CASE 6067: TEXAS PACIFIC OIL CO., INC.
FOR POOL CONTRACTION AND EXTENSION,
EDDY COUNTY, NEW MEXICO

Case Number

6067 - (6067)

Application

Transcripts.

Small Exhibits

ETC.

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
12 October, 1977

EXAMINER HEARING

IN THE MATTER OF:

Application of Texas Pacific Oil Co., Inc., for pool contraction and extension, Eddy County, New Mexico.

CASE 6067

BEFORE: Daniel S. Nutter.

TRANSCRIPT OF HEARING

A P P E A R A N C E S

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

For the Applicant: Michael B. Campbell, Esq.
CAMPBELL, BINGAMAN & BLACK
Santa Fe, New Mexico 87501

For Belco Petroleum Corp.: W. Thomas Kellahin, Esq.
KELLAHIN & FOX
500 Don Gaspar
Santa Fe, New Mexico 87501

I N D E X

E X H I B I T S

MR. NUTTER: Call now Case 6067.

MS. TESCHENDORF: Case 6067. Application of Texas Pacific Oil Company, Inc., for pool contraction and extension, Eddy County, New Mexico.

MR. NUTTER: I'll call for appearances in this case.

MR. CAMPBELL: On behalf of the applicant, Texas Pacific Oil Company, Mike Campbell, with Campbell, Bingaman and Black, in Santa Fe.

MR. KELLAHIN: I'm Tom Kellahin of Kellahin and Fox, Santa Fe, New Mexico, appearing on behalf of Belco Petroleum Corporation.

MR. NUTTER: Mr. Campbell, would you proceed, sir.

MR. CAMPBELL: Yes, sir.

MR. NUTTER: Would all witnesses stand and be sworn, please?

(Witnesses sworn.)

REGINALD C. KEYES

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. CAMPBELL:

Q. Would you please state your name and occupation?

A. My name is Reginald Keyes, spelled K-E-Y-E-S. I'm senior geologist with Texas Pacific Oil Company in Midland, Texas.

Q. And have you appeared before this Commission before and been properly qualified?

A. Yes, I appeared before the Commission two weeks ago in a forced pool hearing, Case Number 6046.

Q. Would please state what the application of Texas Pacific seeks to accomplish today?

A. We are attempting to remove Section 3, Township 22 South, Range 25 East, from the Catclaw Field, respace it to 320 acres, so that it would become a part of the Revelation Field.

MR. CAMPBELL: Mr. Examiner, I might inquire briefly here, we are presenting the same -- of we hope to present the same four exhibits that we presented in the previous case, review them in the same manner. If you would like us to proceed in that manner or if you would like us to be not repetitive or attempt to cover ground that's already been put in issue, we will do it either way you like.

MR. NUTTER: The hearing September 28th a good deal of material was presented which is probably applicable to this case today. I would suggest in the absence of objections on either side, that the record in Case Number 6046 and the record in Case Number 6067 be consolidated.

Is there objection to that consolidation?

MR. KELLAHIN: No objection.

MR. NUTTER: Do you have any objection?

MR. CAMPBELL: We have no objection, Mr. Examiner. We do have two additional exhibits to -- to submit today. In addition to the exhibits, the testimony that was offered by Mr. Keyes in the previous case is basically the testimony that he will offer today. He is available for cross examination. We will review his testimony offered in the previous case today, if the Examiner desires; if the Examiner and the intervening party believe it necessary to review it, then we will; otherwise, we would simply incorporate his testimony given in the previous case in the case today.

MR. NUTTER: I don't think there's need for a lot of repetition of some of the testimony. If you feel that certain ground has not been covered adequately you're, of course, welcome to cover any additional ground, or recover such ground.

I think, according to my records, that in the previous case, Number 6046, Belco Petroleum Corporation submitted seven exhibits.

MR. KELLAHIN: I believe that's correct.

MR. NUTTER: And I believe that in the previous case, Number 6046, Texas Pacific submitted five exhibits.

MR. CAMPBELL: That is correct, Mr. Examiner.

MR. NUTTER: You had the four geological exhibits and then the fifth was the --

MR. CAMPBELL: USGS.

MR. NUTTER: -- application for a drilling permit, USGS.

MR. CAMPBELL: Yes, sir.

MR. NUTTER: So we will consolidate the two cases for purpose of hearing. These exhibits are a matter of record. If you want to discuss them in more detail, feel free to do so. Separate orders, of course, will be entered in the two cases.

MR. CAMPBELL: Mr. Examiner, we -- if that is the Examiner's ruling, we would forgo examining Mr. Keyes on the geologic aspects of our application, which I believe was sufficiently reviewed in the previous case.

We have two additional exhibits to be presented by another witness on the draining ability in the area and testimony regarding the ability to drain in Section 3. We will be as brief as possible with that testimony and we will proceed to that immediately.

MR. NUTTER: Well, I think, now, we've had Mr. Keyes sworn, he's on the stand, you've had an opportunity to redirect, and you've chosen not to do so. If the opposition would care to cross examine him.

MR. KELLAHIN: Yes, Mr. Nutter, there are a few

questions I'd like to ask Mr. Keyes that may be repetitive of what we asked him a couple of weeks ago, but I'm still not clear on a few things.

MR. NUTTER: Go ahead.

CROSS EXAMINATION

BY MR. KELLAHIN:

Q. I'd like to refer you, Mr. Keyes, to what has been introduced as Exhibit Number 1, that's the --

MR. CAMPBELL: Is that TP Number 1?

MR. KELLAHIN: Yes, that's the structure --

MR. CAMPBELL: Morrow structure.

Q. (Mr. Kellahin continuing.) If I remember your testimony correctly, Mr. Keyes, you testified in summary with regards to Exhibit Number 1, that structural considerations for this area was in fact very important.

A. Yes.

Q. That in addition to the structure information on Exhibit 1 you prepared the Isopacs of the Upper and Lower Morrow.

A. Right.

Q. And then I believe there was a cross section. In determining potential Morrow production would you, as an expert geologist, rely solely on, or primarily on the structure map to determine where you would find or most likely find the

Morrow production?

A. I would use it as one facet of it. I would also rely on my Isopac maps.

Q. All right, apart from the structure map and the Isopacs, what if any other additional information have you relied upon in determining what you believe to be the geology of Section3?

A. What other information?

Q. Yes, sir.

A. Just what I've presented. This is what we base our case on.

Q. Summarize for me what your testimony was with regards to the significance of your Morrow structure plat.

A. Well, as I stated previously, this was a strong ridge. I used the word "ridge". I changed that to a plunging anticline. At the northeast corner of Section 3 you'll notice that there is a reversal. In other words, the thing is coming down and then it changes and it goes up toward the Catclaw.

Q. Yes, sir, I know.

A. This is interpreted as a syncline. This, in essence, separates Catclaw from Revelation.

Q. Why do you believe the reversal as you've drawn it occurs at that point?

A. Based on the subsea points that I have. Also if you map on a deeper horizon, Devonian, you will see that such

a syncline exists on a deeper bed. We are looking at a reflection of those beds.

MR. NUTTER: Mr. Keyes, are we really talking about a syncline or are we talking about a saddle in between the two highs?

A. Well, a saddle, but it's -- it bottoms out there and I prefer the word "syncline" to saddle.

Q. You've stated this is simply a matter of interpretation. You would agree with me, would you not, Mr. Keyes, that we have no control at this point to know for sure that the reversal, in fact, occurs as you've indicated?

A. The reversal does occur in deeper beds, Mr. Kellahin.

Q. Based upon the same information contained on this exhibit, is it -- is it not also reasonable to simply remove this reversal?

A. If you so do so by connecting those contour lines, you would have a very short -- a very, very short feature, and I don't think that such a thing exists.

Q. Based upon your structure map, where would you locate your proposed well?

A. We have located, as I stated, 1980 from the south and 990 from the west of Section 3.

Q. 1980 and 990?

A. Yes, sir.

Q. Why have you chosen that particular location?

A. This is a standard 320 proration unit. If you will take your Isopacs values and maps you will see that this would be an optimum location.

Q. Is that proposed location the highest point within Section 3 structurally?

A. No, it is not.

Q. Is it preferable in the Morrow to remain higher in the structure?

A. No, not necessarily. The Morrow is a stratigraphic structural type of entrapment. If you were strictly looking at some entrapment by structural means only, yes, you would seek the highest structural position, structural attitude. Such is not the case.

Q. In fact, the structure mapping for the Morrow is less significant than other factors. You have to take into consideration your Isopacs --

A. And you also take in the Morrow. You cannot take a regional aspect. You don't use the Morrow as a regional structure map. You use it as a local; just in the area that you're interested in.

Q. Well, by way of example, you can look at the Belco Well in Section 16 and that is higher structurally, and that, in fact, that well produced water in the Morrow Sand.

A. It tells you that that sand is not connected to

the other sand because you're producing down dip from that and you're making gas.

Q. Let's go to your Isopacs, Mr. Keyes. I'm specifically interested in Exhibit Number 3, Mr. Keyes, the Isopac on the Lower Morrow.

In regards both to Exhibit 2, which is the Isopac on the Upper Morrow, and Exhibit 3, which is the Isopac on the Lower Morrow, I would appreciate your explanation as to why you've elected to separate the two into different Isopac maps.

A. According -- it's in my previous testimony, I mentioned that there is a shale break that appears in Intervenor Number 4, this cross section, which carries across the area. It was for this reason that we -- that the decision was made. Also, you lose sands in the Lower Morrow more than you do in the Upper Morrow because of the deposition itself of the Morrow at that particular -- in that time spacing.

Q. You're aware, are you not, Mr. Keyes, that the Commission makes no distinctions in their ruling with regards to Morrow Pools between Upper and Lower Morrow?

A. Yes, that's right.

Q. Let me direct your attention to Exhibit Number 3. In specific reference to some of the Isopac values you've used on the net -- net feet of pay in the Lower --

A. Yes.

Q. -- Lower Morrow. In Section Number 4 there's the Belco Petroleum R-V 4 Federal. That well is coded to show that you're referring to this Lower Morrow production in that well.

A. That's right.

Q. Why have you chosen to exclude that from -- from your Isopac contours?

A. Well, at that time there was only one value there. You have an 8-foot value, and well how do you draw a line? How do you draw the zero line or 10-foot line; 10-foot Isopac? It's all conjecture at this point. I could have drawn a zero line and that was all I could have done.

