14-A

PRODUCTIVITY INDEX CALCULATIONS

Nonombre Upper Penn Pool

State "C" No. 1

5-18-65

Oil Production = 210 BOPD
Static BHP = 3840
Flowing BHP = 3062 psi

P.I. = $\frac{210}{3840 - 3062}$
= 0.267

State "C" No. 1

8-26-65

Oil Production = 270 BOPD
Flowing BHP = 1534
Static BHP = 3260

P.I. = $\frac{270}{3260 - 1524}$
= 0.155

State "D" No. 1

8-26-65

Oil Production = 312 BOPD
Flowing BHP = 2596
Static BHP = 3170

P.I. = $\frac{312}{3170 - 2596}$
= 0.541

BEFORE EXAMINER UTZ	
OIL CONSERVATION COMMISSION	
<i>Cymel</i>	EXHIBIT NO. <u>15-A</u>
CASE NO.	<u>3259</u>

PRODUCTIVITY INDEX CALCULATIONS

Nonombre Lower Penn Pool

State "C" No. 1

5-18-65

Oil Production = 198 BOPD
Flowing BHP = 4036
Static BHP = 4068

P.I. = $\frac{198}{4068-4036}$

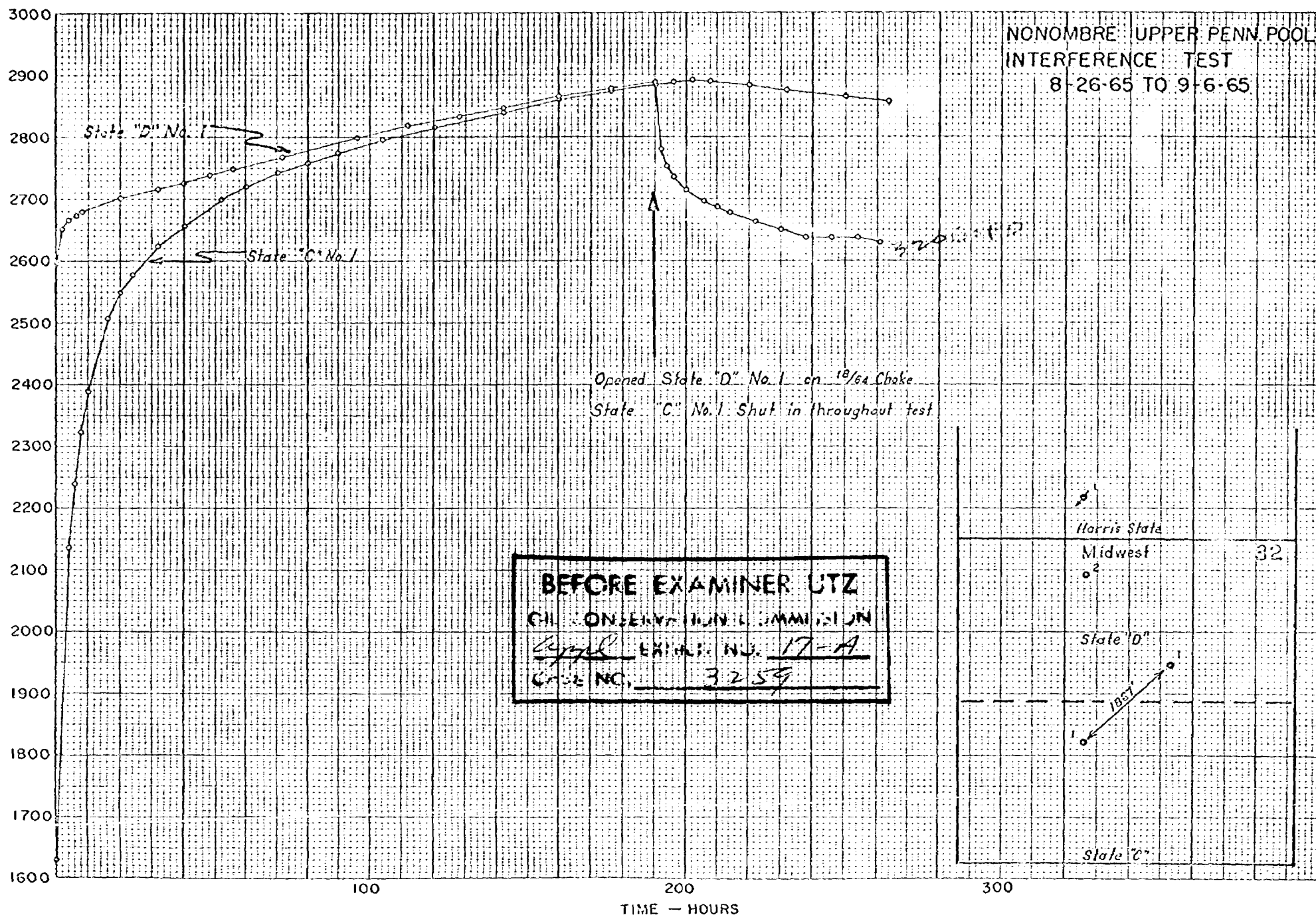
= 6.17

BEFORE EXAMINER	
CH. CL. EX. 16-A	
by <i>h. j. j.</i>	
C. 3259	

NO. 340R-20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH

EUGENE DIETZGEN CO.
MADE IN U. S. A.

RESERVOIR PRESSURE
PSIG AT -6183'



VOLUMETRIC RESERVE ESTIMATES

Nonombre Upper Penn Pool

Data

Net Pay	12 Feet
Porosity	7.3 Percent
Water Saturation	24.2 Percent
Formation Volume Factor	1.557
Recovery Factor	25 Percent

Calculations-

