CASE 5219: Application of MIDWEST FOR POOL CREATION, DISCOVERY ALLOWABLE AND SPECIAL POOL RULES,

CASE No.

5219

Application,

Transcripts,

Small Exhibits

ETC.

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
April 25, 1974

EXAMINER HEARING

IN THE MATTER OF:

Application of Midwest Oil Corporation for pool creation, discovery allowable and special pool rules, Eddy County, New Mexico

CASE NO. 5219

BEFORE: Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the New Mexico Oil Conservation Commission: William Carr, Esq.
Legal Counsel for the Commission
State Land Office Building
Santa Fe, New Mexico

For the Applicant: Paul Eaton, Esq.
HINKLE, BONDURANT, COX and EATON
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Roswell, New Mexico

I N D E X

E X H I B I T S

	Marked	Offered & Admitted
Applicant's Exhibits Nos. 1 through 7	21	21

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MR. NUTTER: Case 5219.

MR. CARR: Case 5219. Application of Midwest Oil Corporation for pool creation, discovery allowable, and special pool rules, Eddy County, New Mexico.

MR. EATON: Paul Eaton of the firm of Hinkle, Bondurant, Cox and Eaton, representing the Applicant, Midwest Oil Corporation.

MR. CARR: How many witnesses do you have, Mr. Eaton?

MR. EATON: We have two witnesses.

FRANK L. SCHATZ

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

DIRECT EXAMINATION

BY MR. EATON:

Q Would you state your name, your residence and by whom you are employed?

A My name is Frank L. Schatz. I reside in Midland, Texas and am employed by Midwest Oil Corporation, in that City.

Q In what capacity are you employed by Midwest?

A I am the District Exploration Manager for Midwest.

Q What is your profession?

A I am a geologist by trade.

Q Have you previously testified in that capacity before this Commission?

A I have.

Q Mr. Schatz, what does Midwest seek by its Application in this case?

A Midwest seeks a discovery allowable for its No. 4 South Empire Deep Unit Well which was completed in the Wolfcamp. It seeks 80-acre spacing and flexible field rules, flexible spacing.

Q Would you refer to what has been marked for identification as Exhibit No. 1 and state what that exhibit portrays?

A Exhibit No. 1 is a production index map. The well in question is located in Section 32 and there is an arrow pointing to the well. The production is shown or is color-coded and that code is in the lower righthand corner of the map. There is no other Wolfcamp production within two miles of the subject well. I will call your attention to our Well No. 3 which is located in Section 31 and also shown as a Wolfcamp well, however, a later exhibit will show that this is from a different zone in Wolfcamp

and that well was also only tested. It was never completed as an oil well, and after three months, it depleted while it was being tested. It made something like 3000 barrels.

Q Do you have anything else to testify to with respect to this exhibit?

A No, I don't.

Q The area outlined in yellow, what does that mean?

A The area outlined in yellow is the South Empire Deep Unit. This is the unit outline where Midwest is the operator.

Q Now, would you refer to what has been marked for identification as Exhibit No. 2 and state what that exhibit portrays?

A Exhibit No. 2 is a subsurface structure map contoured on the basis of the Wolfcamp. This is as close as we could get to a correlative marker across the area. The subsurface structure points are indicated as minus values on the map and the contours are shown in the dark blue. This shows essentially no interruption in the dip to the southeast across the unit. Superimposed upon this subsurface structure map is a porosity isopach of the productive zone in the Wolfcamp. This is a difficult

map to draw because, as you will note, there is only one well on the map which had any porosity in the productive zone in our No. 4 well. That well had 31 feet of net porosity. None of the wells to the north or to the south as shown on this map had any of the same porosity. We have interpreted this as an east-west trending porosity zone, and we expect it to go out approximately a mile to the north and a mile to the south. We do not know the extent of it because it is a one-point isopack. Again, the unit outline is shown in yellow.

Q Mr. Schatz, does Midwest anticipate drilling additional wells in the area which would tend to give more information with respect to the Wolfcamp there?

A Our plan of development for 1974 is filed with the State and U.S.G.S. and calls for one additional Morrow test in 1974, and we anticipate that location to be in the southwest of the northeast of Section 31, 17 South, 29 East, and that location is shown on the map as an open circle. That well should help us to determine the western extent of the porosity in this Wolfcamp Zone.

Q Now will you refer to what has been marked as Exhibit No. 3 and state what that exhibit portrays?

A Exhibit No. 3 is a stratigraphic cross section of A, A-Prime which extends in a southwest to northeast direction with the index of the location of the cross section shown on the small map at the lower lefthand corner of the cross section.

Q Is "A" at the south?

A "A" is at the southwest end. A-Prime is the northeast end. This line of cross section is also shown on Exhibit 2.

Q Then the well in the Wolfcamp discovery is the fourth well from the left?

A The Wolfcamp discovery is the fourth well from the left and the productive zone is shown as being colored in blue. This is a stratigraphic section set-up on approximately or close to the top of the Cisco formation of the Pennsylvanian. We do not see porosity developed either to the southwest or to the northeast as depicted on this cross section.

Earlier, I discussed -- in discussing Exhibit No. 1 -- that our No. 3, South Empire Deep Unit Well had produced briefly from the Wolfcamp. That productive interval is shown on Well No. 3 from the left with perforations at 8601 to 04.

MR. NUTTER: That would be considerably below this pay in the --

THE WITNESS: (Interrupting) Yes, it is at least 75 to 100 feet below the pay as we correlate that into the No. 4. We did perforate the zone in the No. 4 Well and those perforations are shown on the center of the log with little dots, little open circles. That zone swabbed salt water with no show. This cross section is a little misleading from the standpoint that it is a stratigraphic section and that the zone that we are talking about in the No. 4 Well which produced briefly in the No. 3 Well is actually about 100 feet low structurally to the -- No. 4 Well is 100 feet low to the No. 3 Well. It doesn't look like it here.

BY MR. EATON:

Q Do you have anything that you would like to say with respect to this exhibit?

A No.

Q All right. Would you refer to what has been identified, or marked for identification as Exhibit No. 4 and state what the exhibit portrays?

A Exhibit No. 4 is a Schlumberger Compensated Neutron Formation Density Log. On this log we have shown

drill stem tests that were conducted in the well, the tops, as we have interpreted them, and on the detailed section on the lower part of the log, we have the information pertaining to the drill stem tests written out in more detail. The interval that we are producing from was tested by DST No. 2 which we did not have it open long enough, but it did unload oil when we closed the toolway.

Q Now, Mr. Schatz, would you refer to what has been marked as Exhibit No. 5?

A Exhibit No. 5 is the well completion data sheet on which we have shown pertinent information relative to this well. The Items 11 through Item 15 were supplied to me to be placed on this exhibit by Mr. Printz, our second witness.

Q Were these exhibits prepared by you or under your supervision?

A They were prepared both by me and under my supervision.

MR. EATON: We have no further questions of this witness.

MR. NUTTER: What is your other witness going to testify to?

MR. EATON: Primarily to engineering aspects.

MR. NUTTER: Okay. Are there any questions of Mr. Schatz? You may be excused.

(Witness dismissed.)

EUGENE V. PRINTZ

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

DIRECT EXAMINATION

BY MR. EATON:

Q Would you state your name, residence and for whom you work?

A Eugene V. Printz. I work for Midwest Oil Corporation in Midland, Texas.

Q In what capacity do you work for Midwest, Mr. Printz?

A As a petroleum engineer.

Q Have you previously testified before this Commission?

A No, sir.

Q Would you please give us your educational background?

A I attended the Colorado School of Mines from 1966 to 1970, graduating with a Bachelor of Science degree

in Petroleum Engineering.

Q Since 1970, or since your graduation, what have you done, Mr. Printz?

A I worked two years for City Service Oil Company in Odessa, Texas.

Q What were your duties and responsibilities for City Service?

A I was employed as a production engineer and in charge of an area surrounding Odessa. I was responsible for maintaining production, making work-over studies, remedial recommendations, drilling and completing wells.

Q After your work with City Service, what did you do?

A I worked 8 months for Flag Redfern Oil Company Midland, Texas.

Q What were your responsibilities with Flag Redfern?

A I was petroleum engineer in charge of studying approximately 177 wells, maintaining production, writing work-over recommendations and drilling and completing wells.

Q Since that time, what have you been doing?

A I have worked for Midwest Oil Corporation in Midland, Texas, as a petroleum engineer.

Q In your work and experience since leaving

school, have you worked in southeastern New Mexico?

A Yes, sir. Most of my experience is drilling and completing wells in the Morrow formation.

MR. EATON: Do you have any further questions, Mr. Nutter?

MR. NUTTER: No. The witness is qualified. Please proceed.

BY MR. EATON:

Q Mr. Printz, you are familiar with the Midwest No. 4 South Empire Deep Unit Well?

A Yes, sir.

Q What tests were run on that well?

A I have here the report prepared by Dr.Brownscombe from data supplied by Midwest Oil Corporation as to pressure tests run on the South Empire Deep Unit No. 4 Well.

Q This is the report that has been marked as Exhibit No. 6, is that correct?

A Yes, sir.

Q Please proceed.

A The well was completed. It was perforated, acidized and flowed for a period of time. We produced approximately 5000 barrels of oil and it was shut in for pressure build-up test. Then after the pressure build-up

test, we opened the well for a pressure draw-down test. We flowed it for 24 hours and shut the well in for a second pressure build-up test which ran approximately 24 hours. This is the report of the study of those tests, pressure tests. Pressure Build-up Test No. 1 and the Pressure Follow-up Test suggested a barrier of approximately 400 to 600 feet from the well. The second pressure build-up test showed no barrier. It was cut off too short and the data did not reach the barrier. The Pressure Follow-up Test was calculated and indicated approximately 1.7 million barrels of oil in place in an area of approximately 250 acres. Initial reservoir pressure was 3720 pounds at 84 and 85 feet. The first pressure build-up test indicated the well was opened at the well bore showing no skin effect or damage around the well bore; however, the pressure follow-up test and the second build-up test did indicate there was some damage during the pressure follow-up test which we feel is due to solution gas fracking out around the well bore and creating some permeability damage. We don't think this is permanent, however, but it indicates that at high flow rate there would be some slight damage.

PRINTZ-DIRECT

Q Now, Midwest is seeking or the Application is seeking 80-acre spacing and it is allowable, is that correct?

A Yes, sir.

Q Why does it feel that that is the proper spacing and allowable?

A We feel that the well will drain 80-acre spacing based on the pressure follow-up test and investigating production under 250 acres. We also feel that flowing the well at high rates, at rates greater than the allowable 80-acre spacing would be detrimental to the well.

Q Is it your understanding, Mr. Printz, that there will be further development in the area by your Company?

A Yes, sir.

Q Will that additional development help define this pool?

A Yes, sir. The 250 acres we estimate is a minimum based on this one test. Further development of the area should develop additional acres and certainly prove out the surrounding acreage.

Q Have you prepared an exhibit depicting the

economics of drilling, completing and operating a Wolfcamp well?

A Yes, sir. This is Exhibit 7.

Q That has been marked as Exhibit 7, you say?

A Yes, sir.

Q Will you please state what that exhibit reflects?

A This exhibit shows the economics of drilling, completing and operating cost for the South Empire Deep Unit. Item No. 1 is drilling and completion costs $295,000 per well. This is based on actual invoices taken from our files. Oil price, $11.10 a barrel. Gas price, 22¢ per MCF for low pressure gas. A GOR of 1820 cubic feet per barrel based on our testing. Taxes are 6.5 percent including school tax, severance tax, ad valorem tax, etc. Revenue interest of 87.5 percent to the working interest owner. This is a minimum because there are several tracts of Federal Government which have variable royalty interests.

Q Minimum or maximum?

A They go up with increased production.

Q Actually it would be the maximum rather than --

A (Interrupting) Yes, that's right. This is incorrect on this exhibit. The operating cost per barrel

is estimated at 5¢ per barrel. This is based on a flowing well, based on approximately 500 barrels per month per well. If the well flows 10,000 barrels per month, revenue per barrel would be $9.38 based on these above factors. Barrels of oil to pay out, 31,450 barrels, based on the cost and the cost of the well. Profit to investment in that ratio is: Revenue per barrel, tons of reserve, tons of risk. The reserves, not shown here, are based on the pressure follow-up test and we estimated that at 138,000 barrels per 80 acres. The risk factor was assumed at 75 percent. Using these factors, the profit-to-investment ratio is 3.9 for 80 acres and 1.64 for 40 acres.

Q Mr. Printz, did you testify that in your opinion this No. 4 Well will effectively and efficiently drain 80 acres in your opinion?

A Yes, sir, based on the pressure follow-up test.

Q In your opinion, will establishment of 80-acre spacing on a temporary basis avoid the drilling of unnecessary wells?

A Yes, sir.

Q Will such spacing, in your opinion prevent waste and protect the correlative rights of other owners in the pool?

PRINTZ-DIRECT

A Yes, sir.

Q Was Exhibit 7 prepared by you or under your supervision?

A It was prepared by me.

Q I believe you testified that Exhibit 6 was prepared for Midwest Oil Corporation by Mr. Brownscombe?

A Right, under my supervision.

Q Under your supervision?

A Yes, sir.

MR. EATON: I have no further questions.

MR. NUTTER: Mr. Printz, in your Exhibit No. 7 here where you arrive at revenue per barrel, you are including the value in case you hit gas in that revenue?