Q. In Section 2 there is the Hannigan Petroleum North Fork Well and you've indicated a zero value in that well, have you not?

A. Correct.

Q. Are you in fact sure that that has a zero value in the Morrow?

A. I am sure according to my parameters.

Q. Is that well in your cross section in Exhibit Number 4?

A. Yes, it is. Yes, it is.

Q. That's the second well from the right?

A. That's correct.

Q. Information indicated below the log shows that this

well flows some 300 MCF of gas per day. Where are the Morrow perforations?

A. If you'll look there are some hatch marks.

Q. Yes, sir, I see those. At what depth are those?

A. Well, I can't -- I've got a larger scale on that; I can't see on the cross section.

Approximately 10,610, 10,611.

Q. From 10,610 or 10,611 to what depth?

A. Well, it's written down there, to 733.

MR. NUTTER: Well, then the perforations aren't -- the hatchers don't cover the --

A. They don't cover. That's a drafting error, it was put up at six. We should drop those last perforations down to the appropriate depth.

Q. And apparently, and you'll have to correct me if I'm wrong, apparently some 122 feet of perforations?

A. No, that's 122 gross interval, but perforations -- these were one shot per foot, is the way these were recorded.

Q. How many feet of net pay for this Morrow interval?

A. I have given it none, because, as I say, it does not fit my parameters; there is not seven percent porosity there.

Q. What were your other parameters? You had seven percent porosity.

A. Water saturations.

Q. What was your water saturation?

A. Fifty percent or less.

Q. Fifty percent or less. And how about permeability?

A. This -- you cannot obtain permeability values, they're too close.

Q. What other values?

A. I also used drillstem test information. If a drillstem test produced water at that interval, it was water bearing. If it was tight, the whole interval was considered to be tight.

MR. KELLAHIN: I have nothing else.

MR. NUTTER: Are there any further questions of the witness? Do you have any redirect?

MR. CAMPBELL: No, Mr. Examiner.

MR. NUTTER: The witness may be excused. Call your next witness.

MR. CAMPBELL: Mr. Examiner, at this point I would like to proceed and hold Mr. Schroeder for possible rebuttal testimony if we feel it's required. At this point we would -- we have evidence on drilling capacity in the area. We don't believe that it's necessary at this point. Should -- should that become an issue on -- on the Intervenor's case, we'll be happy to present this evidence. Otherwise, I think it would be just as wise to withhold it at this time, anyway.

I believe that's how we'd like to proceed. I

don't know what kind of approach the Intervenor's are going to -- I don't want to draw this out any further than I have to.

I think what we'll do is go ahead and present this as briefly as possible and open Mr. Schroeder up to cross examination at this time, then.

MEL SCHROEDER

being called as a witness and being duly sworn upon his oath testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. CAMPBELL:

Q. Would you please state your name and occupation?

A. My name is Melvin L. Schroeder and I'm an engineer with Texas Pacific Oil.

Q. And have you previously testified before this Commission and been properly qualified?

A. Yes, I have.

Q. I will ask you to review what has been marked as Applicant's Exhibit 6 and 7 and explain what those exhibits attempt to illustrate.

MR. NUTTER: Mr. Campbell, we have your exhibits 1 through 5. They're identified as being in Case Number 6046. In order to save going back and re-labeling all these other

exhibits as being joint exhibits in the two cases, I think that this would just be Applicant's Exhibit 1.

MR. CAMPBELL: That will be fine.

MR. NUTTER: In the new case, which is Number 6067. All the rest are in the record; we've consolidated both cases, I won't have to renumber all the exhibits. We'll just have to renumber two.

Q (Mr. Campbell continuing.) Mr. Schroeder, will you examine what has been marked as Applicant's Exhibits 1 and 2 and explain briefly what those exhibits illustrate?

A. Okay. Exhibit Number 1 is a set of computer computer pressure divided by deviation factor. P/z versus Q are your gas production plots for all Catclaw Draw - Morrow gas wells which are or were productive.

On these plots I have extrapolated data points to project an initial gas in place and an initial P/z value for each well.

Q. Is the formula and the data that you have used a standard compilation procedure, standard formula, used in attempting to calculate the drawing ability of a well?

A. Well, I haven't reviewed Number 2, but on Exhibit Number 1 this is a standard method of projecting reserve for gas wells, which is derived from material balance equations.

Exhibit Number 2, I've listed all the wells and the numbers. The numbers out beside the wells correspond to

the numbers in the lower righthand corner of the P/z versus gas production plot, giving the IP from additional information, giving the initial shut-in well pressures reported. These first two columns both come from completion reports and I've included these primarily because in some cases the computer data could not pick up what I believed was the actual initial pressure and for example, Well No. 9, very quickly. This is a well in which based on the computer information, which is derived from tests reported to the Commission, that the initial wellhead shut-in pressure reported here was 2730 on 12-73, whereas the initial completion report projected an initial shut-in wellhead pressure of 3515. And as you can see by looking at the P/z versus Q in plot for Well No. 9, the first two points -- the first point looks erroneously low. There is no way that you can produce a volume of gas from a volumetric reservoir and still retain the same pressure and furthermore, there's no way that the pressure could have been drawn from the initial reported 3515 down to this 2730 without having some sort of production.

So I've included these to point out where such a thing could have happened.

Q. Now, when you compiled the information illustrated in Applicant's Exhibit 1, what did you do with that information?

A. Well, I took this information and then referring

back to my exhibit Number 2 I generated porosity feet values, water saturation, and took the bottom hole temperature, also calculated average porosities for all of these wells based on well log analysis, and in taking -- and in taking the initial P/z point from these curves, I calculated the gas volume factor, which this gives me standard cubic feet, the ratio of standard cubic feet to a cubic foot of gas reservoir pressure and temperature. From this I've calculated a MCF per acre factor, which is derived volumetric calculations, which is again another standard, and is primarily used when you don't have the pressure information. You know, they have to assume an acreage of drainage and calculate a curve in this manner. And I've just taken the formula for that and moved -- divided both sides by the area to get a factor which will give a recovery factor of initial gas in place per acre based on volumetrics. Then using the initial gas in place from the P/z curve, dividing it by the volumetric factor, I calculated a drainage area.

Q. Now, in this calculation isn't this formula normally used by you and normally used in the industry to calculate a curve like that?

A. Well, in some -- in some form, yes. I know other engineers will look at P/z data and then also they will take this initial -- project initial gas in place, and they'll also calculate initial gas in place volumetrically for, say, the

placing that they're on and see if the two didn't match, and if there's a big disagreement then a lot of times this data will be used to justify infield drilling.

Q. I believe you said that this data was compiled on every well in the Catclaw Draw - Morrow gas field.

A. Well, it's with exception, with one exception. The first five wells --

Q. That is referring to Applicant's Exhibit Number 2.

A. Right. The first five wells listed all have initial -- projected initial gas in place values of less than a BCF. One of the wells has been plugged and abandoned; the other four, spotting them on the map, could be considered edge wells, so due to their low initial gas in place and the fact that there's a good possibility that they are edge wells, I did not include their drainage or calculate drainage for these wells. Probably would not be a -- indicative of the field itself, these being the main wells in the field.

Q. What did the formula calculate for the next ten wells listed in Applicant's Exhibit 2?

A. Well, they range from -- they range from 191 acres to 490 acres. The average was, for these ten wells, 342 acres per well.

Q. And would you explain briefly the resulting data on the last two wells in Applicant's Exhibit Number 2?

A. Okay, the ARCO Pure Federal is completed in a

sidetracked hole. The only logs I had available are through the original hole. I did find a sand that roughly correlates as far as depth to the section that they're producing in the sidetracked hole and assuming that that is the sand that is productive in the sidetracked hole, generated data, generated the parameters that I've used here, and it indicates that this well will drain 620 acres. So I think it's representative, though probably not as reliable as the preceding wells.

Now, my last well is the Catclaw Draw Unit No. 9. The only available logs we had for this well are a cased hole, C&L, and a cased hole FDC. These are not good logs to try to make good quantitative determinations of porosity. In fact, I'll read from what is stated on these logs. The cased hole density reading should not be used as absolute value due to the uncertainties caused by casing and cement. Also on the same log it is stated that a density curve drafted on a C&L for a quantitative indication of gas.

What I've done here is to just project a drainage for the drainage area of this well. The first calculated drainage area is based on using the average field porosities, the average for all the other wells, the average field loss for the other wells, and I calculate a drainage area from 955 acres. Now, in also recalculating it using the maximum porosity, average porosity figure for the other fifteen wells, and the minimum water saturation, calculating a drainage area

436 acres. Now, I would say that that drainage is probably somewhere between these two. I'd say these are probably a high and low value, but based on the logs I have there's just no better way to make a determination, I don't believe.

Q. Have you drawn some conclusions from your review of Applicant's Exhibits Number 1 and 2.

A. Well, I think by taking the closest field which has production history and assuming that this data is creditab to the whole area, I assume the chances of draining 600 or more acres are approximately just about one in six, assuming you don't have an edge well. The chances of recovering closer to, say, approximately 340 acres I believe the most probable insofar as this data is concerned.

Q. The production history relates to wells in the Catclaw Draw - Morrow Gas Pool?

A. Right, you know, this is the closest gas pool to Section 3 that has, you know, good production history.

Q. Were you able to calculate, you know, any drainage areas for the Revelation?

A. No, we -- there's just not -- for one thing, we don't have -- there hasn't been enough production to get a reliable, we feel, P/z versus Q curves.

MR. CAMPBELL: Mr. Examiner, I have no further questions -- I have one further question.

Q. Did you, Mr. Schroeder, prepare these Applicant's

Exhibits Numbers 1 and 2 or were they prepared under your direction?

A. I prepared these exhibits.

MR. CAMPBELL: Mr. Examiner, I move to admit Applicant's Exhibits 1 and 2.

MR. NUTTER: TP Exhibits 1 and 2 will be admitted in evidence.

MR. CAMPBELL: I have no further questions of this witness, Mr. Examiner.

MR. NUTTER: Are there any questions of him?

MR. KELLAHIN: If the Examiner please.

CROSS EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Schroeder, I'm interested in what -- what information or what facts or tests you used in reaching your final conclusions. You mentioned there were some computer analysis done.