Oil In Place = $\frac{(7758) (0.073) (1-0.242)}{1.557}$
= 272 bbls per acre foot

Ultimate Recovery = $(272) (0.25)$
= 68 bbl per acre foot

Ultimate Recovery = $(68) (12)$
= 816 bbl per acre
= 130,600 bbl per 160 acre

BEFORE EXAMINER LITZ

OIL CONSERVATION COMMISSION

Lynd EX: 18-A

CASE NO. 3259

VOLUMETRIC RESERVE ESTIMATES

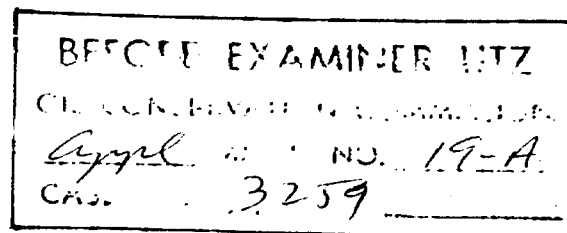
Nonombre Lower Penn Pool

Data

Net Pay	16 Feet
Porosity	5.5 Percent
Water Saturation	28.1 Percent
Formation Volume Factor	1.211
Recovery Factor	25 Percent

Calculations-

Oil In Place	=	$\frac{(7758) (0.055) (0.281)}{1.211}$
	=	253 bbls per acre foot
Ultimate Recovery	=	(253) (0.25)
	=	63 bbls per acre foot
Ultimate Recovery	=	(63) (16)
	=	1010 bbl per acre
	=	161,600 bbls per 160 acres



ECONOMICS

Nonombre Penn Pool

Upper Penn

Crude price per barrel	\$ 3.01
Casing head gas revenue per barrel	0.13
Total income per barrel	3.14
Production Tax (7%)	0.22
Royalty (12.5%)	0.36
Lifting Cost per barrel	0.20
Net income per barrel	2.36

Spacing Units

	40 Acre	80 Acre	160 Acre
Ultimate Recovery-bbl	32,650	65,300	130,600
Net Income	\$ 77,050	\$ 154,500	\$ 308,200
Well Cost	171,500	171,500	171,500
Net Profit	(94,450)	(17,000)	136,700
Ratio of income to investment	--	--	1.80 : 1