THE WITNESS: Yes, sir, based on this gas-oil ratio.

MR. NUTTER: Right. Now, the $295,000 for the cost of the well, was that the cost of the Wolfcamp well?

THE WITNESS: Yes, sir.

MR. NUTTER: That well itself went down to the Morrow, didn't it?

THE WITNESS: This well went to the Morrow. We took the costs and tried to correlate them back to an 8800-foot well.

MR. NUTTER: I see. That is what that proportionate cost would be?

THE WITNESS: That seems very high, however, this is crooked hole country and the drilling contractor said the cost to drill it by a footage basis would be unreal, so he recommended we take it on days worked, and he was right.

MR. NUTTER: On the well completion data sheet, Exhibit No. 5, the IP of the well is given as 303 barrels.

THE WITNESS: Yes, sir.

MR. NUTTER: Is that what the well will make or will it make more than that or less?

THE WITNESS: That is a minimum number. It will make --

MR. NUTTER: (Interrupting) It will make more?

THE WITNESS: It will make more than that.

MR. NUTTER: Now, the 80-acre allowable for a well in the 9000-foot range is 310 barrels per day. Now, you stated that if you flow the well at high rates, you have gas breaking out and affecting the permeability of the reservoir to the oil?

THE WITNESS: Yes, sir.

MR. NUTTER: And that more than an 80-acre

allowable would probably be an excessive rate of production, and yet you have asked for discovery allowable here also. The discovery allowable would have to be tacked on to the top side of a 310 barrel 80-acre allowable and that would be excessive then, wouldn't it?

THE WITNESS: Yes, sir.

MR. NUTTER: According to your testimony?

THE WITNESS: Yes, sir. However, the damage that we noted was calculated from a 685 barrel per day flow rate. There should be some number between this 387 barrel that we flowed on clean-up -- someplace between 387 barrels and this 685 barrels a day.

MR. NUTTER: Wouldn't you say that you would have damage or affect the permeability if you flowed at more than an 80-acre allowable? I understood you to say that.

THE WITNESS: I am sorry. It would have damage if we flowed it at an excessive rate. The specific rate would have to be determined someplace between 387 barrels and 685 barrels.

MR. NUTTER: So now you are saying that production in excess of an 80-acre allowable wouldn't necessarily be harmful to the well?

THE WITNESS: Yes, sir, but a limited excess.

MR. NUTTER: I don't have a calculator or slide rule with me, but you are asking for 42,000 barrels of oil discovery allowable which produced over a two-year period which would be 42,000 divided by 730 days and it would probably be around 60 barrels a day or somewhere in that vicinity.

THE WITNESS: We flowed the well on clean-up at 387 barrels per day.

MR. NUTTER: Okay. Divide 42,245 by 730.

THE WITNESS: 58.

MR. NUTTER: 58 barrels per day would be the discovery allowable on top of a 310 barrel regular allowable which gives the well a total allowable of 368 barrels per day?

THE WITNESS: Yes, sir.

MR. NUTTER: In your opinion, the well could sustain a 368-barrel per day producing rate without damage to the well or the reservoir?

THE WITNESS: Yes, sir. This damage that we calculated we feel is due to solution gas and wouldn't necessarily be permanent.

MR. NUTTER: Well, it would be breaking out

PRINTZ-DIRECT

around the well bore and affecting the relative permeability to the oil?

THE WITNESS: Right.

MR. NUTTER: Are there any other questions of Mr. Printz? You may be excused.

(Witness dismissed.)

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

MR. EATON: We offer Exhibits 1 through 7 into evidence.

MR. NUTTER: Midwest's Exhibits 1 through 7 will be admitted in evidence.

(Whereupon, Applicant's Exhibits Nos. 1 through 7 were marked for identification and admitted into evidence.)

MR. NUTTER: Does anyone have anything they wish to offer in Case No. 5219?

MR. CARR: Mr. Examiner, we have certain correspondence concerning this case. We received a letter from General American Oil Company of Texas. General American is the owner of 6.105 percent working interest in the South Empire Deep Unit and owner and operator of certain acreage offsetting the South Empire Deep Unit

PRINTZ-DIRECT

No. 4 and they have requested the following be read into the record:

(Reading) General American Oil Company of Texas supports Midwest Oil Company's request for 80-acre spacing rules for the new Wolfcamp Field discovered in the South Empire Deep Unit No. 4 Well. General American Oil Company of Texas, however, respectfully requests that the New Mexico Oil Conservation Commission grant these rules on a temporary basis pending additional information on this reservoir to be obtained by future drilling and producing operations. (End of reading.)

We have received a telegram from a Mr. D. D. Myers, Assistant Production Manager of Tenneco Oil Company which reads in part as follows:

(Reading) Tenneco is one-half working interest owner of the acreage in the north half of Section 33, Township 17 South, Range 29 East. We support the Application for discovery allowable, however, we oppose the special rules that provide for 80-acre spacing. We believe that the economics associated with recoverable reserves from only 80 acres could be marginal. In addition, an existing pressure draw-down and build-up test conducted on the entire South Empire Deep Unit No. 4

PRINTZ-DIRECT

indicates that this well could drain an area as large as 160 acres. In view of these facts, Tenneco requests that the temporary field rule that provides for 160-acre spacing be adopted. (End of reading.)

MR. NUTTER: That is outside the scope of the hearing. He can't do that. Thank you, Mr. Carr.

Does anyone else have anything they wish to offer in Case 5219?

We will take the case under advisement.

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

I, RICHARD L. NYE, Court Reporter, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me, and the same is a true and correct record of the said proceedings, to the best of my knowledge, skill and ability.

COURT REPORTER

I do Hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 5219 heard by me on 4/25, 19 74.

Examiner
New Mexico Oil Conservation Commission

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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
April 16, 1975

EXAMINER HEARING

IN THE MATTER OF:

Case 5219 being reopened pursuant to the provisions of Order No. R-4784, which order established temporary special pool rules for the South Empire-Wolfcamp Pool, Eddy County, New Mexico, including a provision for 80-acre spacing.

CASE NO. 5219

BEFORE: Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

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MR. NUTTER: Case 5219.

MR. CARR: Case 5219. In the matter of Case 5219 being reopened pursuant to the provisions of Order No. R-4784, which order established temporary special pool rules for the South Empire-Wolfcamp Pool, Eddy County, New Mexico, including a provision for 80-acre spacing.

MR. KELLY: Booker Kelly of White, Koch, Kelly and McCarthy, Santa Fe, New Mexico, on behalf of the Applicant. We have one witness and ask that he be sworn.

(Witness sworn.)

DANIEL R. CURRENS

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

DIRECT EXAMINATION

BY MR. KELLY:

Q Would you please state your full name, by whom employed and in what capacity?

A Daniel R. Currens, Senior Staff Engineer, Amoco Production Company.

Q Have you previously been qualified as an expert witness in the field of petroleum engineering before this Commission?

A Yes, sir, I have.

Q Referring to Exhibit No. 1, would you bring the Examiner up to date? First, we might give him a brief history of this pool and then bring him up-to-date on what has happened since the last hearing.

A All right, sir. Exhibit No. 1 is a map showing structural contours on a Wolfcamp marker. This is a marker in the Wolfcamp and it is a marker that we have found to be associated with the pay in our Wolfcamp discovery in this area. Shown on the map in a yellow outline is the Empire South Deep Unit and further shown on the map is a red circle. It is Empire South Deep Unit Well No. 4 which is the discovery well for the pool that is the subject of this Hearing today. That well is located in Unit G of Section 32, Township 17 South, Range 29 East in Eddy County, New Mexico.

The other symbols that are shown on the map are other wells that have been drilled through the Wolfcamp in the area. Primarily, they are Morrow-gas completions or Morrow-gas tests that were drilled deeper and divide the structural control. You will note that the control doesn't really extend down to the southeast. Most of the wells that have been drilled are just pretty well on a southwest-northeast trend. Now, the only producer that we have in the South Empire-Wolfcamp pool is the Well No. 4.

There was one other Wolfcamp producer very briefly in the area and that is Well No. 3 that is shown in Section 31. This well had a completion attempt in the Wolfcamp. It produced about 3000 barrels and was plugged and abandoned.

I believe that is about all I have to say with respect to Exhibit 1, except that this is some sort of structural trap. I don't really see our production right now associated with anything other than a porosity permeability developed trend.

Q What is the proration unit assigned to, your Well No. 4?

A It would be the west half of the northeast quarter of Section 32, 80 acres.

Q Going on to Exhibit No. 2, would you explain the significance of that?

A Exhibit 2 is a performance curve that we had on our well No. 4 from discovery to this point. The well was completed in May of 1974 through perforations from 8449 to 8522 and a potential flowing 303 barrels of oil with no water, a 1380 gas-oil ratio, 46-degree gravity crude on a 24-hour test.

Now, the production that is plotted here for oil, you will note was fairly constant for several months at

around 350 barrels a day. This well has a basic allowable of 310 barrels of oil a day, plus a discovery bonus allowable of 58 barrels a day for a total of 368. Then the well started on decline and declined from those rates, around 350 barrels a day all the way down to 115 barrels a day in January. We went in to see if depletion had taken place or just what and discovered that we had some parafin problems in our tubing. We cut the parafin and the well has come back very very nicely, such that it is now capable of producing -- well, in February, about 400 barrels a day and the March production averaged 417, but I will tell you that that is not corrected yet for temperature corrections, B. S. and W.

You will note in the upper curve that the gas-oil ratio, even though it is a very short period, indicates that it is fairly constant. It is about 1200-cubic feet per barrel now. It was -- the potential test showed 1380 to 1 for a gas-oil ratio, so we still seem to be above the bubble point. Cumulative production is about 100,000 barrels.

I mentioned the bottomhole pressure, and I think that has significance here too. The initial bottomhole pressure taken in 1974 was 3691 PSI and the pressure taken

in March of '75 with the same datum was 2776, so we have had a 915 PSI loss in that 10 or 11 months.

MR. NUTTER: When was that first pressure measured?

THE WITNESS: I have that on 4/1/74 is the date I have it. Amoco was not the operator at that time. I think that is a good --

MR. NUTTER: (Interrupting) That first pressure was April 1st of '74 and the second one was March what?

THE WITNESS: March the 8th of '75, with a 915 pound decline in pressure during that time. As I say, we still seem to be above the bubble point, so I think performance data indicates that we have a good drainage radius here, that one well is capable of draining a significant area and that certainly 80-acre rules seem to be justified for continuous performance.

BY MR. KELLY:

Q Do you feel there is any evidence that this rate of withdrawal on 80-acre spacing is affecting the reservoir in any adverse way at all?

A No, I don't see that at all. I don't believe that rate is too high by any means.

Q Do you expect there will be additional drilling?

A We are certainly looking at it very closely right

now, if we can find another good spot there.

Q Would you recommend that the temporary rules be made permanent at this time?

A Yes, sir, I would.

Q Do you see that the making permanent of these rules would have any adverse effect on correlative rights?

A No, sir. I believe correlative rights are very well protected in here. This Wolfcamp is in a participating area that consists of Section 32 as well as the southwest quarter of Section 33.

Q And the drilling of wells on a 40-acre spacing would be unnecessary expense, I assume, in this situation?

A It does not appear necessary at this time. Of course, the existing rule does provide that wells can be drilled on both 40-acre tracts, and if it were necessary, it would be covered under these 80-acre rules.

Q Were Exhibits 1 and 2 prepared by you or under your supervision?

A Yes, they were.

MR. KELLY: We move the introduction of Amoco's Exhibits 1 and 2.

MR. NUTTER: Amoco's Exhibits 1 and 2 will be admitted in evidence.

CURRENS-CROSS

(Whereupon, Applicant's Exhibits Nos. 1 and 2 were marked for identification, and were offered and admitted into evidence.)

MR. KELLY: That completes our direct examination.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Currens, you mentioned that this Well No. 3 in Section 31 had produced 3000 barrels from the Wolfcamp and then we've got your Well No. 4 which we are talking about here today. Has there been any other test of the Wolfcamp made anywhere in this area?

A In this area there were drill stem tests run by the former operator of this unit on Well No. 1, which is located in Section 6, and that drill-stem test recovered 1000 feet of oil and approximately 7000 feet of heavy gas-cut mud. There was no completion attempt made. Well No. 2, which is just south of Well No. 1 and also in Section 6 had a drill-stem test in the Wolfcamp that recovered 675 feet of oil and 100 feet of heavy oil and gas-cut mud, and again, no completion attempt was made. Other than that, I don't know of any tests that have been made of the Wolfcamp in the area. Log evaluation certainly has been made of them, particularly in the Tenneco Well in

Section 33 which is near this well. It didn't appear to have a developed porosity zone.

Q Okay, now, you've got the one well which has been producing since early 1974. Does Amoco have any plans for any further drilling in the Wolfcamp formation in this area?

A We are looking at it very closely right now. We acquired the operation of this unit last summer, along with a number of other properties that Mid-West had operated and, just frankly, we haven't gotten through all of them to the extent we would like to yet, but we have just gotten pressure information and discovered what our mechanical problem was on this well and we are looking for another location right now.

Q Now, there are a number of Morrow wells here. Do you have any plans for any additional development in the Morrow formation?

A I believe our plan of development for this year calls for at least three additional Morrow wells.

Q And this will give you an opportunity to look at the Wolfcamp formation?