A. There was computer generated curves, correct.

Q. All right. Well, there are all kinds of computer generated curves. Which ones did you use?

A. I used the -- it's a commercially -- it's a commercial service. They take the shut-in wellhead pressure tests that are submitted to the Commission and then generate these curves for each well in a field.

Q. Which commercial service did you use?

A. Dwight's (sic).

Q. Do you know which computer series they used in running the tests for the reservoir data?

A. No, I do not.

Q. You wouldn't know, then, whether or not they used the Bexel Van Poolen test to determine the reservoir?

A. No, I would have -- I have no idea exactly what they used. I do know that I did have one test of their calculated bottom hole pressure. There was a well in which -- if I can find it -- there is a well in -- okay, the Hanagan, I believe that's correct, ARCO Federal No. 4, they calculated it was reported a shut-in wellhead pressure of 3504 --

Q. Excuse me, 3504?

A. Yes, PSI, and they reported a shut-in bottom hole pressure of 4447, which gives a shut-in bottom hole to shut-in wellhead ratio of 1.27, and if you look at some of the --

Q. Excuse me, what was the shut-in bottom hole pressure?

A. 4447 PSI. And if you look at the ARCO Federal and take the ratio of the wellhead shut-in pressure to bottom hole pressure -- or bottom hole pressure to wellhead shut-in pressure, you get essentially the same 1.27 ratio.

Q. Does your information show you how long those tests were run?

A. No, the information I have here does not tell how long these wellhead shut-in pressure tests were run. Now, it has been my experience the longer the tests are run, the better the data.

Q. Exactly right, the more accurate the longer the tests.

A. That's correct.

Q. And that's the point of my question, is how long these tests were run.

A. They were Commission-type tests and to be honest, I don't know. Now, to take that into effect --

Q. Well, let me ask you this.

A. Okay.

Q. What was the permeability used? You had certain parameters. What was the permeability?

A. Well, permeability isn't a parameter in this at all. This is basically a material balance, that says that the gas produced is proportional to the gas -- the initial gas minus the gas in place at a certain point in time.

Q. What was the average permeability you found for the Catclaw Draw?

A. There is -- this data does not generate permeability.

Q. Okay. What were the parameters you used, then?

A. The parameters as far as --

Q. Porosity?

A. Porosity. Okay, the porosity parameters I used were -- where I had a sonic log I used a Delta T matrix of 20,000; when I had a density log I used a matrix brine density of 2.67. If I had both logs in conjunction with each other, I generally used the smaller porosity value. I assumed if the sonic was high that it was being affected by shale. I used the density, if the density was higher than the sonic I used the sonic assuming possibly some gas effect on the density. By using the most pessimistic numbers, used to cut down on, for one thing, if I'd used the more optimistic numbers, it would have actually made these calculated drainages smaller, but I used pessimistic values primarily to give some credence to the data, and as far as the water saturation, I used an RW of .07 --

Q. What was that?

A. .07. At bottom hole temperature in talking with other people who do well log analysis in the area, some use .6, which would again cause the drainage areas, if the .06 would have been used, would have caused the drainage areas to again been smaller.

I've used the best available data that I had.

Q. Do you know whether the computer tests that you used were specifically designed for homogeneous reservoirs?

A. Well, the computer test used specifically designed for homogeneous reservoirs, no, these tests that the computer

is taking and generating the bottom hole pressures from are just the statutory shut-in wellhead pressures.

Q. Morrow Formation is not a homogeneous reservoir, is it?

A. No, it is not.

Q. And most of those computer tests are specifically designed and assume the existence of a homogeneous reservoir.

A. Yes, but that does not preclude the use of the data. We've got to use the best data we have.

Q. I understand.

A. We use similar type plots very often, primarily because it's the best available. If we knew the non-homogenic renewity of the Morrow, sure, we could use that as a factor, but we don't.

Q. I understand, Mr. Schroeder. I'm just trying to point out some of the limiting factors.

A. Right.

Q. That you have to take into consideration when, first of all, you use a computer analysis --

A. That's correct.

Q. -- and try to apply it to the Morrow Formation. Not that you didn't use the best available, it's simply that the best available is not always suitable for Morrow production.

What bottom hole pressures did you have for the Belco wells?

A. The Belco wells? The Belco wells are not in --

Q. Yeah, but what's the Revelation - Morrow?

A. Okay, in the Revelation - Morrow there were no bottom hole pressures given. The only information I have is shut-in wellhead pressures and -- okay, for the RV Federal No. 4, the initial shut-in wellhead pressure reported, which I had access to, was 3,309 psi.

MR. NUTTER: What was that number again, please?

A. 3,309 psi. For the --

Q. That is the shut-in pressure?

A. That is the shut-in wellhead pressure. For the Jones Well, it was 2,670 psi.

Q. That's also a shut-in?

A. Shut-in wellhead pressure.

Q. All right, what other pressures did you have?

A. That is all -- those are the only pressures I had for the Belco wells.

MR. KELLAHIN: I could, perhaps, stop at this point, Mr. Nutter, if we could simply incorporate the records of the previous Catclaw Draw - Morrow cases into the record of this case, and I'd like to so move.

MR. NUTTER: Do you have the numbers of those cases?

MR. CAMPBELL: I do, I believe, Mr. Examiner.

MR. NUTTER: I've got them here, too, somewhere.

MR. KELLAHIN: Yes, sir, here they are. The first case was 6-16-71; it was Case Number 4548.

The second case was 8-22-73; and that was Case 4541.

MR. NUTTER: So that's --

MR. KELLAHIN: I think that's reopened.

On 11-15-73 there was Case 5109. On 9-4-74 there was Case 4548, second reopening of that case. And there was a case on 10-12-74, which was 4548, again, that was the third reopening of that case, and I believe there's one more.

MR. CAMPBELL: There are a number of other cases after that date.

MR. NUTTER: I think so. I was looking to see what I have here. I want to get everything we can get into the record here because I want to look at everything we've got in our files.

MR. CAMPBELL: Well, Mr. Examiner, we in addition to those mentioned by Mr. Kellahin, we show Case Number 5311, Order issued on October 22nd, 1974. That was an extension. Case Number 5336, Order issued by the Commission October 9th, 1974. That was the inclusion order Section 3.

MR. NUTTER: Correct. Okay. The record in Case Number 4548, which has been heard three times, and was the original spacing case -- right, four times -- that was the original spacing case for the Catclaw Draw - Morrow, that

will be incorporated. The record in Case Number 5109, and I'm not exactly sure what that case involved.

MR. CAMPBELL: That was the proration -- that was the allowable case.

MR. NUTTER: Okay, there was some data on the Morrow Formation introduced in that case. The record in that case will be incorporated.

Order Number R-4861 was entered in a nomenclature case, which was Case Number 5336. Now, that will be incorporated although the record in that case is very sparse. However, in that case the record in Case Number 5311 was incorporated. Now, 5311 related to the geology in this particular end of the pool and the geology in and around the pool and it was incorporated -- it was the basis for the nomenclature case that came up shortly afterward, and that record was incorporated in the nomenclature case, so the record in Case Number 5336 will be incorporated, which in turn had already incorporated the record in 5311, so here we have Case Number -- we have Case Number 6046, which is the application of Belco. We have Case Number 6067, which is the application of TP; these two are consolidated, and they will incorporate the four cases -- the four hearings of Case 4548. They will incorporate Case Number 5109, Case 5311, and Case 5336. And I don't know of any other cases relating to this matter that we could incorporate.

MR. KELLAHIN: At that point I have nothing further for Mr. Schroeder.

MR. NUTTER: In addition, Mr. Schroeder stated that he had given bottom hole pressures and shut-in wellhead pressures that had been taken under regular Commission --

A. Yes, I believe that is the origin of the pressures that I reported on these computers.

MR. NUTTER: Okay. Now, you didn't know the shut-in time.

A. No, I do not know the shut-in time.

MR. NUTTER: I'd like to take administrative notice of those shut-in pressures that were filed with the Commission because that will show the shut-in time.

A. That's correct.

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

MR. KELLAHIN: No, sir.

MR. CAMPBELL: We have no redirect, Mr. Examiner.

MR. NUTTER: Okay.

CROSS EXAMINATION

BY MR. NUTTER:

Q. Okay, Mr. Schroeder, on your Exhibit Number 2.

A. Yes, sir.

Q. I notice over here on the lefthand column we have

these numbers 1 through 17.

A. Yes.

Q. Does that correspond to the page number in --

A. In the lower righthand corner, circled, right.

Q. Now, in the column Porosity (feet).

A. Feet, right, yes.

Q. Could you give me the feet that you used here in each of these?

A. Yes, sir.

Q. I want to make a new column called H.

A. Well No. 1 I used 24 feet.

Q. 24.

A. Well No. 2, that is the P&A'd well, I didn't list the footage there. Well No. 3 I used 26 feet. Well No. 4, 13 feet. Well No. 5, 16 feet. Well No. 7 --

Q. No. 6.

A. Oh, No. 6, I used 33 feet. Well No. 7 I used 20 feet. Well No. 8 I used 28 feet. 9 I used 32 feet. Well No. 10 I used 42 feet. Well No. 11, 29 feet. Well No. 12, 46 feet. Well No. 13, 22 feet. Well No. 14, 27 feet. No. 15, 16 feet. No. 16 I assumed that the whole interval that they are producing from, which I believe is 29 feet of the H. That's the well -- I'm sorry, the Well No. 17 I used the H of 29 feet, in fact used the -- and then I took that H times the average porosity value for this to get these pH values

here. Instead of working from the pH values I worked from the AJ and the P values to get the H.

As far as Well No. 16, I used 14 feet.

Q. Okay. Now, you got your porosity column over here.

A. Yes.

Q. So this porosity times this H should give us this porosity feet here.

A. Well, what I did -- what I did was to actually tabulate up all, you know, I tried to zone this thing, and say if I had 5 feet of six percent, get a .3, tabulated all the pH's and divided the pH by H to get the average porosity for the whole zone.