Lower Penn

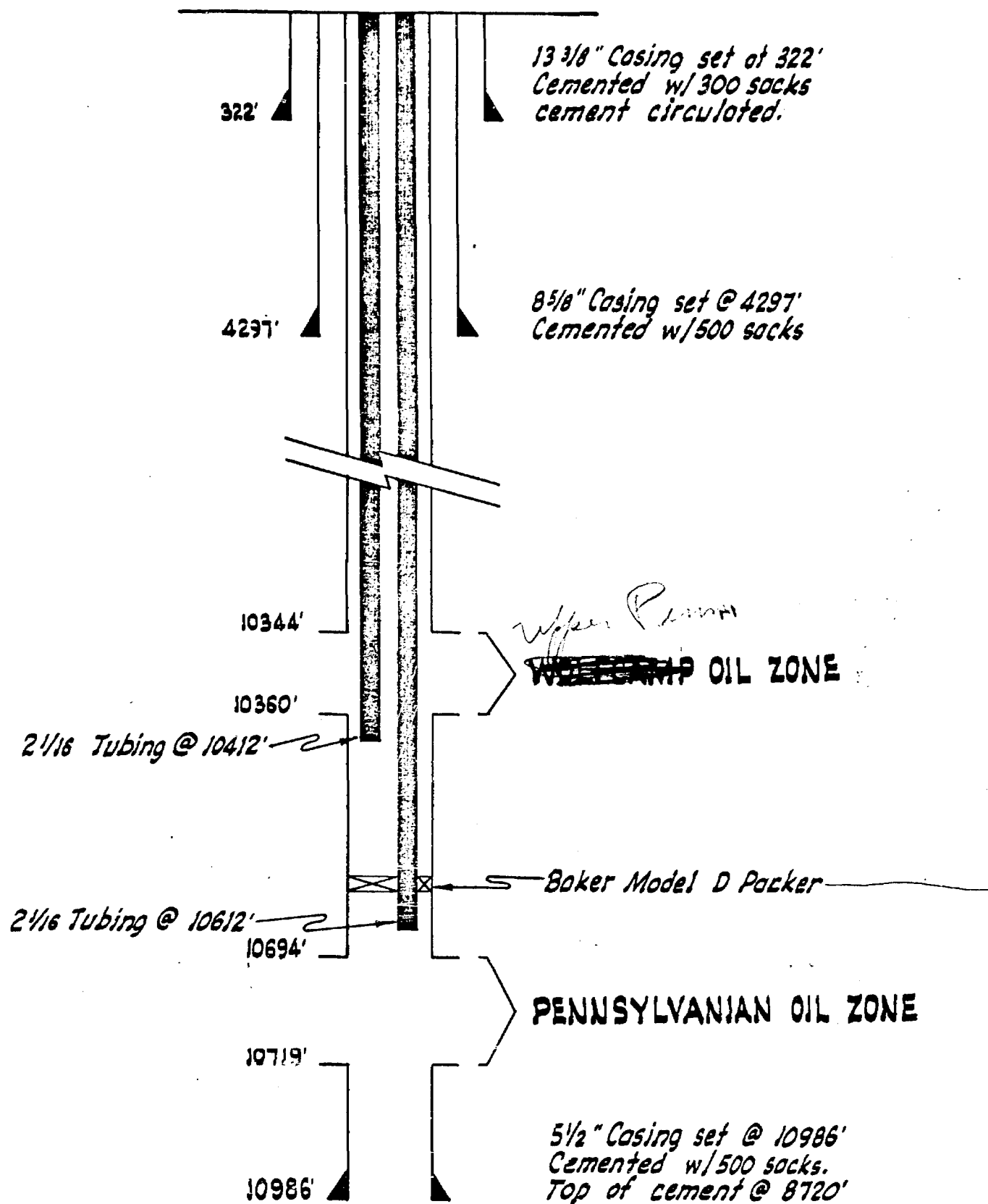
Crude price per barrel	\$ 2.99
Casing head gas revenue per barrel	0.06
Total income per barrel	3.05
Production Tax (7%)	0.21
Royalty (12.5%)	0.35
Lifting Cost per barrel	0.20
Net income per barrel	2.30

Spacing Units

	40 Acre	80 Acre	160 Acre
Ultimate recovery-bbl	40,400	80,800	161,600
Net Income	\$ 92,900	\$ 185,800	\$ 371,700
Well Cost	171,500	171,500	171,500
Net Profit	(78,600)	14,300	200,200
Ratio of income to investment	--	1.08 : 1	2.17 : 1

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
<i>Byrd</i> EXHIBIT NO. <u>20-A</u>
CASE NO. <u>3259</u>

MIDWEST OIL CORPORATION
STATE "C" WELL NO. 1
DUAL COMPLETION INSTALLATION



WELL DATA

MIDWEST OIL CORPORATION
STATE "C" NO. 1

LOCATION:

Unit K, Section 32, T-13-S, R-34-E, Lea County, New Mexico

COMPLETION DATE:

April 30, 1965

TOTAL DEPTH

10,987'