A It certainly will. No. 4 was originally a Morrow test and it was dry in the Morrow, and we found the Wolfcamp.

Q So, you have prospects for at least three additional looks at the Wolfcamp formation?

A We sure do.

Q Now, at the original Hearing of Case No. 5219, Exhibit No. 5 gave some formation and reservoir data. Have you examined this case file in the original?

A I had an opportunity to look through it briefly, but I haven't had a chance to study it and, unfortunately, I have not found those exhibits in the file that we took over from Mid-West.

Q So, you don't know whether you concur with the information that is in here or not?

A No, sir, I don't.

MR. NUTTER: Are there any further questions of Mr. Currens?

MR. KELLY: Nothing further.

MR. NUTTER: He may be excused.

(Witness dismissed.)

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

MR. KELLY: No, sir, I do not.

MR. NUTTER: Does anyone have anything they wish to offer in Case No. 5219? If not, we will take the case under advisement.

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

I, RICHARD L. NYE, Court Reporter, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me, and the same is a true and correct record of the said proceedings, to the best of my knowledge, skill and ability.

COURT REPORTER

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 5219, heard by me on 4/16, 1975.

, Examiner
New Mexico Oil Conservation Commission

THE NYE REPORTING SERVICE
STATE-WIDE DEPOSITION NOTARIES
225 JOHNSON STREET
SANTA FE, NEW MEXICO 87501
TEL. (505) 982-0386

OIL CONSERVATION COMMISSION

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

May 6, 1975

I. R. TRUJILLO
CHAIRMAN

LAND COMMISSIONER
PHIL R. LUCERO
MEMBER

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

Mr. Booker Kelly
White, Koch, Kelly & McCarthy
Attorneys at Law
Post Office Box 787
Santa Fe, New Mexico

Re: CASE NO. 5219
ORDER NO. R-4784-A

Applicant:

OCC

Dear Sir:

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

Very truly yours,

A. L. Porter, Jr.

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

Copy of order also sent to:

Hobbs OCC x
Artesia OCC x
Aztec OCC

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. 5219
Order No. R-4784-A

IN THE MATTER OF CASE NO. 5219 BEING
REOPENED PURSUANT TO THE PROVISIONS OF
ORDER NO. R-4784, WHICH ORDER ESTABLISHED
TEMPORARY SPECIAL POOL RULES FOR THE SOUTH
EMPIRE-WOLFCAMP POOL, EDDY COUNTY, NEW
MEXICO, INCLUDING A PROVISION FOR 80-ACRE
SPACING.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on April 16, 1975, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 6th day of May, 1975, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

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

(2) That by Order No. R-4784, dated May 21, 1974, temporary special rules and regulations were promulgated for the South Empire-Wolfcamp Pool, Eddy County, New Mexico, establishing temporary 80-acre spacing units.

(3) That pursuant to the provisions of Order No. R-4784, this case was reopened to allow the operators in the subject pool to appear and show cause why the South Empire-Wolfcamp Pool should not be developed on 40-acre spacing units.

(4) That the evidence establishes that one well in the South Empire-Wolfcamp Pool can efficiently and economically drain and develop 80 acres.

(5) That the Special Rules and Regulations promulgated by Order No. R-4784 have afforded and will afford to the owner of each property in the pool the opportunity to produce his just and equitable share of the oil in the pool.

(6) 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-4784 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 South Empire-Wolfcamp Pool, Eddy County, New Mexico, promulgated by Order No. R-4784, 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 herein-above designated.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

I. R. TRUJILLO, Chairman

PHIL R. LUCERO, Member

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

S E A L

jr/

Bill Thorsen

80-acres no specific spacing

top-btm of perfs

8469' 8522'

42245

2 &4490

TOM -

THE ATTACHED CASE 5219 SHOULD BE REOPENED AT EITHER THE MAY 14th OR MAY 28 EXAMINER HEARINGS.

THANK YOU - IDA

Wan set Case for April 16th

Docket No. 9-75

Dockets Nos. 10-75 and 11-75 are tentatively set for hearing on April 30, and May 14, 1975. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: EXAMINER HEARING - WEDNESDAY - APRIL 16, 1975

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

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

ALLOWABLE: (1) Consideration of the allowable production of gas from seventeen prorated pools in Lea, Eddy, Roosevelt and Chaves Counties, New Mexico, for May, 1975;

(2) Consideration of the allowable production of gas from five prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico, for May, 1975.

CASE 5415: (Continued from the March 19, 1975, Examiner Hearing)

Application of Burk Royalty Co., for a unit agreement, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks approval for the Double L Queen Unit Area, comprising 2670 acres, more or less, of Federal, State, and fee lands in Townships 14 and 15 South, Ranges 29 and 30 East, Chaves County, New Mexico.

CASE 5454: Application of Burk Royalty Co. for a waterflood project, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in the Double L-Queen Pool, Chaves County, New Mexico, by the injection of water into the Queen formation through 17 wells located in Sections 23, 24, 25, and 36, Township 14 South, Range 29 East; Section 31, Township 14 South, Range 30 East; Sections 1 and 12, Township 15 South, Range 29 East, and Sections 6, 7, and 18, Township 15 South, Range 30 East.

CASE 5455: Application of Roger C. Hanks for the amendment of Order No. R-4158, as amended, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the amendment of Order No. R-4158, which, as amended, authorizes the disposal of produced salt water into the Devonian formation through 2 7/8-inch tubing set in a packer at approximately 10,000 feet via the perforated interval from 10,220 feet to 10,504 feet in his Monsanto Foster Well No. 1, located in Unit D of Section 5, Township 20 South, Range 25 East, Dagger Draw Area, Eddy County, New Mexico. Applicant proposes the amendment of said order to permit setting the packer at 6271 feet or in the alternative, to block squeeze said well from 4000 feet to 6500 feet and set said packer at approximately 4000 feet.

CASE 5456: Application of Southern Union Production Co. for a dual completion, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the dual completion (conventional) of its Shelby Federal Well No. 1, located in Unit H of Section 13, Township 22 South, Range 24 East, Eddy County, New Mexico, in such a manner as to produce undesignated Strawn and Atoka gas through the casing-tubing annulus and tubing, respectively.

CASE 5457: Application of Texaco Inc., for downhole commingling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of East Weir-Blinebry, Monument-Tubb, and Skaggs-Drinkard production in the wellbore of its M. B. Weir "B" Well No. 10, located in Unit P of Section 12, Township 20 South, Range 37 East, Lea County, New Mexico.

CASE 5219: (Reopened)

In the matter of Case 5219 being reopened pursuant to the provisions of Order No. R-4784, which order established temporary special pool rules for the South Empire-Wolfcamp Pool, Eddy County, New Mexico, including a provision for 80-acre spacing. All interested parties may appear and show cause why said pool should not be developed on 40-acre spacing.

CASE 5458: Application of Continental Oil Co. for two non-standard gas proration units and three unorthodox locations, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the two following described non-standard gas proration units in Township 20 South, Range 37 East, Eumont Gas Pool, Lea County, New Mexico:

A 240-acre unit comprising the SW/4 and S/2 NW/4 of Section 15 to be dedicated to applicant's Britt "B" Well No. 3 at an unorthodox location in Unit L of said Section 15; and

A 280-acre unit comprising the SW/4 NW/4 and SW/4 of Section 10 and the N/2 NW/4 of Section 15 to be dedicated to applicant's Britt "B" Wells Nos. 15 and 25 located, respectively, at unorthodox locations in Units M of Section 10 and C of Section 15.

OIL CONSERVATION COMMISSION

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

I. R. TRUJILLO
CHAIRMAN
LAND COMMISSIONER
ALEX J. ARMIJO
MEMBER
STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY – DIRECTOR

May 21, 1974

Re: CASE NO. 5219
ORDER NO. R-4784

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

Applicant:
Midwest Oil Corporation

DOCKET MAILED
Date April 16, 1974

Dear Sir:

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

Very truly yours,

A. L. Porter, Jr.

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

Copy of order also sent to:

Hobbs OCC x
Artesia OCC x
Aztec OCC

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. 5219
Order No. R-4784

NOMENCLATURE

APPLICATION OF MIDWEST OIL
CORPORATION FOR POOL CREATION,
DISCOVERY ALLOWABLE, AND SPECIAL
POOL RULES, EDDY COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on April 25, 1974, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 21st day of May, 1974, 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 a new pool for production of oil from the Wolfcamp formation, Eddy County, New Mexico, and for promulgation of special rules and regulations for said pool, including a provision for 80-acre proration units.

(3) That the applicant also seeks the assignment of an oil discovery allowable in the amount of approximately 42,245 barrels to the discovery well for said pool.

(4) That the evidence presently available indicates that the Midwest Oil Corporation South Empire Deep Unit Well No. 4, located in Unit G of Section 32, Township 17 South, Range 29 East, NMPM, Eddy County, New Mexico, has discovered a separate common source of supply which should be designated the South Empire-Wolfcamp Pool; that the vertical limits of said pool should be defined as the Wolfcamp formation, and that the horizontal limits of said pool should be defined as the NE/4 of said Section 32.

(5) That the subject discovery well for the aforesaid pool is entitled to and should receive a bonus discovery oil allowable in the amount of 42,245 barrels, based upon the top of the perforations in said well at 8,449 feet, to be assigned over a two-year period.

(6) 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 80-acre spacing units should be promulgated for the South Empire-Wolfcamp Pool.

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

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

(9) That this case should be reopened at an examiner hearing in May, 1975, at which time the operators in the subject pool should be prepared to appear and show cause why the South Empire-Wolfcamp Pool should not be developed on 40-acre spacing units.

IT IS THEREFORE ORDERED:

(1) That a new pool for the production of oil from the Wolfcamp formation is hereby established and designated the South Empire-Wolfcamp Pool.

(2) That the vertical limits of said pool are the Wolfcamp formation and the horizontal limits are the NE/4 of Section 32, Township 17 South, Range 29 East, NMPM, Eddy County, New Mexico.

(3) That the Midwest Oil Corporation South Empire Deep Unit Well No. 4, located in Unit G of Section 32, Township 17 South, Range 29 East, South Empire-Wolfcamp Pool, Eddy County, New Mexico, is hereby authorized an oil discovery allowable of 42,245 barrels to be assigned to said well at the rate of 58 barrels per day in accordance with Rule 509 of the Commission Rules and Regulations.

(4) That temporary Special Rules and Regulations for the South Empire-Wolfcamp Pool, Eddy County, New Mexico, are hereby promulgated as follows:

SPECIAL RULES AND REGULATIONS
FOR THE
SOUTH EMPIRE-WOLFCAMP POOL

RULE 1. Each well completed or recompleted in the South Empire-Wolfcamp Pool or in the Wolfcamp formation within one mile thereof, and not nearer to or within the limits of another designated Wolfcamp 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 80 acres, more or less, consisting of the N/2, S/2, E/2, or W/2 of a governmental quarter section; provided however, that nothing contained herein shall be construed as prohibiting the drilling of a well on each of the quarter-quarter sections in the unit.

RULE 3. The Secretary-Director of the Commission may grant an exception to the requirements of Rule 2 without notice and hearing when an application has been filed for a non-standard unit comprising a governmental quarter-quarter section or lot, 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 a governmental quarter-quarter section or lot.

RULE 5. The Secretary-Director may grant an exception to the 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. All operators offsetting the proposed 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 operators offsetting the proposed location or if no objection to the unorthodox location has been entered within 20 days after the Secretary-Director has received the application.

RULE 6. A standard proration unit (79 through 81 acres) shall be assigned a depth bracket allowance of 310 barrels of oil perdday, subject to the market demand percentage factor, and in the event there is more than one well on an 80-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 80 acres.

IT IS FURTHER ORDERED:

(1) That the locations of all wells presently drilling to or completed in the South Empire-Wolfcamp Pool or in the Wolfcamp formation within one mile thereof are hereby approved; that the operator of any well having an unorthodox location shall notify the Artesia District Office of the Commission in writing of the name and location of the well on or before July 1, 1974.

(2) That, pursuant to Paragraph A. of Section 65-3-14.5, NMSA 1953, contained in Chapter 271, Laws of 1969, existing wells in the South Empire-Wolfcamp Pool shall have dedicated thereto 80 acres in accordance with the foregoing pool rules; or, pursuant to Paragraph C. of said Section 65-3-14.5, existing wells may have non-standard spacing or proration units established by the Commission and dedicated thereto.

Failure to file new Forms C-102 with the Commission dedicating 80 acres to a well or to obtain a non-standard unit approved by the Commission within 60 days from the date of this order shall subject the well to cancellation of allowable. Until said Form C-102 has been filed or until a non-standard unit has been approved, and subject to said 60-day limitation, each well presently drilling to or completed in the South Empire-Wolfcamp Pool or in the Wolfcamp formation within one mile thereof shall receive no more than one-half of a standard allowable for the pool.