Q. Now, this H is whatever pay you saw there on the log, is that correct?

A. That was perforated.

Q. Is that only the perforated interval?

A. Yes. I assumed that only the perforated interval was productive, that there was no communication with any other zone.

Q. Then you also, in other words, if you had pay behind the part that wasn't perforated, it didn't count?

A. No, no, sir, it did not, and in some cases I threw out pay that was perforated.

Q. Okay, now --

A. Lack of porosity.

Q. Okay, now -- and this is not all confined to Lower Morrow. This would be up and down --

A. Yes, sir, the whole shooting match there.

Q. So there wouldn't be any correlation then between the H shown here and the Isopachs for Lower Morrow or Upper Morrow depths, Mr. Keyes showed on his exhibits?

A. Well, it -- if the two agreed, you would assume that there was no pay behind pipe; that would be one thing you could say. Of course, he included pay behind pipe.

Q. Right.

Okay, now the salt water -- saturation of water, here --

A. Water saturation, yes.

Q. How was that derived for each individual well?

A. Okay. Like I say, I zoned it. I zoned these things and I went to the electric log and for each zone I got the resistivity reading from the electric log. Sometimes electric logs, they're a deeper reading tool; then you'll have to say you'll get -- you won't see the zonation that you will on a porosity log, so sometimes I had to include like three porosity logs to one reading of the resistivity log. But for each of these zones for the resistivity log, the zonations that I made on the resistivity log, I calculated -- and then I would take the average for -- if it was a single zone from the porosity -- from the zonation I made in the porosity;

used the porosity and that resistivity from the electric log and the RW .07 to calculate a water saturation, and it took, for each zone, I took the average or the water saturation for that zone times the pH number to get a PHSW, tabulated all of those, divided that by the total pH to get the average water saturation.

In effect, what I've done, I've taken a PHSW for each zone, as I zoned these logs.

Q. Okay. Now, the average water saturation, then, according to the No. 17 Well here, the field average is 33 percent, then.

A. 33 percent, that's correct.

Q. Now, your lower figure there, the 22, according to the footnote, is the minimum for the field, which is from the No. 16 Well that's immediately above, is that correct?

A. That, and also the No. 15 Well.

Q. The No. 15 also.

A. And the fact that if you look on 15 it also gives the highest average porosity that I calculated, which -- so I used, you might say I used the porosity and water saturation from this 15 Well, which is -- which was the max and min; also the min for the -- the 22 percent also repeated itself for the ARCO Pure Federal.

Q. And where did you derive the bottom hole temperature?

A. The bottom hole temperature I took it straight off the --

Q. Straight off the logs?

A. -- wellhead. Yes, the log head.

Q. And you've explained your average porosity and your P/z is a calculation of this pressure over the z factor.

A. No, I actually got the P/z's by extrapolating factors, the initial P/z's on the first well, like has been pointed out, I don't know exactly the parameters used by this company to calculate z factors, and I didn't think it would be consistent for me to calculate z factors on one set of parameters and for -- and then to use another set of parameters for -- that this company is using, so to remain consistent, I used the extrapolated value of P/z.

Q. From Exhibit Number 1?

A. 1, yes, sir.

Q. Okay.

A. The initial P/z's.

Q. Now what is this next column?

A. This is the reciprocal of the gas formation factor.

Q. Okay, this is the data factor for the gas initially, is that correct?

A. Right.

Q. That's what the sub-i means, that's the initial -- that's the reciprocal of the initial gas data factor?

A. Right, to get it in standard -- normally a formation volume factor is in reservoir volume per standard volume, and I wanted this in volumes of standard cubic feet per cubic foot of gas at formation pressure and temperature.

Q. Then the next one is initial gas in place per acre, is that correct?

A. Yes, and this is calculated from -- this is strictly the volumetric formula for calculating gas in place. Generally, the A would be on the other side and this is the formula we usually use initially to project reserves, and usually we make a guess as far as the A factor, the acreage.

Q. Now, the next column initial gas in place is derived from Exhibit 1, is that correct?

A. That's correct.

Q. And then you take the initial gas in place and the initial gas per acre and divide one into the other and come up with your drainage area?

A. Yes, sir.

Q. And the smallest drainage area you have calculated is 191.

A. That's correct.

Q. And of the ten-well average for the group of wells there it's 342 acres drainage area.

A. No, that's -- yeah, the average. The maximum -- within that group of wells the maximum was 490.

Q. Now this well next, No. 16, the Pure Federal -- the ARCO Pure Federal, where is that well?

A. It is -- it is not on the exhibit, I'm sorry to say. The well is -- this is Well No. 16. It is a north offset to the Hanagan Catclaw Draw Unit No. 7. It is located at -- in Section 11, which is the section directly north of Section 14, and it's located in the northeast corner of the southwest quarter of that section.

Q. And then the next well, this Hanagan Catclaw Draw Unit No. 9, which under one calculation shows a drainage area of 955 acres and under the other calculation shows a drainage area of 436 acres, is the closest producing well, or one of the two closest producing wells, to Section 3, is that correct?

A. That's correct. But I'd like to point out that there is, again, a dry hole, a couple of dry holes between that well and Section 3.

And just to reiterate that the log -- the logs used were just -- you just can't derive any quantitative numbers from the logs that they ran.

Q. So while Mr. Keyes Isopach for the Upper Morrow shows only six feet of pay in the Upper Morrow for that well, his other exhibit on the Lower Morrow shows that it has 34 feet of net pay, is that correct?

A. That well is completed in the Lower Morrow.

Q. And it's completed in the Lower Morrow.

A. And this -- that is the 26-foot value that I used. Possibly this could be --

Q. Now, your calculations, Mr. Keyes, shows pay behind the pipe?

MR. KEYES: Yes, sir, it does.

Q. So you've got 34 feet there on that well? He shows 26 feet because he's showing perforations only.

MR. KEYES: Yeah, but there's another zone above that that possibly could have gas in it.

MR. NUTTER: Are there any other questions of Mr. Schroeder?

MR. KELLAHIN: Just a couple, Mr. Nutter.

RECROSS EXAMINATION

BY MR. KELLAHIN:

Q. In preparing Exhibit Number 2, Mr. Schroeder, is it necessary to use an abandonment pressure factor?

A. No, not in the method that I've used here. This -- these, I'm going initial gas in place. Now as far as how that relates to reserves, if you're wanting to get reserves for each well, then you would need an abandonment -- an abandonment volume factor in order to make the volumetric calculations --

Q. And a recoverability?

A. -- and also an abandonment pressure in order to get

the remaining gas in place that you leave from the P/z curve.

And insofar as I really don't have any feeling as far as what the use for abandonment pressure, I decided to go with strictly the gas in place.

MR. NUTTER: Well, it actually takes it down to a zero pressure.

A. Right, that's correct.

MR. NUTTER: And the well would actually be abandoned at some point above that.

A. Right. The way we'd normally -- or the way I'd normally do it is I calculate what the economic limit is going to the back pressure equations and assume the well is going to be riding line pressure at that time, back calculate the reservoir pressure that it would take to -- to produce at the economic limit and go back in to bed, but I haven't --

MR. NUTTER: But you can't foresee what the pipeline pressure is going to be or what the suction on a compressor might be.

A. Well, you have to make the best estimate if you're trying to get, and of course, the economic factor is the gas prices.

Q. (Mr. Kellahin continuing.) If I understand you, Mr. Schroeder, calculations in Exhibit 2 make the assumption that you would recover all the gas down to the zero pressure?

A. That's correct. The calculations are initial gas

in place, not producible gas.

Q. Tell me again, with regard to your exhibits, how do they relate to the question of Section 3?

A. Well, insofar that this is the closest field in which we have production or production history, and this would be the field in which to try to derive what to expect the drainage area to be for Section 3.

MR. KELLAHIN: I have nothing else.

MR. NUTTER: If there are no further questions the witness may be excused. I think you've already offered your exhibits, Mr. Campbell?

MR. CAMPBELL: Yes, sir.

MR. NUTTER: Does anyone have anything they wish to offer in Case Number 6067?

MR. KELLAHIN: Yes, sir, I have a witness to call.

MR. NUTTER: Okay. Do you want to wait until after lunch? How long --

MR. KELLAHIN: I guess so. Oh, I don't know, it may take some --

MR. NUTTER: Take some time. We'd better break for lunch, and we'll recess until 1:45.

(Thereupon the noon recess was taken.)

MR. NUTTER: The hearing will come to order, please and we'll resume now with Case Number 6067. Mr. Kellahin?

MR. KELLAHIN: Yes, sir, I'd like to present the

testimony of Mr. Nering. He's been sworn.

LEE G. NERING

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Nering, would you state for the record where you are employed and in what capacity?

A. My name is Lee Nering. I'm employed by Belco Petroleum Corporation as Administrative Geologist in Houston, Texas.

Q. Mr. Nering, as a geologist, have you made a study of the Catclaw Draw Formation? I'm sorry, Catclaw Draw Pool and the Revelation - Morrow Pool in Eddy County, New Mexico?

A. Yes, I have.

Q. Have you read the previous Commission cases with regards to the Catclaw Draw - Morrow?

A. Yes, during the course of investigation in May of 1977 I had occasion to review the Catclaw Draw - Morrow Pool, particularly with respect to 620-acre spacing.

Q. Have you made a study of and are you familiar with the exhibits introduced by Texas Pacific with regards to this particular case?

A. When we speak of cases, since this is a combined case, yes, I'm familiar with the exhibits presented in Case Number 6046 and Case Number 6067.

MR. KELLAHIN: If the Examiner please, are the witness' qualifications acceptable?

MR. NUTTER: Yes, they are, please proceed.

Q. Mr. Nering, would you please refer to what we've marked as Belco Exhibit Number 1 and identify it?

A. Exhibit Number 1 is a structure map. The scale of the map is one inch to 2000 feet, contoured on what we describe as a Morrow Marker map. It differs from the Exhibit Number 1 presented in Case 6046 in that it's taken at a somewhat lower level within the Morrow, in Belco's opinion somewhat more representative of the structural conditions in the Morrow. I wish to modify this remark by saying that structure is a factor and in spite of the fact that some testimony has been entered, not only in Case Number 6046 and 6067.

Structure is only one of the factors that determine that productivity of the Morrow, and since the Morrow is spaced within the Catclaw Draw - Morrow Pool in its entirety, Belco felt that the best possible structural configuration would be representative of something near the middle of the Morrow, rather than taking something near the base or near the top.