	<u>Upper Zone</u>	<u>Lower Zone</u>
Top of Pay	10,343'	10,692'
Perforated Interval	10,344' - 10,360'	10,694' - 10,719'
Treatment	500 gal M. A.	500 gal M. A.
<u>Initial Potential</u>		
Oil Production	340 bbl. ✓	504 bbl. ✓
Water Production	0	0
Gas-Oil Ratio	946	280
Choke	16/64"	16/64"
Tubing Pressure	475 psig	500 psig

RESERVOIR PROPERTIES

MIDWEST OIL CORPORATION
STATE "C" NO. 1

	<u>UPPER ZONE</u> 14'	<u>LOWER ZONE</u> 23'
Net Pay	6.6%	6.3%
Porosity	30.7%	31.6%
Water Saturation	9 md	430 md
Permeability	1.507	1.21
Formation Volume Factor	3,868 psig	4,068 psig
Original Reservoir Pressure	156° F.	161° F.
Reservoir Temperature	43° F.	38.9° API
Stock Tank Oil Gravity	2,202 psig	1,153 psig
Saturation Pressure	0.319 cp	1.035 cp
Fluid Viscosity at Original Pressure		

RESERVE ESTIMATES
MIDWEST OIL CORPORATION
STATE "C" NO. 1

<u>DATA</u>	<u>UPPER ZONE</u>	<u>LOWER ZONE</u>
Net Pay, feet	14	23
Porosity, percent	6.6	6.3
Water Saturation, percent	30.7	31.6
Formation Volume Factor	1.507	1.21
Recovery Factor, percent	25	25

VOLUMETRIC CALCULATIONS

Upper Zone

$$\begin{aligned}
 \text{Oil In Place} &= \frac{(7758) (0.066) (0.693)}{1.507} \\
 &= 236 \text{ bbl/acre - foot} \\
 \text{Ultimate Recovery} &= (236) (0.25) \\
 &= 59 \text{ bbl/acre - foot} \\
 \text{Ultimate Recovery} &= (59) (14) \\
 &= 826 \text{ bbl/acre}
 \end{aligned}$$

Lower Zone

$$\begin{aligned}
 \text{Oil In Place} &= \frac{(7758) (0.063) (0.684)}{1.21} \\
 &= 276 \text{ bbl/acre - foot} \\
 \text{Ultimate Recovery} &= (276) (0.25) \\
 &= 69 \text{ bbl/acre-foot} \\
 \text{Ultimate Recovery} &= (69) (23) \\
 &= 1587 \text{ bbl/acre}
 \end{aligned}$$

ECONOMICS

MIDWEST OIL CORPORATION
STATE "C" NO. 1

Upper Zone

Crude price per barrel	\$2.86
Casinghead gas revenue per barrel	\$0.13
Total income per barrel	\$2.99
Production tax (6.5%)	\$0.19
Royalty (12.5%)	\$0.35
Lifting cost per barrel	\$0.25
Net income per barrel	\$2.20

S P A C I N G U N I T S

	40 acre	80 acre	160 acre
Gross recovery, barrels	33,000	66,000	132,000
Net income	\$72,600	\$145,200	\$290,400
Well cost	\$190,000	\$190,000	\$190,000
Net profit	(\$117,400)	(\$44,800)	\$100,400
Ratio of profit to investment	-	-	0.53:1

Lower Zone

Crude price per barrel	\$2.84
Casinghead gas revenue per barrel	\$0.07
Total income per barrel	\$2.91
Production tax (6.5%)	\$0.19
Royalty (12.5%)	\$0.34
Lifting cost per barrel	\$0.25
Net income per barrel	\$2.13

S P A C I N G U N I T S

	40 acre	80 acre	160 acre
Gross recovery, barrels	63,500	127,000	254,000
Net income	\$135,250	\$270,500	\$541,000
Well cost	\$190,000	\$190,000	\$190,000
Net Profit	(\$54,750)	80,500	\$351,000
Ratio of profit to investment	-	0.42:1	1.8:1

S P A C I N G U N I T S

	40 acre	80 acre	160 acre
<u>Dual Completion</u>			
Net income, Upper Zone	\$72,600	\$145,200	\$290,400
Net income, Lower Zone	\$135,250	\$270,500	\$541,000
Total net income	\$207,850	\$415,700	\$831,400
Well cost	\$230,000	\$230,000	\$230,000
Net profit	(\$22,150)	\$185,700	\$601,400
Ratio of profit to investment	-	0.81:1	2.61:1

Why not?