(3) That this case shall be reopened at an examiner hearing in May, 1975, at which time the operators in the subject pool may appear and show cause why the South Empire-Wolfcamp 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

I. R. TRUJILLO, Chairman

ALEX J. ARMIJO, Member

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

S E A L
jr/

MGMABQC ABQ
2-039618E114 04/24/74
ICS IPMBNGZ CSP
3032929920 MGM TDBN DENVER CO 162 04-24 0630P EDT
ZIP 87501

western union **Mailgram**

UNITED STATES POSTAL SERVICE

A L PORTER, JR, SECRETARY DIRECTOR
NEW MEXICO OIL CONSERVATION COMMISSION STATE LAND OFFICE BLDG
SANTA FE NM 87501

RE: CASE 5219 APPLICATION OF MIDWEST OIL CORPORATION FOR POOL CREATION, DISCOVERY ALLOWABLE AND SPECIAL POOL RULES, WOLFCAMP FORMATION, EDDY COUNTY NEW MEXICO. TENNECO IS 1/2 WORKING INTEREST OWNER OF THE ACREAGE IN THE N/2 SECTION 33, T17S-R29E. WE SUPPORT THE APPLICATION FOR DISCOVERY ALLOWABLE, HOWEVER, WE OPPOSE THE SPECIAL RULES THAT PROVIDE FOR 80 ACRE SPACING. WE BELIEVE THAT THE ECONOMICS ASSOCIATED WITH THE RECOVERABLE RESERVES FROM ONLY 80 ACRES COULD BE MARGINAL. IN ADDITION, AN EXISTING PRESSURE DRAWN DOWN AND BUILT UP TEST CONDUCTED ON THE ENTIRE SOUTH DEEP UNIT NUMBER 4 INDICATES THAT THIS WELL COULD DRAIN AN AREA AS LARGE AS 160 ACRES. IN VIEW OF THESE FACTS, TENNACO REQUESTS THAT TEMPORARY FIELD RULES THAT PROVIDE FOR 160-ACRE SPACING BE ADOPTED.
D D MYERS ASSISTANT PRODUCTION MANAGER TENNACO OIL COMPANY
1860 LINCOLN STREET SUITE 1200 DENVER COLORADO 80203

1834 EDT

MGMABQC ABQ

(Case 5221 continued from Page 1)

said well having been projected as an oil well at a standard location for Delaware oil wells. Applicant further seeks approval of a 201.34-acre non-standard gas proration unit for said well comprising the NE/4 of said Section 4.

CASE 5222: Application of Amoco Production Company for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Pavo Mesa Unit Area comprising 2,560 acres, more or less, of State and Federal lands in Township 16 South, Range 28 East, Eddy County, New Mexico.

CASE 5223: Application of Continental Oil Company for a 320-acre non-standard gas proration unit, simultaneous dedication of acreage, and reinstatement of cancelled underproduction, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for a 320-acre non-standard gas proration unit comprising the N/2 of Section 17, Township 24 South, Range 37 East, Jalmat Gas Pool, Lea County, New Mexico, to be simultaneously dedicated to its Jack B-17 Wells Nos. 3 and 4 located 990 feet from the North and East lines and 990 feet from the North line and 1980 feet from the West line, respectively, of said Section 17. Applicant further seeks the reinstatement of the underproduction which was cancelled November 1, 1973, when the aforesaid proration unit was reclassified to marginal status.

CASE 5224: Application of Phillips Petroleum Company for a dual completion, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the dual completion (conventional) of its James "E" Well No. 1 located in Unit G of Section 11, Township 22 South, Range 30 East, Cabin Lake Field, Eddy County, New Mexico, in such a manner as to produce gas from the Strawn and Morrow formations through parallel strings of tubing.

CASE 5225: Application of Fluid Power Pump Company, Petro Lewis Corporation, and Partnership Properties Company for compulsory pooling, Sandoval County, New Mexico. Applicants, in the above-styled cause, seek an order pooling all mineral interests in the Media-Entrada Oil Pool underlying the NW/4 of Section 22, Township 19 North, Range 3 West, Sandoval County, New Mexico, to be dedicated to the Fluid Power Pump Company Well No. 5 located in Unit C of said Section 22.

CASE 5226: Application of Inexco Oil Company for pool creation and special pool rules, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new Morrow gas pool for its Fasken El Paso Federal Well No. 1 located in the SW/4 NW/4 of Section 3, Township 21 South, Range 26 East, Eddy County, New Mexico, and the promulgation of special pool rules therefor, including a provision for 640-acre spacing units for Sections 7 through 12, Township 21 South, Range 26 East, and the adoption of 480-acre non-standard spacing units comprising either the N/2 or S/2 of Sections 1 through 6, Township 21 South, Range 26 East, and Section 7, Township 21 South, Range 27 East.

Docket No. 11-74

DOCKET: EXAMINER HEARING - THURSDAY - APRIL 25, 1974

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

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

CASE 5206: (Continued from the April 10, 1974, Examiner Hearing)

Application of Continental Oil Company for downhole commingling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to commingle West Warren-Blinebry and East Skaggs-Drinkard production in the wellbore of its SEMU Burger Well No. 21 located in Unit O of Section 19, Township 20 South, Range 38 East, Lea County, New Mexico.

CASE 5209: (Continued from the April 10, 1974, Examiner Hearing)

Application of Union Oil Company of California for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Estacado Unit Area comprising 1280 acres, more or less, of State and fee lands in Township 14 South, Range 35 East, Lea County, New Mexico.

CASE 5219: Application of Midwest Oil Corporation for pool creation, discovery allowable, and special pool rules, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new oil pool for Wolfcamp production for its South Empire Deep Unit Well No. 4 located in Unit G of Section 32, Township 17 South, Range 29 East, Eddy County, New Mexico, and for the promulgation of special pool rules therefor, including a provision for 80-acre spacing. Applicant further seeks the assignment of approximately 42,245 barrels of oil discovery allowable to the aforesaid well.

CASE 5220: Application of Atlantic Richfield Company for an unorthodox gas well location and non-standard proration unit, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of its McDonald State WN Well No. 24 located 1780 feet from the North line and 660 feet from the West line of Section 25, Township 22 South, Range 36 East, Jalmat Gas Pool, Lea County, New Mexico, to be dedicated to a 320-acre non-standard gas proration unit comprising the N/2 of said Section 25.

CASE 5221: Application of Black River Corporation for an unorthodox gas well location and a non-standard proration unit, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of its BR 4 Federal Well No. 3 located 1986 feet from the North line and 330 feet from the East line of Section 4, Township 26 South, Range 24 East, undesignated Delaware gas pool, Eddy County, New Mexico,

CASE 5227: Application of Morris R. Antwell for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Pennsylvanian formation underlying Lots 9 through 16 of Section 4, Township 21 South, Range 26 East, Eddy County, New Mexico, to form a standard 320-acre gas proration unit to be dedicated to a well to be drilled at a standard location for said unit. Also to be considered will be the cost of drilling and completing said well and the allocation of such costs, as well as actual operating costs and charges for supervision. Also to be considered is the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 5228: Application of David Fasken for the creation of two pools and a dual completion, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a Strawn gas pool and a Morrow gas pool for his El Paso 3 Federal Well No. 1 located 2724 feet from the North line and 2870 feet from the East line of Section 3, Township 21 South, Range 26 East, Eddy County, New Mexico. Applicant further seeks approval for the dual completion of said well to produce gas from the Strawn and Morrow formations through parallel strings of tubing.

CASE 5207: (Continued from the April 10, 1974, Examiner Hearing)

Application of Craig Folson for a non-standard proration unit and compulsory pooling, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests underlying a non-standard oil proration unit comprising the SW/4 NE/4 SE/4, NW/4 SE/4 SE/4, NE/4 SW/4 SE/4, and the SE/4 NW/4 SE/4 of Section 12, Township 13 South, Range 31 East, Caprock-Queen Pool, Chaves County, New Mexico, to be dedicated to a well to be drilled at an unorthodox location 1340 feet from the South line and 1300 feet from the East line of said Section 12, said location having been previously been approved by Order No. R-4750. Also to be considered will be the cost of drilling and completing said well and the allocation of such costs, as well as actual operating costs and charges for supervision. Also to be considered is the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 5208: (Continued from the April 10, 1974, Examiner Hearing)

Application of S. P. Yates for an exception to Order No. R-3221, as amended, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks, as an exception to Order No. R-3221, as amended, authority to dispose of produced salt water in an unlined surface pit on its Federal LC 065598 lease in the SW/4 SW/4 of Section 4, and the NE/4 of Section 5, Township 17 South, Range 30 East, Square Lake Pool, Eddy County, New Mexico.

GENERAL AMERICAN OIL COMPANY OF TEXAS
MEADOWS BUILDING
DALLAS, TEXAS 75206

April 19, 1974

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

Attention Mr. Daniel S. Nutter, Examiner

RE: Case #5219, April 25, 1974
Examiner Hearing - Midwest Oil Corporation
for Pool Creation, Discovery Allowable,
and Special Pool Rules.
Eddy County, New Mexico

Gentlemen:

Pursuant to the above application, General American Oil Company of Texas, owner of 6.105% working interest in the South Empire Deep Unit, and owner and operator of certain acreage offsetting the South Empire Deep Unit #4 Discovery, wishes to make the following statement at the referenced Examiner Hearing:

"General American Oil Company of Texas supports Midwest Oil Company's request for 80 acre spacing rules for the new Wolfcamp Field discovered in the South Empire Deep Unit #4 Well. General American Oil Company of Texas, however, respectfully requests that the New Mexico Oil Conservation Commission grant these rules on a temporary basis pending additional information on this reservoir to be obtained by future drilling and producing operations."

Yours very truly,

GENERAL AMERICAN OIL COMPANY OF TEXAS

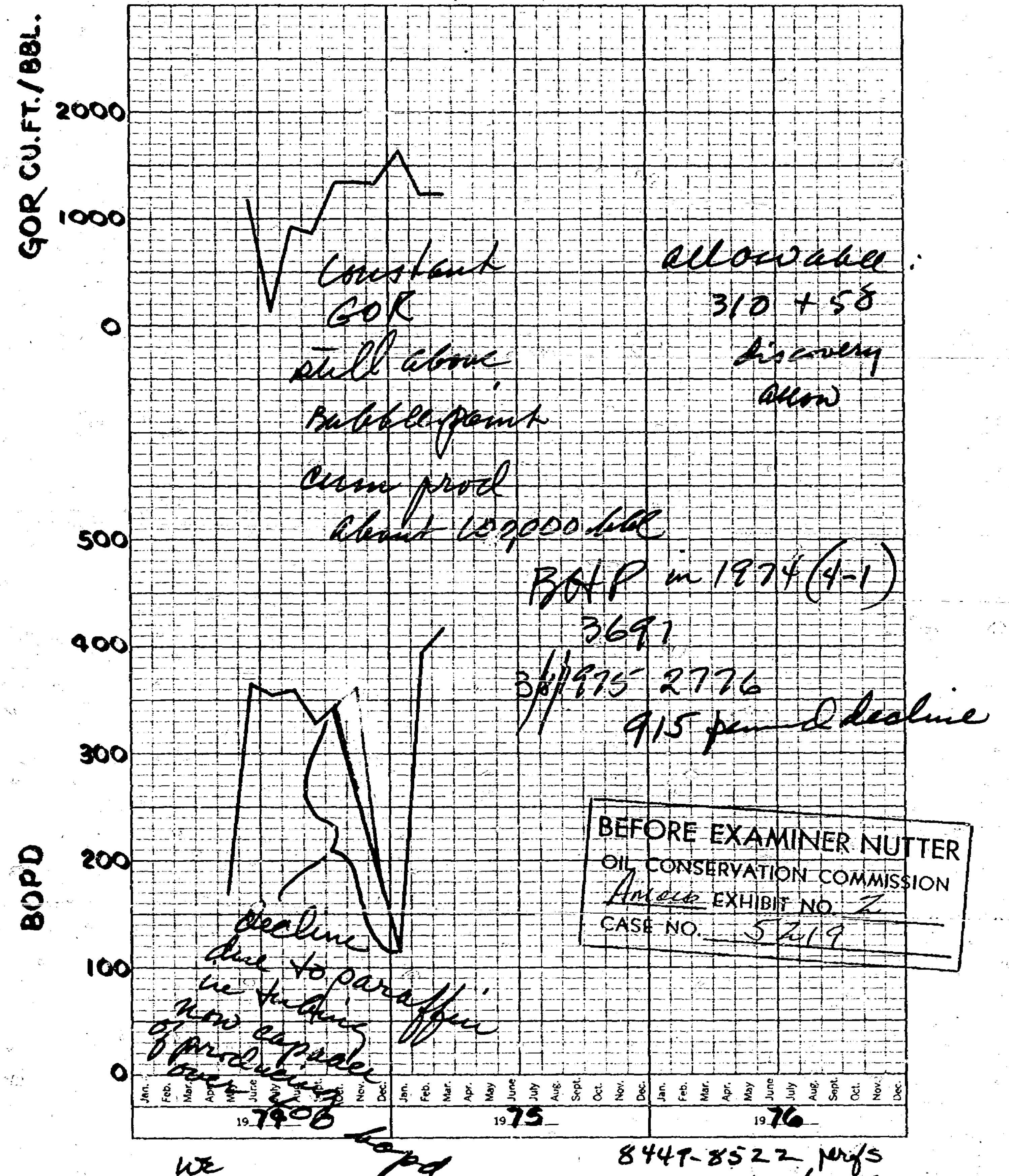
Bill Patterson
Engineer
Production Department

BP:mms

cc: Mr. Frank L. Schatz
Midwest Oil Corporation
1500 Wilco Street
Midland, TX 79701