This exhibit is intended to illustrate the relation-

ship between the Catclaw Draw - Morrow Pool and Belco's Revelation - Morrow Pool. I think it demonstrates, as has been testified, that we're dealing with what we call a ridge, structural anticlinal ridge, if one prefers that. In some ways this resembles Belco's activity with six or eight Morrow penetrations about eight miles to the east in the Carlsbad South Morrow Pool, in that the Morrow production is associated with an anticlinal structure bounded on the west side by a syncline and in some cases interpreted to be faulting. The evidence for faulting is unclear. There is, perhaps, some indication of faulting in this area; however, that is unclear.

The --

Q. Would you directly compare Belco Exhibit 1 with Texas Pacific Exhibit Number 1, I believe?

A. Yes.

MR. NUTTER: Now, we're comparing Exhibit 1 in Case 6067 with Texas Pacific Exhibit 1 in Case 6046, is that correct?

A. That is 6067 and 6046.

MR. KELLAHIN: That's correct.

A. Correct, yes. It can be noted that the position, the structural position even at the top of the Morrow in Case 6046 indicates that the Morrow contours on the top of the Morrow are attempting to conform to the curvature determined by the Belco Jones No. 1 Well in Section 9. The Belco 10-1

Well, being located in Section 10: both of these being in 22 South, 25 East, in which event it's entirely possible, as I have shown with this interpretation, to show a structural saddling, structural separation by contour, between Section 10 and Section 3.

MR. NUTTER: Excuse me a minute, Mr. Nering. That Belco RV-10 - 1, that is a minus 6965 or is it a 67 --

A. It's a 9, both of those are -- the Jones in Section 9 and 10, those are both 9, 6917 and 6965.

MR. NUTTER: Okay, thank you.

A. As a geologist, I'm not going to be, let's say, foolish enough to say that these contours either of Texas Pacific exhibits or our exhibits are ipso facto. They are interpretive in both cases. As was pointed out during the cross examination in the previous case, certain degree of license can be used with contouring. I think the most important thing is that a structural map shows a direct continuation of this ridge between the Catclaw Draw - Morrow Pool and Revelation - Morrow area. There is no doubt by either one of these maps, in my opinion, that there is structural continuation, and I think that ends what I feel is the important -- importance of our Exhibit Number 1.

MR. NUTTER: The main difference between the two is that yours is on the Morrow Marker, which is approximately the middle of the Morrow section?

A. Yes, sir, that --

MR. NUTTER: And Mr. --

A. -- and I saddle it further to the south.

MR. NUTTER: And Mr. Keyes is drawing his structure map on the Morrow Clastic. Now where is the Morrow Clastic with relation to this Morrow Marker?

A. I think that we can then in that case, for identification purposes, refer to Exhibit Number 4 of Case 6046 and I think you'll find that Morrow Clastics are defined as being the datum Morrow Clastics, which Belco calls top of Morrow, and I must say there is practically no disagreement between Belco and Texas Pacific in this regard.

MR. NUTTER: Okay, now we've got this cross section here. Let's take one of these wells and identify the point that Mr. Keyes shows on his exhibit and the point that you're showing for that same well on this exhibit.

A. Well, I think the easiest things to pick out are the one on the left, the RV-4.

MR. NUTTER: Okay, the RV-4 will be fine.

A. On the left of the cross section. That point would be approximately, if I can read it on this cross section, at 10,070, call it, I'd have to -- 10,070. Excuse me, 10,670.

MR. NUTTER: 10,670.

A. Yeah, approximately.

MR. NUTTER: Okay, that's the heavy line, then,

that crosses this cross section that separates the Upper and the Lower Morrow.

A. It's below that -- it's below that point. It's a point, we feel, that is reasonably correlative, although I might point out that as long as we're discussing correlations, that it can be noted from this cross section that individual sand members are not shown to be precisely correlative, only markers, specific datum point. I think this is a classic example of correlations within the Morrow regardless of the proximity of the wells. I think the importance of the cross section demonstrates that gross correlations are in fact just that factual; individual correlations are somewhat in doubt, and as far as specific correlations are concerned, one must be exceedingly careful about making precise individual correlations, and I think this statement is born out by the testimony at the previous hearings on Catclaw Draw.

Q. (Mr. Kellahin continuing.) Would you please refer to what we've marked as Belco Petroleum Corporation Exhibit Number 2 in Case 6067 and identify it?

A. Belco's Exhibit Number 2 in Case 6067 is what I describe as a total Morrow productive sand Isopach and trend; the key words being "trend" and "Isopach", and "productive".

Now, productive means in this case sands that are not necessarily perforated. Sands that are in the opinion of Belco productive. Now there are going to be differences

shown between our interpretation of the parameters being used for these well points from Texas Pacific exhibits Isopaching, their Exhibits Number 2 and 3.

I might point out for your convenience what these differences are. You'll find the differences being in the Belco wells and in the Hanagan North Fork Well, which is shown on the Exhibit Number 4 of Case 6046, which is erroneously shown as a dry hole on that cross section but is, in fact, a producing well, and I have honored a degree of thickness to that well.

I think during the earlier part of this particular hearing, 6067, it was determined that the point was being honored by Texas Pacific as being a zero point. Belco is not of this opinion, and I would refer to Texas Pacific's Exhibit 4, the cross section, and draw your attention to the fact, which I think has already been illustrated, that the perforations in the Morrow of some 22, 23 feet, are in a sand zone of 25 or 26 feet thick. I have honored it as having approximately 10 feet of potential productivity. It should also be noted that in the caption associated with this well on this cross section, that this well did, in fact, produce 300 MCF per day, and it's my opinion that Mr. Hugh Hanagan will not walk away from this well until he goes back to that zone. In Belco's opinion, I believe that this probably could have made a well. We have been successful in completing wells

something of this same character and perhaps a little out of my specific area of expertise, which is primarily geological, I am familiar in my administrative duties with production techniques, and the Morrow is a roof of rocks that is particularly sensitive to productive practices, and Belco has had sufficient experience in this area to know that no one completion practice is going to resolve any one or any of all wells in the Morrow, and as such, I would honor this point. In any event, whether one wants to argue whether or not that particular sand has ten feet, five feet, three feet, it did produce Morrow gas and I would invite anyone with a knowledge of the density logs and pick out what percentages are involved Mr. Keyes stated that the porosity involved in this instance was around seven percent, which he felt was a cutoff point. Mr. Keyes should be informed that Belco uses about a six percent cutoff point and we are being very successful in completing wells in this area.

And I personally think that if we tried hard, we might even get that.

Q. Would you point out apart from the Hanagan well, would you point out those Belco wells in which you and Mr. Keyes have reached a different pick of the net feet of pay?

A. Yes, actually it's all three wells. We'll get both of the Texas Pacific exhibits out. Let's draw attention, first of all, to the Belco RV - 4 - 1, which is in Section

4. Honored with 9 feet of Lower Morrow net pay. I don't know as I would necessarily disagree with whether it's Lower Morrow, Uppoer Morrow; my contention is that we're dealing with the entire Morrow as far as completions are concerned. We've given this well a total of 51 feet of pay. At this juncture I'd like to point out that the combined Upper and Lower Morrow Isopaching net pay maps by Texas Pacific illustrate a maximum of 80 feet combined, combining the two wells -- the two Isopachs.

The other area -- well, before we leave the 4-1, I have a copy of our work completion log on this well. I didn't intend to enter this as an exhibit, but if the Commission desires to examine this log or Texas does, I'd think they would be surprised with what can be done and how Belco arrived at its determination as to what is pay and what is not pay.

MR. NUTTER: And your normal percentage is six percent?

A. I wouldn't say normal. I would say that we would give it a darned good try at six percent, yes, sir.

But this matter of cutoffs is fairly arbitrary particularly in view of permeabilities, and permeability is probably the most critical factor, and that if you can overcome the permeability, even in very low porosity Morrow Sands, I think you can still make a quote Morrow well, and in my

opinion, a 300 MCF a day Morrow well is still a well.

Q. Let me direct your attention to the Belco RV-10 Well.

A. The RV-10 Well on the Texas Pacific Exhibit Number 3 is the Lower Morrow net pay. It's given a -- on a point of zero it might -- I realize Texas Pacific didn't have the knowledge that Belco had on this well; they're not privy to our internal activities, but it might be interesting to note that we have 4 feet of perforations in quote the Lower Morrow.

MR. NUTTER: I believe, Mr. Nering, at the time of the last hearing that well was just being completed.

A. That is correct, yes.

MR. NUTTER: Has that well been completed now?

A. No, sir, it is shut-in waiting on a potential test. It is shut-in.

MR. NUTTER: You have not had a test on it, then?

A. We are planning to four-point that well into a pipeline; a pipeline is coming into this area, which I might add has, I think, some bearing on the entire matter; it was brought in here Belco's contractual relationship, and we plan to test into the pipeline on four-point, so it is shut-in, at the moment.

MR. NUTTER: You do have a well, though?

A. We tested it, I believe I gave the figures -- I don't have my -- it was in the order of a million nine at

maximum, something of this order.

But I think an important point of my testimony at this point is the fact that there are 4 feet of perforations open in the Morrow and in addition on my Isopach, we have an additional 19 feet pay in that well of which 6 feet is not perforated, and as such, I think one has to use that as a point of control for Morrow productive sands.

The other well that differed considerably, of course, is the Jones Well, which on their Exhibit Number 2 from Case 6046, gives the Jones Well 42 feet.

Q. That Jones Well is in Section 9?

A. Section 9, and we've given it a total of 63 feet. We're not too far apart on this one, and again I invite the Commission to examine our work copy of what we believe to be pay in this well and all pays are open in this well.

MR. NUTTER: Do you give it anything in the Lower Morrow?

A. Lower Morrow. There is a slight difference of opinion as far as Lower Morrow is concerned. I think if I may pass this down. This pic on Lower Morrow is going to be slightly different than shown on the structure map, but we might point out that the sands that are at this interval within the Morrow Sands.

MR. NUTTER: Now this is the log on the Jones Well?

A. Yes.

MR. NUTTER: Well, all your perforations are in the Lower Morrow, aren't they?

A. I think they're marked on there.

MR. NUTTER: It would appear that the Lower Morrow is here, you've got it identified at 10,383.

A. Yes.

MR. NUTTER: And you've got perforations on down --

A. Below that point, yes, sir.

MR. NUTTER: -- below that point.

A. I also want to point out that --

MR. NUTTER: But Exhibit Number 3 on Lower Morrow Keyes gives it zero in the Lower but he does give it 42 feet in the Upper.

A. That's why I pointed out that this is a matter of correlation and that we are disagreeing something in the tune of 50 feet on Upper Morrow and Lower Morrow.

MR. NUTTER: You think you're disagreeing on where the marker is?

A. Yes.

MR. NUTTER: I see.

A. It's -- it's so close though, that we would prefer as far as completion is concerned, say Lower Morrow, it compares somewhat to the zones that are present up in Catclaw Draw, slightly higher continuity of reservoir communicatio. is probably doubtful being this far away, but the fact remains

that there's very significant sands in the, let's say, lower part of -- let's say that in quotes -- lower part of the Morrow in the Jones Well, as well as in the 4, and as well as in the Number 10 Well, and the point of all this is simply that we think that when we're describing zones of projection for Morrow production, the Isopaching is going to show a very distinct trend, and I'd like the Commission to take our plats, both structure and Isopaching, and overlay them on the three Texas Pacific exhibits, being the two Isopach maps and the one structure map, and I think you'll see a great deal of coincidence in trendology, and as such we contend for the moment Section 3 was of course at one time decided by the Commission to be within the Catclaw Draw - Morrow Pool and that -- and I'm digressing at this point -- that since Belco became interested in commencing activity in this area, we have honored Section 3 as having 640-acre spacing, and accordingly, programed our spacing for Revelation Pool. We were well aware of the findings and the limitations of the horizontal limits to Section 3, because we were, of course, quite concerned about the one-mile development rule when we drilled the Jones No. 1, as to whether or not we would be spaced 640 or 320, but upon determination by phone call to the Commission at that time we determined that Section 3 was indeed spaced for 640 and as such we proceeded in early 1976 to program our spacing on the basis of 320 acres for new pool.

Q. Mr. Nering, do you have an opinion concerning whether Section 3 ought to at this time remain spaced on 640 and be part of the Catclaw Draw - Morrow or whether it ought to be down spaced and placed in the Revelation - Morrow?

A. I think I can best answer that by repeating what I've just finished saying, that Belco proceeded with its plans earlier assuming that Section 3 was -- we didn't assume, we found out for certain, that it was spaced 640 acres, and we designed our program, and I think in view of the absence of any specific further control and the fact that in our opinion a trend both structurally speaking and in particular Isopaching productive Morrow Sands can clearly be shown to extend across Section 3, I think that in my opinion it should be still spaced 640 acres.

Q. In your opinion, Mr. Nering, will the denial of Texas Pacific's application be in the best interests of conservation?

A. In view of the existing regulations, yes.

Q. Would it -- would denial of the application avoid the drilling of unnecessary Morrow wells?

A. In denying of the Texas Pacific application?

Q. Yes, sir.

A. I'd have to answer that by saying that denial reducing the number of wells, would probably be that case at this time. I can only say that in view of all engineering and

all geological information, that the future may hold different plans, but in view of the fact that no well is that, I think it should remain 640 acres.

Q. Were Belco's Exhibits 1 and 2 prepared by you directly?

A. Yes.

MR. KELLAHIN: We move the introduction of Exhibits 1 and 2.

MR. NUTTER: Belco Exhibits 1 and 2 will be admitted in evidence.

MR. KELLAHIN: That completes my examination.

MR. NUTTER: Are there any questions of the witness?

MR. CAMPBELL: Yes, Mr. Examiner.

MR. NUTTER: Mr. Campbell.

CROSS EXAMINATION

BY MR. CAMPBELL:

Q. What, Mr. Nering, what's the spacing of the contours in your Exhibit 1, do you have it marked down?

A. Yeah, it's marked clearly, CI equals 50 feet.

Q. Are you aware that at the time Section 3 was included in the Catclaw Draw - Morrow Gas Pool, that the dry hole now in Section 34 was not in existence?

A. Yes, I am.

Q. And would it be your opinion that a dry hole in Section 34 would have some impact on the -- on the delineation of the boundaries of the pool toward the southwest corner?

A. I think my Isopach map indicates clearly what my answer to this would be.

Q. Well, we'll get to that. What is your reason for closure of that --

A. I don't have to close any of them. As indicated on the cross examination on -- in Case 6046, geological license can be used. You don't have to close those contours. You can pull them through there, there's room.

Q. But you did close them?

A. I certainly did and I mentioned in my testimony this time that this particular structural feature resembles the South Carlsbad Morrow feature very closely, on which we know for certain that these items do close, do in fact close, so that you have considerable Morrow control. This does resemble that, and let's say that based upon my experience factor from South Carlsbad Morrow Pool, which lies about eight, nine feet to the east. It is a trend structure.

Q. Now, referring again to both maps, you show closure in Section 3.

A. In both cases.

Q. Yes. And it is your contention that those maps indicate a syncline or a saddle separating the -- or indicating

a separation of the Catclaw Draw - Morrow Gas Pool somewhere toward the southwest corner of Section 35.

A. No, they do not.

Q. You indicate no breakage there?

A. No. The contours, as I indicated, you asked me about whether or not I could pull the contours through, and I said I could, there's space, in which case that's not breakage. Breakage means that you'd have to close all the contours between the two points you're suggesting, total breakage.

Q. So it's your contention that there is a straw through those dry holes?

A. Straw, call it what you like, it's a distance of something like three-quarters of a mile; that's a pretty thick straw.

Q. Well, now, if that is your contention, why are you so anxious to site your well in the southwest quarter rather than up in the northeast quarter where that straw is coming right through?

A. I think you can see from both of these maps why, on both structure and on the Isopach map those wells are located in the center of a closure and in anticipation of your next question, why not the northeast quarter?

Q. That was my last question.

A. Well, proximity, geography, and the best geology

in the world isn't -- many, many times proximity alone.

Q. Did you use a water saturation factor in your six percent calculation?

A. Well, water saturation factor in six percent, we have variant and marked in these logs there's quite a variation in water saturation factors. I would say we can't generalize in terms of water saturation since we're dealing with I didn't bother to count the number of sands, but there is variation, considerable variation, and I don't think that you can say any one water saturation is totally valid. I would say in all instances it's certainly less than fifty percent.

Q. Now you have heard the parameters that were outlined by Mr. Keyes in computing this data reflecting a seven percent factor.

A. I did.

Q. I don't believe that you indicated that Belco always uses a six percent factor, did you?

A. I indicated that we like to shoot at that; we like to aim at that six percent. Anybody's going to prefer something greater than six percent, but we're not going to limit ourselves arbitrarily, and I think this is a cardinal rule in all explorations, that you do not limit yourself by arbitrary parameters.

Q. Do you -- do you believe that that parameter is affected by -- by the location -- by the Morrow Formation?

The six percent?

A. No, I do not, no. I venture to say that given rocks being what they are and subject to things other than native porosity, rocks are also affected by fracture and other conditions which are not necessarily a direct function of the matrix porosity, so one says that rock has six percent matrix porosity, he's limiting himself to a potential completion.

Q. Is the seven percent factor unreasonable?

A. Unreasonable, for what?

Q. For a criteria in setting parameters for compilation of this data?

A. His data? I can't answer that. That's his data.

Q. Now, I'm not quite sure that I understand how you have viewed this matter in relation to Section 3. Is it your contention that there is a large straw splitting the two dry holes?

A. A straw? Again I repeat, that distance -- first of all, my testimony indicated that we were ignoring as a zero point the Hanagan North Fork Well.

Q. Let me get to that for a second. You understand that we have set a parameter of seven percent on that particular well.

A. You did; I didn't.

Q. Well, we have set the parameter. You are question-

ing the parameter; you're not questioning the fact that using our parameters that's a dry hole in the Morrow, is that correct?

A. I question your zero line running through it on the basis of the fact that the well did make 300 MCF of gas a day. It did make 300 MCF a day.

Q. But using the seven percent factor, that is a dry hole in the Morrow, is it not?

A. Not in Belco's opinion.

Q. But Belco is using six percent. You're questioning the fact --

A. I said only that Belco aims at six percent. We don't hold ourselves arbitrarily to six percent.

Q. Are you contending that there is pool connection that runs through Section 35 into Section 3?

A. No, I'm not contending that. I'm contending from the Isopach map that there is continuity of productive sands through there. In fact, I think I said that to expect communication between the Belco Jones Well and up there in Section 35 is asking a whole lot. I don't think they communicate. I think it's just a combination of sands that are associated with the structural and Isopaching trend.

Q. Have you prepared data which would indicate that Section 3 can drain 640 acres?

A. I can't prepare that because there's no well there.

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

MR. NUTTER: If there are no other questions of the witness he may be excused.

MR. CAMPBELL: Mr. Examiner, I would like briefly to recall Mr. Keyes.

MR. NUTTER: You don't have any other witnesses?

MR. KELLAHIN: No, sir, I'm through, thank you.

MR. NUTTER: Okay, Mr. Keyes.

REGINALD C. KEYES

being recalled as a witness, testified as follows, to-wit:

REDIRECT EXAMINATION

BY MR. CAMPBELL:

Q. Mr. Keyes, have you had the opportunity to review Belco's Exhibits 1 and 2?

A. Yes, briefly during the testimony of Mr. Nering.

Q. In your opinion, what is the validity of Belco's Exhibits 1 and 2?

A. Well, just as Mr. Nering mentioned, contouring, structural contouring is highly interpretive, so I suspect mine is just as interpretive as his. On his Exhibit 2 I would like to know that if these sands are productive, why you compare the Hanagan No. 1 Round Mountain with the Hanagan No. 1 North Fork Unit.

MR. NUTTER: Now, where is the Round Mountain, Mr. Keyes?

A. It's the one in Section 34, sir.

MR. NUTTER: Okay, that's Round Mountain?

A. Yes, sir.

MR. NUTTER: Now, what was your statement again? Compare the Round Mountain with what?

A. If you compare the Round Mountain with the Hanagan No. 1 North Fork Unit, which is the well in Section 2 of 23 South. There are some interesting comparisons that can be made. I refer you to my Exhibit Number 4 so that you can just follow through.

MR. NUTTER: They're right next to each other there.

A. Yes, sir, they're right next to each other; that's number one. The Hanagan Round Mountain in the Upper Morrow they produced 250 MCF plus water. If you go across there and look in the North Fork Unit, that is a tight well up in that horizon there.