N. W. Krouskop
R. Crow
File (3) C-1, PLW-1, S-1

EMPIRE SOUTH DEEP UNIT NO. 4
EMPIRE WOLFCAMP, SOUTH POOL



8447-8522 perfs
303 BO owtr 1380 GOR
41° crude

Exhibit 5

WELL COMPLETION DATA SHEET

Midwest Oil Corporation #4 South Empire Deep Unit

South Empire Deep Unit (Wolfcamp) Field

Eddy County, New Mexico

1. Location: 1980' FNL and 2230' FEL Section 32, T-17-S, R-29-E
2. Elevation: 3598 KB
3. TD: 10,950' PBTD: 8560'
4. Top Wolfcamp: 7567 (-3969)
5. Top Pay: 8449 (-4851)
6. Completion Date: 3-13-74
7. Perforated Interval: 8449 to 8522 w/21 shots (OA)
8. Treatment: A/3,000 gals. (15%)
9. IP 303 BOPD + 414 MCFG
   10/64" ch
   1510 FTP
   Pkr. FCP
   1380 GOR
   46.5 Gravity API
10. Net Pay: 31'
11. Average Porosity: 4%
12. Average Permeability: 43 md
13. Average Water Saturation: 30%
14. Reservoir Temperature: 155°
15. Initial Reservoir Pressure: 3730#

80 acre allow
310 BOPD
58
368

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 5
CASE NO. 5219

EXHIBIT _____

PRESSURE DATA ANALYSIS

MIDWEST OIL COMPANY

SOUTH EMPIRE DEEP UNIT #4

By

E. R. Brownscombe

SONICS INTERNATIONAL, INC.
Dallas, Texas

PRESSURE DATA ANALYSIS

Midwest Oil Company

South Empire Deep Unit #4

SUMMARY

Breaks in the build up and drawdown curves suggest that there is a fault or other barrier about 400 - 600 feet from the well. The rate of pressure fall off toward the end of the drawdown test suggests that there are more than 250 productive acres. Permeability is about 40 m.d., the initial reservoir pressure, 3720 psig at 8485. There is improved permeability near the well, but at high rates of flow there is an indication of local blockage by solution gas.

DISCUSSION

Introduction

Two buildup curves and a drawdown curve were analyzed. The pressures and production history are given in Table I.

Reservoir characteristics are given in Table II.

Table III summarizes the rates of flow (bbls/day) and length (hours) corresponding to the cleanup production, the first buildup, the pressure drawdown and the second buildup. The first period is assumed to flow at the 387 B/D (average of last nine days) for the whole period, the time being that required for the actual production during the period. This simplifies the analysis and gives essentially the same result as would be obtained if the exact production history were used for the first period.

Frick refers to the "Petroleum Production Handbook" edited by T. C. Frick;

M & R refers to Mathews & Russell "Pressure Buildup and Flow Tests in Wells"

EVIDENCE OF A BARRIER

The break in the drawdown curve (Fig. III) indicates the presence of a barrier near the well. The drawdown had been planned for 50 hours, but failure of surface equipment terminated it at 24 hours. The rise of the last two points on the drawdown curve above the trend is not explainable on the basis of reservoir characteristics - it undoubtedly reflects changes in operating conditions - they have been disregarded in the analysis. If we had a small reservoir so that the later points represented the "semi-steady state" regime, they would also fall below the early trend. However, in this case the later points would plot as a straight line on a linear plot, and would ~~leave~~ have a strong downward curvature on this plot. Further, the time at which this break occurs is much shorter than corresponds to the size of the reservoir on the basis of an assumed semi-steady state for the late points. This confirms the barrier interpretation.

The presence of a barrier should also be reflected in the build up curves. Unfortunately, the second build up curve is too short to confirm the break, and the first build up curve shows an erratic behavior beginning at about 25 hours. The pressure beginning at this time remained constant for the next 48 hours and then rapidly rose 35 psi. Such behavior is not reasonable reservoir performance, even with two pays open to the well. It seems likely that this was a reflection of further surface equipment problems. For example, a leak at the surface might cause the liquid level to rise with a constant bottom hole pressure. This would cause the well compressibility to decrease markedly, causing the

bottom hole pressure to rise rapidly to the ambient reservoir pressure when the leak stopped.

On the basis of this hypothesis, the first build up curve becomes consistent with the drawdown curve. Further the P* of 3730 for this interpretation (dashed line, Fig. 1) is also closer to the initial drill stem test of 3779 (datum level?) than extrapolation of the first part of the curve which gives P* = 3678.

The break in this curve is at 14 hours instead of 7 hours as in the drawdown, but in view of the uncertainties of interpretation, this is considered a reasonable agreement.

As indicated above, the second build up (Fig. II) is of too short duration to reflect the barrier. At 20 hours there is a hint the curve may be on the rise, but another 24 hours at least would be required to establish a slope for the later part of the curve.

The distance to the barrier is estimated in Table IX. The drawdown indicates about 450 feet; the build up 600 feet. This is a reasonable check for this type of analysis.

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RESERVOIR PERMEABILITY

The two buildups and the drawdown showed 41, 38 and 50 m.d., averaging 43.

RESERVOIR PRESSURE

Using the dashed line Fig. I to get the best value of P* and assuming 320 productive acres, the average reservoir pressure (initial reservoir pressure) is estimated as 3720.(Table VI). If the reservoir is larger, the pressure will be closer to P* (3730 psig).

WELL DAMAGE

The first build up showed S = -4.4, the drawdown S = +4.1 and the second buildup S = +~~0.5~~ 3.6.

The negative value of the first test suggests that the acidizing caused fractures around the well, leading to an improved permeability near the well. The drawdown was run at a higher rate than the initial cleanup, and probably lead to evolution of solution gas around the well, causing local blockage and a positive value for S. This is consistent with a rise in gas oil ratio from 1820 (Table II) for the cleanup period at 387 B/D to (637 + 656)/685 = 1887 at 685 B/D. Continued production at the higher rate should result in the GOR falling back to 1820 as equilibrium gas saturation around the well is established. The second buildup should check the drawdown value of S. Perhaps S = $(4.1 + \frac{3.6}{\sim 5})/2 = \frac{3.8}{\sim 3}$ would be a better value for 685 B/D.

PRODUCTIVE ACREAGE

If the drawdown had been run long enough to establish a straight line section for pressure vs. time, this would have permitted the most reliable estimate of reserves using the "semi-steady state" analysis. A 50 hour test was planned but was cut short by surface equipment problems. It would also be possible to estimate the reserves from a "late transient" analysis if the latter part of the drawdown had reached this stage. However, the straight line in Fig. III for the later points indicates that we are still in the transient period - the late transient should show a pressure fall off from the trend. Therefore the late transient calculation, Fig. V, giving 108 acres is undoubtedly much too low. Figure VI indicates a gradual curvature of P vs. time which is expected before the "semi-steady state" period is reached. If we use a tangent to the later points with a semi-steady state analysis, we should get a figure which is below the actual reserves. This analysis gives a minimum of 250 acres (Fig. VI).

TABLE 1

Midwest Oil Company
South Empire Deep Unit No. 4

Production and Pressure History

Date	Time (New Mexico)	Barrels	High Pressure (MCF/D)	Low Pressure* (MCF/D)	Mid Perforation Pressure 8485 Ft. (psig)	Elapsed Time Pressure Tests (Hours)
3-7-74		(120)	(311)	(321)		
3-8-74		(93)	(241)	(249)		
3-9-74		0	0	0		
3-10-74		0	0	0		
3-11-74		(162)	(421)	(435)		
3-12-74		215	414	(428)		
3-13-74		285	346	(358)		
3-14-74		255	308	(318)		
3-15-74		132	300	(310)		
3-16-74		110	226	(234)		
3-17-74		175	143	(148)		
3-18-74		382	226	(234)		
3-19-74		360	226	(233)		
3-20-74		387	226	(234)		
3-21-74		390	226	(233)		
3-22-74		388	226	(234)		
3-23-74		383	226	(233)		
3-24-74		395	226	(234)		
3-25-74		386	226	(233)		
3-26-74		380	226	(234)		
3-27-74		389	226	(233)		
3-28-74	08:30	390	226	(234)		
	11:30				3573	-1.
	12:00				3572	-.5
well closed	12:30	70	(63 MCF)	(65 MCF)	3573	0.
	12:36				3607	.1
	12:42				3618	.2
	12:48				3619	.3
	12:54				3620	.4
	13:00				3625	.5
	13:12				3626	.7
	13:30				3628	1.0
	14:00				3630	1.5

*Estimated from High Pressure gas and ratio of Low Pressure gas to High Pressure gas during drawdown flow test.

TABLE I (Continued)

Midwest Oil Company
South Empire Deep Unit No. 4

Production and Pressure History

Date	Time (New Mexico)	Barrels	High Pressure (MCF/D)	Low Pressure* (MCF/D)	Mid Perforation Pressure 8485 Ft. (psig)	Elapsed Time Pressure Tests (Hours)
3-28-74	14:30				3631	2.0
	15:00				3633	2.5
	15:30				3635	3.0
	16:30				3636	4.0
	17:30				3639	5.0
	19:30				3642	7.0
	22:30				3644	10.0
3-29-74	03:30				3648	15.0
	08:30				3653	20.0
	13:30				3655	25.0
	18:30				3655	30.0
3-30-74	04:30				3655	40.0
	14:30				3655	50.0
3-31-74	00:30				3656	60.0
	10:30				3657	70.0
4-1-74	14:15				3690	97.75
well opened	15:00				3691	98.5
	15:00				3518	-.25
	15:18				3552	.05
	15:24				3517	.15
	15:30				3494	.25
	15:42				3411	.45
	16:00		520	633	3402	.75
	17:00		533	646	3389	1.75
	18:00		494	565	3384	2.75
	19:00		571	659	3382	3.75
	20:00		593	646	3380	4.75
	21:00		646	672	3375	5.75
	22:00		646	682	3373	6.75
	23:00		672	691	3370	7.75
	24:00		646	691	3366	8.75
4-2-74	01:00		646	691	3361	9.75
	02:00		672	672	3359	10.75

*Estimated from High Pressure gas and ratio of Low Pressure gas to High Pressure gas during drawdown flow test.

TABLE 1 (Continued)

Midwest Oil Company
South Empire Deep Unit No. 4

Production and Pressure History

Date	Time (New Mexico)	Barrels	High Pressure (MCF/D)	Los Pressure* (MCF/D)	Mid Perforation Pressure 8485 Ft. (psig)	Elapsed Tim Pressure Test (Hours)
4-2-74	03:00		721	691	3361	11.75
	04:00		793	706	3357	12.75
	05:00		746	721	3352	13.75
	06:00		721	721	3350	14.75
	07:00	433	746	682	3349	15.75
	08:00	35	646	672	3347	16.75
	09:00	25	691	672	3345	17.75
	10:00	27	672	672	3343	18.75
	11:00	22	646	672	3342	19.75
	12:00	-	(573)**	593	3340	20.75
	13:00	36	(625)**	646	3339	21.75
	14:00	22	(490)**	506	3338	22.75
	15:00	22	(519)**	536	3356	23.75
well closed	15:00	63	-	-	3356	0.
	15:06				3519	.1
	15:12				3571	.2
	15:18				3583	.3
	15:24				3594	.4
	15:30				3599	.5
	15:42				3608	.7
	16:00				3618	1.0
	16:30				3622	1.5
	17:00				3626	2.0
	17:30				3629	2.5
	18:00				3631	3.0
	18:30				3633	3.5
	19:00				3636	4.0
	20:00				3640	5.0
	21:00				3643	6.0
	22:00				3645	7.0
4-3-74	01:00				3649	10.0
	06:00				3654	15.0
bomb out	10:00				3659	19.0

*Estimated from High Pressure gas and rato of Low Pressure gas to High Pressure gas during drawdown flow test.

**Leak developed in High Pressure system, volume estimated from Low Pressure data.

TABLE II

Reservoir Characteristics

Depth: 8485 Feet

Temperature: 155°F

Pay Thickness: 22 Feet Upper, 9 Feet Lower = 31 Feet

Porosity: (.045 x 22 + .031 x 9) /31 = .0409

Oil Gravity: 46.5°API

GOR: (Table I, 3/07 to 3/28) = (5259 + (5435))/5847 = 1820

Formation Volume Factor: (Frick 5-29) = 1.9

Viscosity of Reservoir Oil:

Frick 19-39	46.5°API @ 155°F	= 1.1 cp.
Frick 19-40	1.1 cp @ 1800 GOR	.23 cp.

Compressibility (Frick p. 37-1)

Rock	$8. \times 10^{-6}$	
Oil (70% pore saturation)	$.7 \times 25 \times .10^{-6}$	$= 17.5 \times 10^{-6}$
Connate Water	$.3 \times 3 \times 10^{-6}$	$= .9 \times 10^{-6}$
Overall		2.6×10^{-5}/psi

(.7 is assumed oil saturation; .3, connate water)

TABLE III

Rates and Times

From Hours	To Hours	Rate	Bbls/Day
0	362.6	387	Well Clean Up
362.6	461.4*	0	First Build Up Test
461.4	485.1	685	Drawdown Test
485.1	504.1	0	Second Build Up Test

*15 minutes was added to build up time from flow time to account for adjustments in establishing rates during first half hour.

Length of first period was that necessary to produce total oil as rate of last 9 days, since later production has most effect on build up.