Going back to the Round Mountain comparing it to the drillstem tests of over 400 feet and all they recovered was gas cut mud. You compare that with the Hanagan North Fork Unit where the perforations are, and you see that the Hanagan No. 1 Round Mountain is a tight well, yet the Isopach, Mr. Nering's Isopach, show productivity going through those

sands, through that -- between the two wells -- productive sands passing through both wells, and yet this would substantiate that there those -- both wells are tight.

As far as Mr. Nering's six percent cutoff, this, I did not at any time in my testimony say a six percent cutoff would not produce. My seven percent cutoff is based on a well with seven percent porosity has a better chance of making a commercial well than one with six percent. Six percent can produce but the reserves are going to be on the low side.

If you were to compare and further look on the Hanagan No. 1 North Fork Unit, they also took a drillstem test on the lower portion, the very lowest portion. It's marked on my exhibit by a reversed z. That well recovered water. You go across there and part of those sands are missing and yet the sands presented in the Round Mountain Well are tight, so leaves in the Round Mountain Well just that interval between the first drillstem test and the second drillstem test in the Upper Morrow, and if you look at the density, there is no way you can -- using a seven percent cutoff, get sixty feet or even, I would venture to say, that even using six percent you can get sixty feet of porosity going through, or productivity going through that, even though that's a -- zero -- he zerod off that well, but you can't and he shows a sixty foot Isopach value line there right at the junction

of Section 3 indicating that -- and then of course, further up in Section 35, depth sixty foot also picks up again.

But if you compare between the two wells, it would indicate that both are tight wells and it seems rather impossible -- improbable that you can fathom something as much as sixty feet of productive sands in between those two wells.

And as far as going back to -- digressing -- his digressing on his No. RV-10, he has 4 feet of perforations in the Lower Morrow, yes, but that does not fall within my parameters. Secondly, can Mr. Nering definitely say that those sands are contributing any productivity? Did he run the horizontal survey on that well to show whether those wells that have those perforations are actually contributing to the bore hole?

So there are differences and one of the differences is because I have set high parameters, but in no way can I accept this. In my opinion, it's forcing these things through Now, this is a good exploration tool, go for an Isopach for your sands and running them through. It's a good thing for explorations but not for development. We have to use the more finite in development work.

MR. KELLAHIN: I believe that's all the questions -- statement we would have.

MR. NUTTER: Do you have any questions?

MR. KELLAHIN: No, sir.

CROSS EXAMINATION

BY MR. NUTTER:

Q. Mr. Keyes.

A. Yes, sir.

Q. Now, on your Exhibits 2 and 3 you showed on this Jones Well, you showed 42 feet in the Upper and no feet in the Lower Morrow pay.

A. Yes, sir.

Q. Now, Mr. Nering's testimony was that all of the perforations were below the marker that separates the Upper and the Lower Morrow.

A. All right, on the No. 1 Jones --

Q. Where did you pick the --

A. My marker is at 10,4 -- about 424.

Q. Which would be the marker --

A. That's the marker at the top of the Lower Morrow. This is where that shale break comes in, so in my Isopach, or my zonation of the Upper and Lower, I place that in the Upper.

Q. I see. And he's got the Lower Morrow, the top of the Lower Morrow picked at 10,383 and you picked it at 10,424?

A. About 10,424, this is the top of the Lower Morrow.

Q. So we not only have different parameters, we've also got different correlations.

A. Different correlations. I think that all in all

we're looking at the same thing but in just a different light. He's calling it one way; I'm calling it another way. And also I'd like to correct one statement Mr. Nering made, that I erroneously put the Hanagan North Fork Unit as a dry hole. If you'll look on my caption on the structure map, Exhibit 1, you will see that I said my legend showed dry in Morrow; Morrow dry hole. I did not say that -- that was a dry Morrow Well. I also listed on my cross section that that was a shut-in Wolfcamp gas well.

Q. All right, I realize that.

A. And as far as the pay in that well again, it does not fit my parameters. I have to leave it at zero and I know Mr. Hanagan as a personal friend, and I know Mr. Hanagan would not walk off of anything that he had any pay in.

Q. Do you think he'll come back to the Morrow?

A. No, I don't think he'll come back. I think he would have produced that because his well is a shut-in gas well; it's been shut-in since '76. He hasn't produced one MCF out of the Wolfcamp, and if he could have made money, knowing him, he would have been producing down here, not up there.

Q. Well, is there any reason why they wouldn't buy the gas from the Wolfcamp?

A. I have no idea.

Q. Is it the quality of gas?

A. No, sir, I have no idea what his problem is, why he can't get a gas contract or why he hasn't produced that well.

Q. I think your exhibit shows that the well has a calculated absolute open flow of 1.2 million in the Wolfcamp.

A. That's Wolfcamp potential, yes, sir, and I specifically did that to -- not to confuse that that was a dry hole, complete dry hole, only the Morrow, because this is where we are discussing, what we are discussing. As far as I'm concerned, that is a Morrow dry hole.

Q. Do you know what kind of a test he took from the Morrow when he tested the 300 MCF a day?

A. No, sir, I don't. What was on there is just what we get from the commercial scouting service and that's what we put on there.

Q. But it was after an acid treatment?

A. After 5000 gallons of acid.

MR. NUTTER: Are there any other questions of Mr. Keyes? He may be excused.

Do you have anything further, Mr, Kellahin?

MR. KELLAHIN: I'd like to make a brief statement, if I may.

MR. NUTTER: Would you, please?

MR. KELLAHIN: Mr. Schroeder testified with regards to the drainage calculations he had made with regard to cer-

tain of the wells in the Catclaw Draw - Morrow. We've incorporated in the record the previous Catclaw Draw cases and I'd invite the Examiner's attention to the hearing on 9-4-74, Case 4548, Inexco in their Exhibit Number 1 summarized and certain testimony with regards to reserves and estimated drainage calculations, and I'll simply give you a copy of that information; it is a matter of record in the file.

MR. NUTTER: That is an exhibit that's in a hearing of a case that we have reincorporated -- that we have incorporated.

MR. KELLAHIN: Yes, sir.

MR. NUTTER: Okay, we'll just put that in. It will be handy to look at then.

MR. KELLAHIN: There are several points that I would like to refresh the Examiner's memory on. First of all is the unique problem of having Belco or any operator of a proposed section, such as Section 3, placed in a position where they have to come in and substantiate the number of acres to be drained prior to the completion of the well. We seem to have gotten ourselves in that situation. By filing a forced pooling application we are interested in drilling the well based on 640 acres for Section 3. We have for a considerable period of time made a good faith effort to accomplish that purpose. The Commission has heard this type of case with regards to the Catclaw Draw for some time and

that the rules for Section 3 have been in effect since the 1st of November, 1974, and they've continued to be based on 640-acre spacing up until the present time.

We believe that it would be inappropriate to down-space this particular section and take it out of the Catclaw Draw without more evidence of record.

The testimony that you've heard today and the burden is upon Texas Pacific to show you that there is a substantial evidence that Section 3 ought to be excluded from the Catclaw Draw, and it appears from the testimony of Mr. Keyes and Mr. Nering that two competent geologists have reached different conclusions based essentially on the same information and that it all amounts to nothing more than speculation as to what the well in this particular section will or will not be able to do.

We believe that there are two alternatives. One would be for the Commission on its own motion to re-examine the spacing for the entire Catclaw Draw - Morrow and not simply to single out Section 3 and determine whether that in fact is or is not part of the Catclaw Draw - Morrow.

The type of testimony used by Texas Pacific with regards to Section 3 is certainly equally applicable to some five other sections within the Catclaw Draw - Morrow, and to exclude Section 3 or any other section without the drilling of the well on Section 3 seems to me to be inappro-

priate. The other solution we would suggest rather than re-examining the entire Catclaw Draw - Morrow, would be simply to deny the application of Texas Pacific, grant Belco's forced pooling application, allow us to drill that well, and then we will know and have the information available to determine how they should be spaced.

MR. CAMPBELL: Briefly, Mr. Examiner, I made a statement at the opening of Case 6046, I think is still applicable.

We believe that a review of the history of the spacing rules and special pool rules for the Catclaw Draw - Morrow Formation will indicate that the Commission has been reluctant to extend 640 spacing beyond the clearly delineated limits of the pool. We believe that we've shown by more than substantial evidence that there is a delineation of the pool now in the southwest corner of that pool and which up to this time has not been determinable. We believe that the dry holes evidence the limit of the pool. We believe we've shown that Section 3 cannot drain 640 acres. We believe that our calculation on those drainage estimates are more substantial and more current than the information provided by Mr. Kellahin in the previous case.

We simply believe, Mr. Examiner, that Texas Pacific has a good shot at a gas well in the western half of Section 3; that Belco, through some machination is attempting to ob-

tain a half interest in that well on our side of the section, and they're trying to do that by forced pooling with 640 acreage, and we just don't believe it's equitable. We don't believe that a conclusion resulting in that determination can be upheld when considering the evidence we've presented and the history of the Catclaw Draw Morrow Gas Pool rules and regulations, and I would add only in closing that if the Commission does order the forced pooling, that we would like to have the opportunity to become operator; that we in no manner concede the appointment of Belco as an operator and we would review all this presentation as something different arguing on risk factors and appointment of operator, and we'd like to have the opportunity to come back in should the Commission decision be to force pool this section.

MR. NUTTER: In other words, in the event the Commission should deny the application of Texas Pacific here and grant the pooling application to Belco, you would want to reopen the forced pooling case and argue for the designation of TP as the operator of the well rather than Belco? In the event that the lands were pooled.

MR. CAMPBELL: Yes, sir, in the event that a compulsory pooling order is issued by the Commission.

MR. KELLAHIN: We would certainly resist that, Mr. Nutter. The hearing on the 28th of September was totally unopposed by Texas Pacific except with regards to spacing.

REPORTER'S CERTIFICATE

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

Sidney F. Morrish, C.S.R.

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

New Mexico Oil Conservation Commission, Examiner

They made no effort to object to the risk factor, to the problem of supervision while drilling or after drilling or any other part of that case and that record is complete and ready for a decision.