Oil Produced = 5847 barrels, average rate last 9 days = 387 barrels/day

5847/387 x 24 = 362.6

TABLE IV

First Build Up Test
t = 362.6

Δt	$\frac{t + \Delta t}{\Delta t}$	PSIG
	-	3573 Flowing Pressure
0	3627	3607
.1	1814	3618
.2	1210	3619
.3	907.5	3620
.4	762.2	3625
.5	519.0	3626
.7	363.6	3628
1.0	242.7	3630
1.5	182.3	3631
2.0	146.0	3633
2.5	121.9	3635
3.	91.7	3636
4.	73.52	3639
5.	52.80	3642
7.	37.26	3644
10.	25.17	3648
15.	19.13	3653
20.	15.50	3655
25.	13.09	3655
30.	10.07	3655
40.	8.25	3655
50.	7.04	3656
60.	6.18	3657
70.	4.71	3690
97.75	4.68	3691
98.5		

TABLE V

Second Build Up Test

Flow rates in Table III will be matched if we take following flows for times given.

Δt is the time of the second shut in

From	To	Rate
0	$485.1 + \Delta t$	387
362.6	$485.1 + \Delta t$	- 387
461.4	$485.1 + \Delta t$	685
485.1	$485.1 + \Delta t$	- 685

At time $485.1 + \Delta t$ the summation of all four of these production periods will give:

$$Pwf = Pi - 162.6 \times \frac{.23 \times 1.9}{kh} \left[387 \log \frac{485.1 + \Delta t}{485.1 - 362.6 + \Delta t} + 685 \log \frac{485.1 - 461.4 + \Delta t}{485.1 - 485.1 + \Delta t}\right]$$

$$= Pi - 71.05/kh \left[387 \log \frac{485.1 + \Delta t}{122.5 + \Delta t} + 685 \log \frac{23.7 + \Delta t}{\Delta t}\right]$$

This shows how the build up is affected not only by the drawdown test, but also by the earlier production which will also have an appreciable effect.

$$\Sigma = 387 \log \frac{485.1 + \Delta t}{122.5 + \Delta t} + 685 \log \frac{23.7 + \Delta t}{\Delta t}$$

See M & R Eq. 6.5 to 6.7

TABLE V (Continued)

Δt	Σ	Mid Perforation Pressure (psig)
0	-	3338
.1	1859	3519
.2	1654	3571
.3	1535	3583
.4	1450	3594
.5	1385	3599
.7	1287	3608
1.0	1184	3618
1.5	1069	3622
2.0	989	3626
2.5	928	3629
3.0	879	3631
3.5	838	3633
4.0	803	3636
5.0	746	3640
6.0	701	3643
7.0	664	3645
10.0	583	3649
15.0	499	3654
19.0	454	3659

TABLE VI

Average Reservoir Pressure

If the reservoir were infinite, the average pressure would be P*. Let us assume the reservoir has 320 acres and calculate the average pressure $\overline{P}$ from the dashed line extrapolation of the first build up curve. In view of the evidence that we are near the side of the reservoir, we will use M & R Fig. 4.6 curve II to estimate average pressure.

A	=	$320 \times 43560 = 13.94 \times 10^6$ sq. ft.			
k	=	41.3 m.d.	t	=	362.6 hrs.
h	=	31 feet	q	=	387 B/D
ϕ	=	.0409	u	=	.23 cp
C	=	2.6×10^{-5}/psi	B	=	1.9 Reservoir Barrels/Stk Barrels
P*	=	3730			

From M & R, Fig. 4.6, the dimensionless time (abscissa) is:

$$\frac{.000264 \times 41.3 \times 362.6}{.0409 \times .23 \times 2.6 \times 10^{-5} \times 13.94 \times 10^6} = 1.1596$$

The corresponding dimensionless pressure (ordinate, curve II) is:

$$1.1 = \frac{P^* - \overline{P}}{70.6 \times 387 \times .23 \times 1.9/41.3/31}$$

$$P^* - \overline{P} = 10$$

$$\overline{P} = 3730 - 10 = 3720$$

TABLE VII

Drawdown Test

From	To	Rate of Flow
0	461.4 $+\Delta t$	387
362.6	461.4 $+\Delta t$	-387
461.4	461.4 $+\Delta t$	685

$$Pwf = Pi - 162.6 \frac{.23 \times 1.9}{kh} \left[387 \log_{10} \frac{461.4 + \Delta t}{98.8 + \Delta t} + 685 \log_{10} \Delta t \right]$$

$$\Sigma = 387 \log_{10} \frac{461.4 + \Delta t}{98.8 + \Delta t} + 685 \log_{10} \Delta t$$

Δt	Σ	P	
0	-	3667	(see Table VI)
.05	-632	3552	
.15	-305	3517	
.25	-154	3494	
.45	.21	3411	
.75	172	3402	
1.75	423	3389	
2.75	556	3384	
3.75	647	3382	
4.75	716	3380	
5.75	772	3375	
6.75	818	3373	
7.75	858	3370	
8.75	893	3366	
9.75	924	3361	
10.75	952	3359	
11.75	977	3361	
12.75	1000	3357	
13.75	1022	3352	
14.75	1041	3350	
15.75	1060	3349	
16.75	1077	3347	
17.75	1093	3345	
18.75	1108	3343	
19.75	1123	3342	
20.75	1137	3340	
21.75	1149	3339	
22.75	1162	3338	
23.75	1174	3356	

TABLE VIII

Drawdown Test Late Transient Analysis

Hours	PSIG @ 8485	$\hat{P}$ 3330	$\hat{P}$ 3325	$\hat{P}$ 3320	$\hat{P}$ 3310	$\hat{P}$ 3300	$\hat{P}$ 3275
6.75	3373	43	48	53	63	73	98
7.75	3370	40	45	50	60	70	95
8.75	3366	36	41	46	56	66	91
9.75	3361	31	36	41	51	61	86
10.75	3359	29	34	39	49	59	84
11.75	3361	31	36	41	51	61	86
12.75	3357	27	32	37	47	57	82
13.75	3352	22	27	32	42	52	77
14.75	3350	20	25	30	40	50	75
15.75	3349	19	24	29	39	49	74
16.75	3347	17	22	27	37	47	72
17.75	3345	15	20	25	35	45	70
18.75	3343	13	18	23	33	43	68
19.75	3342	12	17	22	32	42	67
20.75	3340	10	15	20	30	40	65
21.75	3339	9	14	19	29	39	64
22.75	3338	8	13	18	28	38	63
23.75	3356	-	-	-	-	-	-

TABLE IX

Distance to Barrier (M & R 10.6, 10.7)

From Drawdown Test (Figure III)

$$t_x = 7.0 \text{ hours}$$

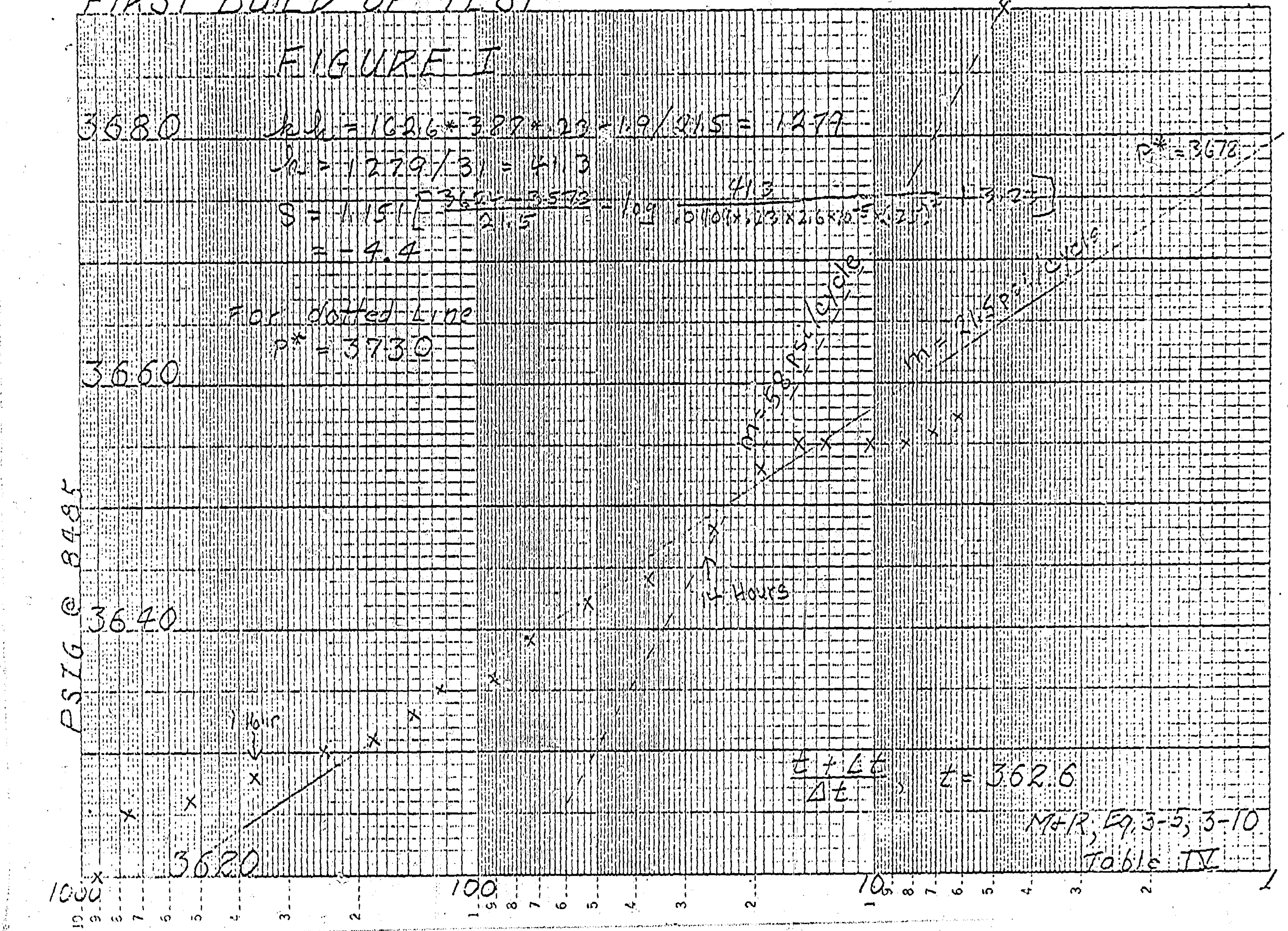
$$d = \sqrt{\frac{.000264 \times 50 \times 7.0}{1.78 \times .0409 \times .23 \times 2.6 \times 10^{-5}}} = 461$$

From first Build Up Test (Figure I)

$$t_x = 14 \text{ hours}$$

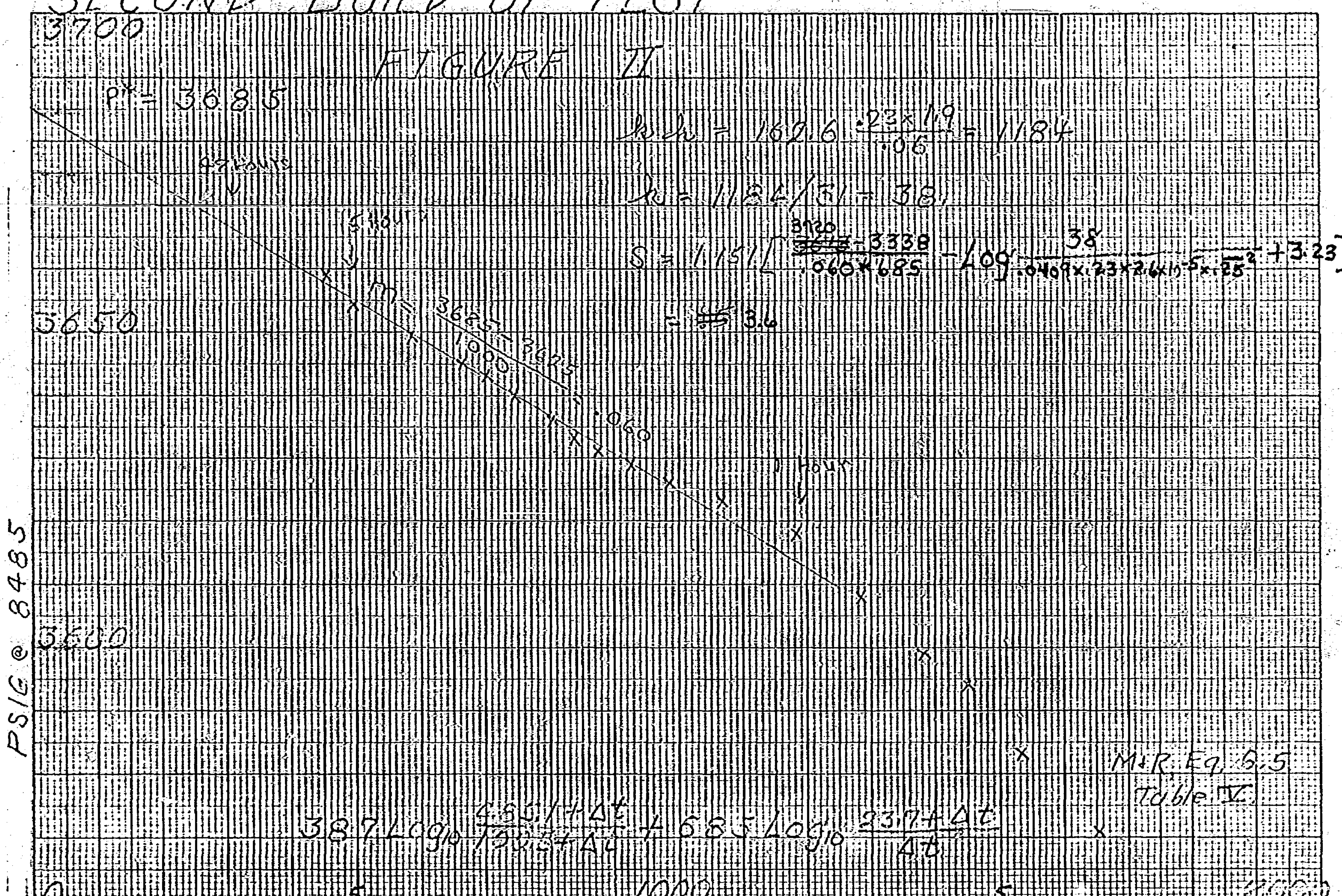
$$d = \sqrt{\frac{.000264 \times 41.3 \times 14}{1.78 \times .0409 \times .23 \times 2.6 \times 10^{-5}}} = 592$$

FIRST BUILD UP TEST

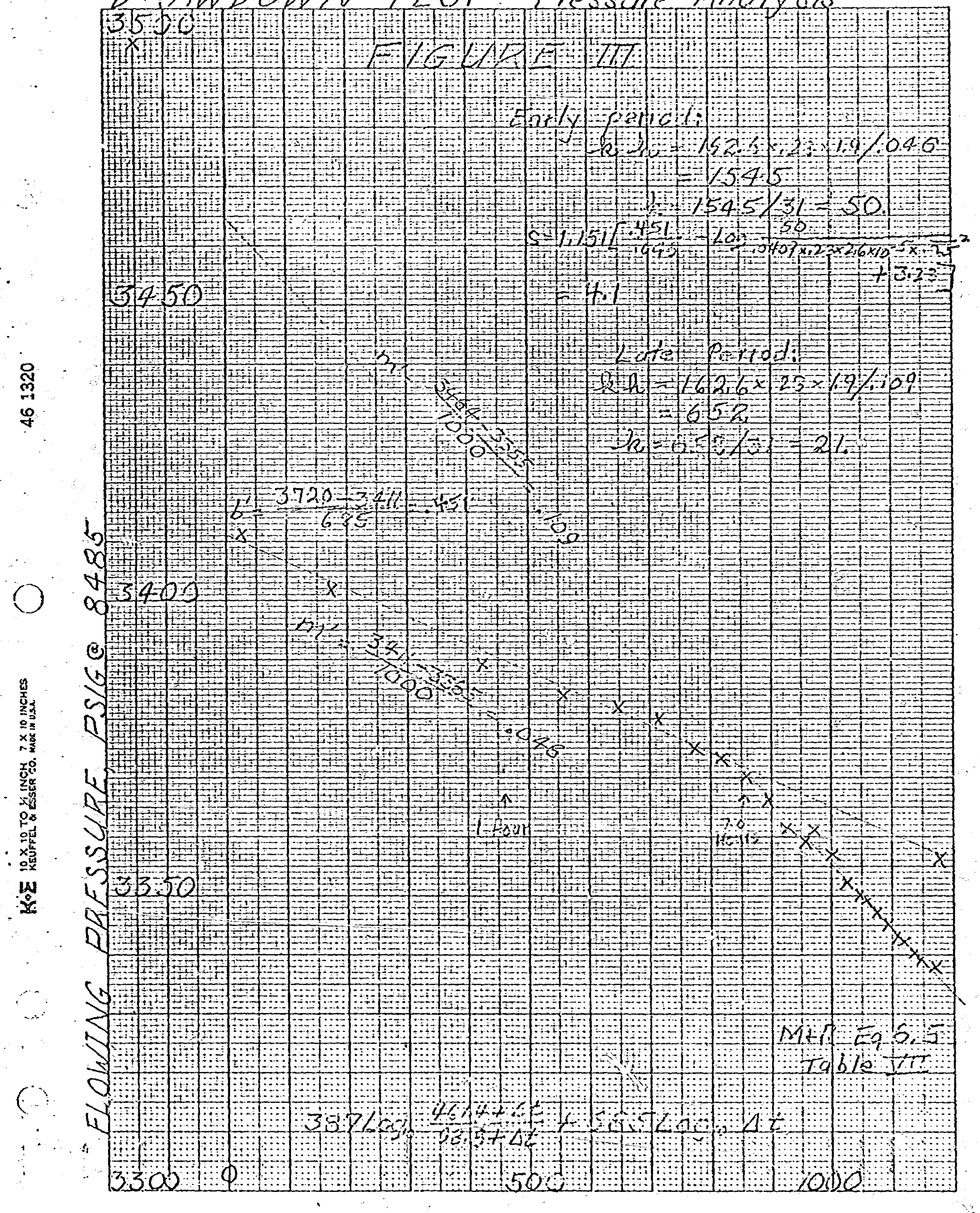


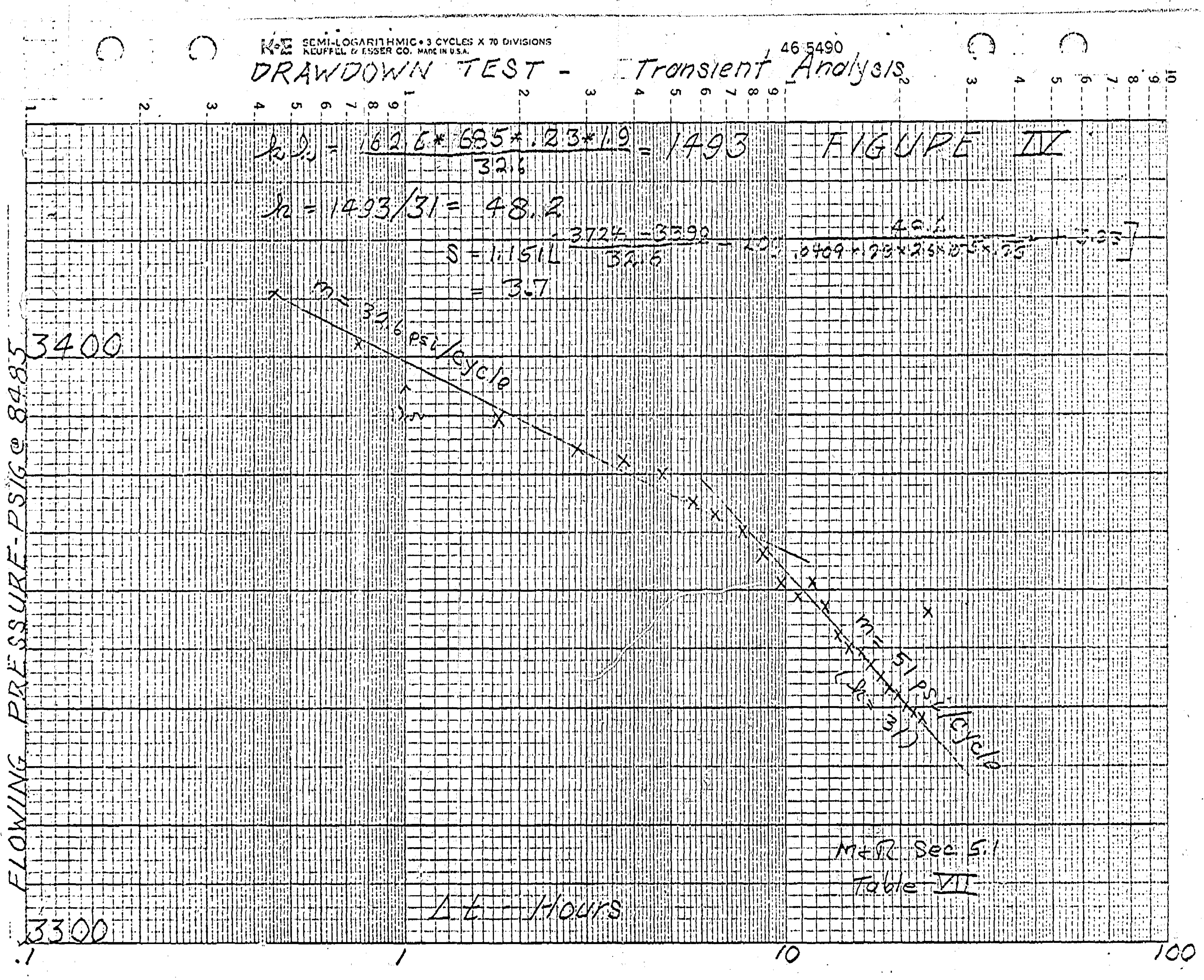
K&E 10 X 10 TO ½ INCH 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A. 46 1320

SECOND BUILD UP TEST



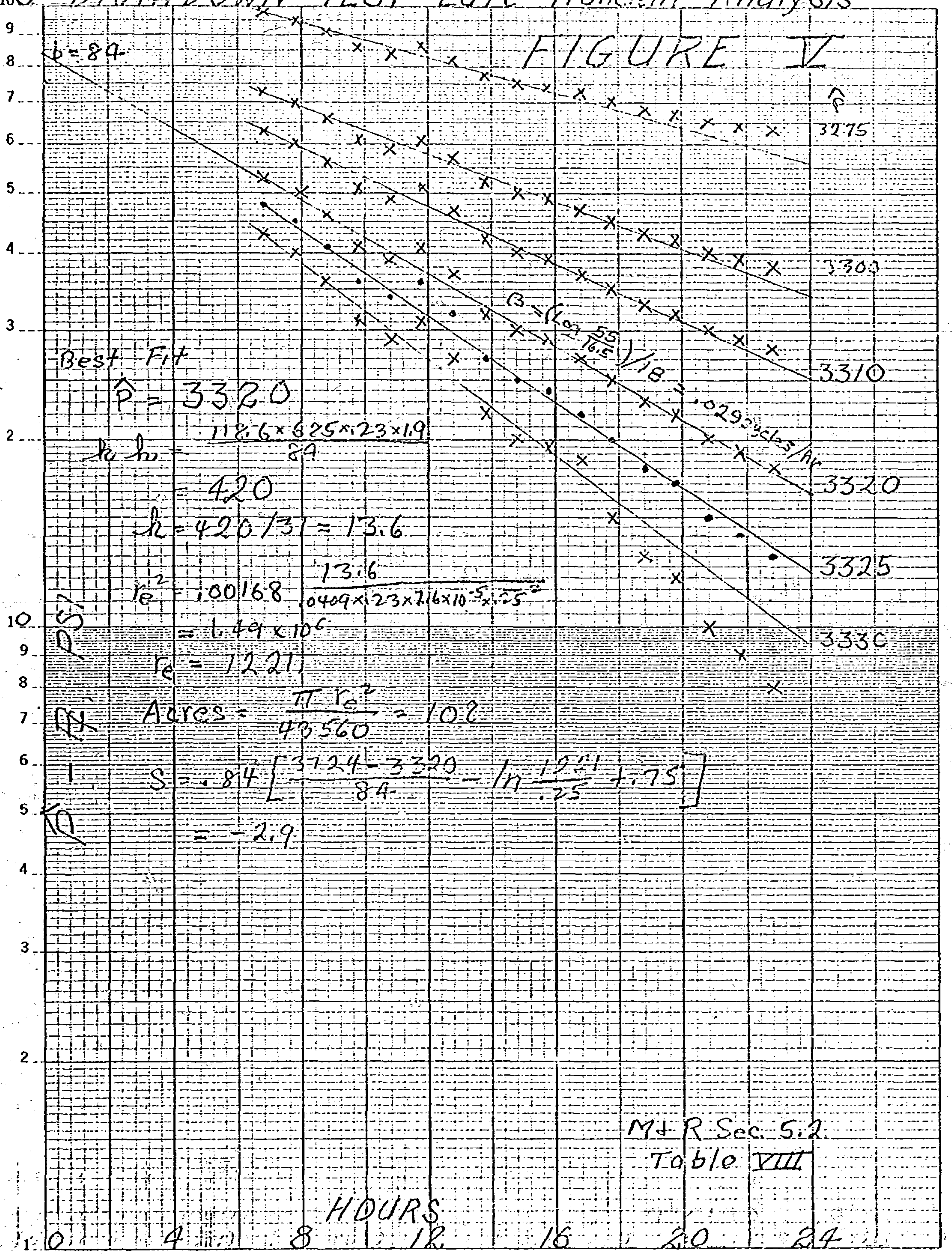
DRAWDOWN TEST - Pressure Analysis



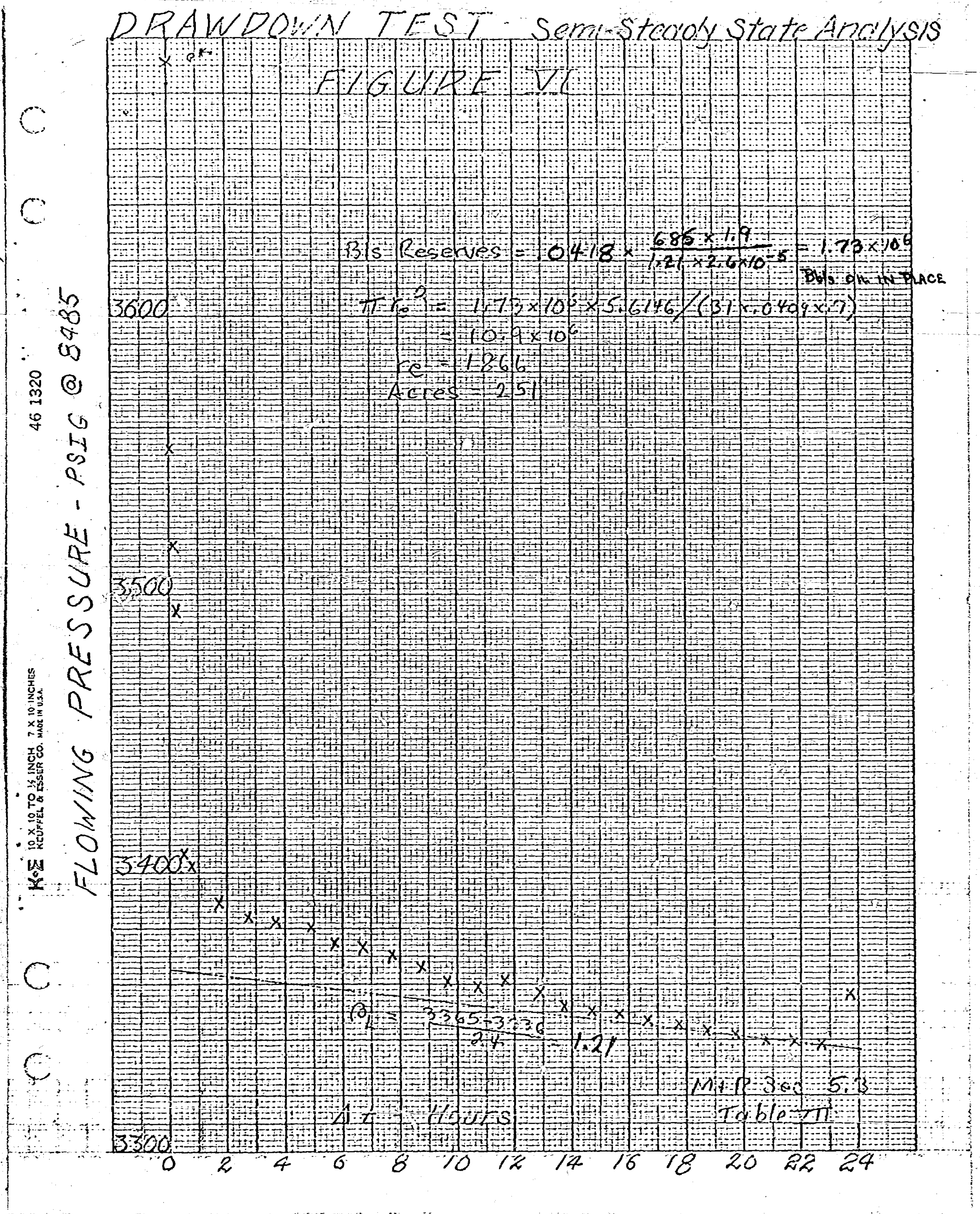


K+E SEMI-LOGARITHMIC • 3 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 5490
DRAWDOWN TEST - Transient Analysis
FIGURE IV
kh = 162.6 * 685 * .23 * 1.9 / 32.6 = 1493
k = 1493/31 = 48.2
S = 1.151 [(3724 - 3390) / 32.6
= 3.7
m = 32.6 psi/cycle
m = 51 psi/cycle
(k = 31)
FLOWING PRESSURE-PSIG @ 8485
3400
3300
Δt - Hours
.1
1
10
100
M+R Sec 5.1
Table VII

DRAWDOWN TEST - Late Transient Analysis



SEMI-LOGARITHMIC • 2 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 4970


DRAWDOWN TEST - Semi-Steady State Analysis
FIGURE VI
Bls Reserves = .0418 × 686 × 1.9 / 1.21 × 2.6×10-5 = 1.73×106
Bbls Oil in Place
πre2 = 1.73×106 × 5.6146 / (31 × .0409 × .7)
= 10.9×106
re = 1866
Acres = 251
β1 = 3365-3336 / 24 = 1.21
MTR Sec 5.3
Table III
FLOWING PRESSURE - PSIG @ 8485
3600
3500
3400
3300
0
2
4
6
8
10
12
14
16
18
20
22
24
Δt - Hours
K&E 10 X 10 TO ½ INCH 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.
46 1320

ECONOMICS OF DRILLING, COMPLETION AND OPERATING COSTS
South Empire Deep Unit (Wolfcamp)
Eddy Co., New Mexico

1.	Drilling & Completion Costs	$295,000/well
2.	Oil Price	$11.10/Bbl.
3.	Gas Price	$.23/mcf
4.	GOR	1820 cf/Bbl.
5.	Taxes (Severence, Ad Valorum, etc.)	6.5%
6.	Revenue Interest	87.5% ~~(min.)~~ MAX
7.	Operating Cost/Bbl.	$.05/Bbl. (min.)
8.	Revenue/Bbl.	$9.38
9.	Barrels Oil to Payout	31,450
10.	Profit to Investment Ratio	

$$\frac{\text{Revenue/Bbl. x Reserves x Risk}}{\text{Well Cost}}$$

For 80 Ac. = 3.29

For 40 Ac. = 1.64

Reserves @ 138,000 BBLS per ~~160~~ 80 acres

Assume 75% risk factor

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
EXHIBIT NO. 7
CASE NO. 5219

Ph: 684-6635
B.11 Thoren

MIDWEST OIL CORPORATION

1500 WILCO BUILDING
MIDLAND, TEXAS 79701

RECEIVED
MAR 2
OIL CONSERVATION COMM
Santa Fe

March 26, 1974

Case 5219

New Mexico Oil Conservation Commission
State Land Office Building
Santa Fe, New Mexico 87501

Gentlemen:

Midwest Oil Corporation, 1500 Wilco Building, Midland, Texas 79701, hereby respectfully applies for an Examiner's Hearing on April 24, 1974, seeking approval for discovery oil allowable and temporary field rules for its #4 South Empire Deep Unit Wolfcamp well located in Unit G, Section 32, T-17-S, R-29-E, Eddy County, New Mexico.

Very truly yours,

MIDWEST OIL CORPORATION

F. L. Schatz

F. L. Schatz
District Exploration Manager

FLS:nra

DOCKET MAILED

Date 4-16-75
for 1975

DOCKET MAILED

Date 4-11-74

DRAFT

jr/

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

records center

CASE NO. 5219

Order No. R- 4784

NOMENCLATURE

APPLICATION OF MIDWEST OIL
CORPORATION FOR POOL CREATION,
DISCOVERY ALLOWABLE, AND SPECIAL
POOL RULES, EDDY COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on April 25, 1974, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this _____ day of May, 1974, 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 a new pool for production of oil from the Wolfcamp formation, Eddy County, New Mexico, and for promulgation of special rules and regulations for ~~the South Empire-Wolfcamp~~ said Pool, ~~Eddy County, New Mexico,~~ including a provision for 80-acre proration units.

(3) That the applicant also seeks the assignment of an oil discovery allowable in the amount of approximately 42,245 barrels to the discovery well for said pool.

(4) That the evidence presently available indicates that the Midwest Oil Corporation South Empire Deep Unit Well No. 4, located in Unit G of Section 32, Township 17 South, Range 29 East, NMPM, Eddy County, New Mexico, has discovered a separate common source of supply which should be designated the South Empire-Wolfcamp Pool; that the vertical limits of said pool should be defined as the Wolfcamp formation, and that the horizontal limits of said pool should be defined as the NE/4 of said Section 32.

(5) That the subject discovery well for the aforesaid pool is entitled to and should receive a bonus discovery oil allowable in the amount of 42,245 barrels, based upon the top of the perforations in said well at 8,449 feet, to be assigned over a two-year period.

(6) 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 80-acre spacing units should be promulgated for the South Empire-Wolfcamp Pool.

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

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

(9) That this case should be reopened at an examiner hearing in ~~April~~ May, 1975, at which time the operators in the subject pool should be prepared to appear and show cause why the South Empire-Wolfcamp Pool should not be developed on 40-acre spacing units.

IT IS THEREFORE ORDERED:

(1) That a new pool for the production of oil from the Wolfcamp formation is hereby established and designated the South Empire-Wolfcamp Pool.

(2) That the vertical limits of said pool are the Wolfcamp formation and the horizontal limits are the NE/4 of Section 32, Township 17 South, Range 29 East, NMPM, Eddy County, New Mexico.

(3) That the Midwest Oil Corporation South Empire Deep Unit Well No. 4 located in Unit G of Section 32, Township 17 South, Range 29 East, South Empire-Wolfcamp Pool, Eddy County, New Mexico, is hereby authorized an oil discovery allowable of 42,245 barrels to be assigned to said well at the rate of 58 barrels per day in accordance with Rule 509 of the Commission Rules and Regulations.

(4) That temporary Special Rules and Regulations for the South Empire-Wolfcamp Pool, Eddy County, New Mexico, are hereby promulgated as follows:

SPECIAL RULES AND REGULATIONS
FOR THE
SOUTH EMPIRE-WOLFCAMP POOL

RULE 1. Each well completed or recompleted in the South Empire-Wolfcamp Pool or in the Wolfcamp formation within one mile thereof, and not nearer to or within the limits of another designated

Wolfcamp 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 80 acres, more or less, consisting of the N/2, S/2, E/2, or W/2 of a governmental quarter section; provided however, that nothing contained herein shall be construed as prohibiting the drilling of a well on each of the quarter-quarter sections in the unit.

RULE 3. The Secretary-Director of the Commission may grant an exception to the requirements of Rule 2 without notice and hearing when an application has been filed for a non-standard unit comprising a governmental quarter-quarter section or lot, 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 a governmental quarter-quarter section or lot.

RULE 5. The Secretary-Director may grant an exception to the 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 previ-

ously drilled to another horizon. All operators offsetting the proposed 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 operators offsetting the proposed location or if no objection to the unorthodox location has been entered within 20 days after the Secretary-Director has received the application.

RULE 6. A standard proration unit (79 through 81 acres) shall be assigned ~~an 80-acre proportional factor of 6.67 for allowable purposes~~ a depth bracket allowable of 310 barrels of oil per day, subject to the market demand percentage factor, and in the event there is more than one well on an 80-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 80 acres.

IT IS FURTHER ORDERED:

(1) That the locations of all wells presently drilling to or completed in the South Empire-Wolfcamp Pool or in the Wolfcamp formation within one mile thereof are hereby approved; that the operator of any well having an unorthodox location shall notify the Artesia District Office of the Commission in writing of the name and location of the well on or before July 1, 1974.

(2) That, pursuant to Paragraph A. of Section 65-3-14.5, NMSA 1953, contained in Chapter 271, Laws of 1969, existing wells in the South Empire-Wolfcamp Pool shall have dedicated thereto 80 acres in accordance with the foregoing pool rules; or, pursuant to Paragraph C. of said Section 65-3-14.5, existing wells may have

non-standard spacing or proration units established by the Commission and dedicated thereto.

Failure to file new Forms C-102 with the Commission dedicating 80 acres to a well or to obtain a non-standard unit approved by the Commission within 60 days from the date of this order shall subject the well to cancellation of allowable. Until said Form C-102 has been filed or until a non-standard unit has been approved, and subject to said 60-day limitation, each well presently drilling to or completed in the South Empire-Wolfcamp Pool or in the Wolfcamp formation within one mile thereof shall receive no more than one-half of a standard allowable for the pool.

(3) That this case shall be reopened at an examiner hearing in ~~April~~ May, 1975, at which time the operators in the subject pool may appear and show cause why the South Empire-Wolfcamp 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 herein-above designated.

dr/

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 5219

Order No. R-4784-A

IN THE MATTER OF CASE NO. 5219 BEING
REOPENED PURSUANT TO THE PROVISIONS OF
ORDER NO. R-4784, WHICH ORDER ESTABLISHED
TEMPORARY SPECIAL POOL RULES FOR THE SOUTH
EMPIRE-WOLFCAMP POOL, EDDY COUNTY, NEW MEXICO,
INCLUDING A PROVISION FOR 80-ACRE SPACING.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on April 16 75, 19
at Santa Fe, New Mexico, before Examiner Daniel S. Nutter

NOW, on this _____ day of ~~April~~ May, 195_, 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-4784, dated May 21, 1974, temporary special rules and regulations were promulgated for the South Empire-Wolfcamp Pool, Eddy County, New Mexico, establishing temporary 80-acre spacing units.

(3) That pursuant to the provisions of Order No. R-4784, this case was reopened to allow the operators in the subject pool to appear and show cause why the South Empire-Wolfcamp Pool should not be developed on 40-acre spacing units.

(4) That the evidence establishes that one well in the South Empire-Wolfcamp Pool can efficiently and economically drain and develop 80 acres.

(5) That the Special Rules and Regulations promulgated by Order No. R-4784 have afforded and will afford to the owner of each property in the pool the opportunity to produce his just and equitable share of the ~~gas~~ oil in the pool.

(6) 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-4784 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 South Empire-Wolfcamp Pool, Eddy County, New Mexico, promulgated by Order No. R-4784, 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.