MR. CAMPBELL: Mr. Examiner, I would mention that there were some procedural difficulties with this case. We have viewed both the previous case, Case 6046 and this case, Case 6067, as presenting the Commission with an opportunity to determine whether Section 3 should be in the Catclaw Draw. We in no manner --we attempted to consolidate these hearings and it was my early understanding that that motion had been denied. It was my later understanding that it had not been ruled on. We certainly believe that the issue of appointment of operator and proportion of risk is still open for the Commission and we would ask the Commission and the Examiner to recognize in that light the procedural difficulties that we've had in attempting to bring this case to issue.

MR. NUTTER: I think both cases are still open actually. They're going to close here in about thirty seconds though, but I think they're both open at this present time. I don't know what final disposition of either case, of course, will be, but we'll give everybody due consideration.

We'll take the case under advisement and the hearing is adjourned.

(Hearing concluded.)

OIL CONSERVATION COMMISSION

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

DIRECTOR
JOE D. RAMEY

LAND COMMISSIONER
PHIL R. LUCERO

STATE GEOLOGIST
EMERY C. ARNOLD

December 27, 1977

Re: CASE NO. 6067
ORDER NO. R-5599

Mr. Mike Campbell
Campbell, Bingaman & Black
Attorneys at Law
Post Office Box 2208
Santa Fe, New Mexico

Applicant:

Texas Pacific Oil Co., Inc.

Dear Sir:

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

Yours very truly,

JOE D. RAMEY
Director

JDR/fd

Copy of order also sent to:

Hobbs OCC x
Artesia OCC x
Aztec OCC

Other Tom Kellahin

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. 6067
Order No. R-5599

NOMENCLATURE

APPLICATION OF TEXAS PACIFIC OIL
CO., INC., FOR POOL CONTRACTION AND
EXTENSION, EDDY COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on October 12, 1977, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 27th day of December, 1977, 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, Texas Pacific Oil Co., Inc., is the owner of an oil and gas lease covering the W/2 of Section 3, Township 22 South, Range 25 East, NMPM, Catclaw Draw-Morrow Gas Pool, Eddy County, New Mexico.

(3) That Belco Petroleum Corporation is the operator, by farmout agreement, of an oil and gas lease covering the E/2 of Section 3, Township 22 South, Range 25 East, NMPM, Catclaw Draw-Morrow Gas Pool, Eddy County, New Mexico.

(4) That in Case No. 6046, heard by the above-named examiner on September 28, 1977, Belco Petroleum Corporation seeks an order from the Commission pooling all mineral interests in the Morrow formation underlying all of Section 3, Township 22 South, Range 25 East, NMPM, Catclaw Draw-Morrow Gas Pool, Eddy County, New Mexico, to form a standard 640-acre spacing and proration unit for said pool to be dedicated to a well Belco proposes to drill in the SW/4 of said Section 3.

(5) That in the instant case, Texas Pacific Oil Co., Inc., seeks an order from the Commission deleting all of the aforesaid Section 3 from the horizontal boundaries of the Catclaw Draw-Morrow Gas Pool and extending the horizontal boundaries of the Revelation-Morrow Gas Pool in Sections 4 and 9 of Township 22 South, Range 25 East, NMPM, Eddy County, New Mexico, to include said Section 3.

(6) That the Revelation-Morrow Gas Pool is spaced one well to each 320 acres, and Texas Pacific proposes to dedicate the W/2 of the aforesaid Section 3 to a Morrow gas well it proposes to drill in the SW/4 of said Section 3.

(7) That the records in Cases Nos. 6046 and 6067 were consolidated by the examiner but a separate order should be entered in each case.

(8) That the Catclaw Draw-Morrow Gas Pool was created and defined by Commission Order No. R-4157 dated June 21, 1971, which order also established 640-acre spacing for said pool on a temporary basis pending development of additional reservoir information.

(9) That the 640-acre spacing rules for said pool were extended for a period of one year by Commission Order No. R-4157-A dated September 13, 1973, and were extended indefinitely by Commission Order No. R-4157-B dated October 22, 1974, with the specific provision that the rules should apply only to wells within the defined limits of the pool and not, as is often the case in other pools, to the pool limits and to lands outside said limits but within one mile thereof.

(10) That the aforesaid limitation to the application of the pool rules was "...to avoid conflicts of spacing patterns and violation of correlative rights," inasmuch as the Catclaw Draw-Morrow Gas Pool was being developed on 640-acre spacing and "...the drilling of Pennsylvanian gas wells on the standard Southeast New Mexico spacing of 320 acres (was) occurring in lands offsetting the established limits of the...pool but outside the productive limits of the pool."

(11) That in an effort to protect correlative rights by finding the appropriate line of juxtaposition for the meeting of two different spacing patterns, i.e., 320-acre spacing and 640-acre spacing, the Commission entered Order No. R-4861 effective November 1, 1974, and Order No. R-4887, also effective November 1, 1974, extending the Catclaw Draw-Morrow Gas Pool in several places, including all of Section 3, Township 22 South, Range 25 East, NMPM.

(12) That some of the aforesaid extensions were predicated upon the completion of Morrow gas wells the characteristics of which indicated that they were in fact completed in the Catclaw Draw-Morrow Gas Pool, but others of said extensions were based

upon the Commission's interpretation of the best geological information available at the time.

(13) That the extension of the Catclaw Draw-Morrow Gas Pool to include the aforesaid Section 3 was based upon such geological information inasmuch as the nearest production from the Catclaw Draw Pool was from a well in the SE/4 SW/4 of Section 35, Township 21 South, Range 25 East, NMPM.

(14) That the geological information at hand when the pool was extended to include Section 3, Township 22 South, Range 25 East, NMPM, indicated a favorable looking Morrow structure extending from Sections 23, 26, and 35 of Township 21 South, Range 25 East, NMPM, where producing Morrow gas wells were located, into Sections 27 and 34 of Township 21 South, Range 25 East, NMPM, and Section 3, Township 22 South, Range 25 East, NMPM.

(15) That subsequent to the extension of the pool to include, among other lands, the aforesaid Section 3, non-productive Morrow wells have been drilled in Sections 27 and 34, Township 21 South, Range 25 East, and in Section 2, Township 22 South, Range 25 East, NMPM.

(16) That this subsequent development and the attendant additional geological information would appear to indicate that the favorable looking Morrow structure described in Finding No. (14) above is either non-existent, or of a different configuration than originally thought, or is non-productive of gas from the Catclaw Draw-Morrow Gas Pool.

(17) That a non-productive belt in the Morrow formation appears to run in a north-south direction through the east half of Sections 27 and 34, Township 21 South, Range 25 East, NMPM, thence southeasterly across Section 2, Township 22 South, Range 25 East, NMPM, thereby effectively separating Section 3 of Township 22 South, Range 25 East, NMPM, from the Catclaw Draw-Morrow Gas Pool.

(18) That the aforesaid non-productive belt constitutes a reasonable and logical line of juxtaposition for the meeting of two different spacing patterns, and in order to prevent waste and protect correlative rights, the Catclaw Draw-Morrow Gas Pool should be contracted by the deletion therefrom of all of Section 3, Township 22 South, Range 25 East, NMPM.

(19) That while there is another productive Morrow structure to the south and west of said Section 3, and the Commission has heretofore created and defined the Revelation-Morrow Gas Pool to include portions of said structure, and it appears that said structure extends north and east into said Section 3, it would be premature for the Commission to extend the Revelation-Morrow Gas Pool into said Section 3 at this time.

(20) That the application of Texas Pacific Oil Co., Inc., for the extension of the Revelation-Morrow Gas Pool should be denied.

IT IS THEREFORE ORDERED:

(1) That the Catclaw Draw-Morrow Gas Pool, Eddy County, New Mexico, as heretofore classified, defined, and described, is hereby contracted by the deletion of the following described lands:

TOWNSHIP 22 SOUTH, RANGE 25 EAST, NMPM
Section 3: All

(2) That the application of Texas Pacific Oil Co., Inc., for the extension of the Revelation-Morrow Gas Pool is hereby denied.

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

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

PHIL R. LUCERO, Chairman

EMERY C. ARNOLD, Member

JOE D. RAMEY, Member & Secretary

S E A L

jr/

CASE 6065: Application of Odessa Natural Corporation for a special well classification, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks the classification of its ARCO-Little Fed. Well No. 1, located in Unit D of Section 32, Township 24 North, Range 3 West, Rio Arriba County, New Mexico, as a gas well rather than an oil well, thereby permitting the continued dedication of the W/2 of said Section 32. Said classification would be in exception to the statewide definition of gas wells, or to the Chacon-Dakota Associated Pool definition of gas wells, whichever is applicable.

CASE 6066: Application of Texas Pacific Oil Company, Inc., for an unorthodox gas well location and simultaneous dedication, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of its State "A" A/c-1 Well No. 53 located in the center of Unit E of Section 24, Township 23 South, Range 36 East, Jalmat Gas Pool, Lea County, New Mexico, to be simultaneously dedicated to a previously approved 480-acre multiple well non-standard proration unit comprising the NW/4 and S/2 of said Section 24.

CASE 6067: Application of Texas Pacific Oil Co., Inc., for pool contraction and extension, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the contraction of the Catclaw Draw-Morrow Gas Pool, Eddy County, New Mexico, by the deletion of Section 3, Township 22 South, Range 25 East, therefrom, and the extension of the Revelation-Morrow Gas Pool to include said lands.

CASE 6068: In the matter of the hearing called by the Oil Conservation Commission upon its own motion for the creation and extension of certain pools in San Juan, Rio Arriba and Sandoval Counties, New Mexico:

(a) CREATE a new pool in San Juan County, New Mexico, classified as a gas pool for Fruitland production and designated as the Conner-Fruitland Pool. The discovery well is the Odessa Natural Corporation Little Federal Well No. 1 located in Unit K of Section 1, Township 30 North, Range 14 West, NMPM. Said pool would comprise:

TOWNSHIP 30 NORTH, RANGE 14 WEST, NMPM	
Section 1:	W/2
Section 12:	W/2

(b) CREATE a new pool in San Juan County, New Mexico, classified as a gas pool for Pictured Cliffs production and designated as the South Gallegos-Pictured Cliffs Pool. The discovery well is the Jerome P. McHugh Nassau Well No. 5 located in Unit A of Section 36, Township 27 North, Range 12 West, NMPM. Said pool would comprise:

TOWNSHIP 27 NORTH, RANGE 12 WEST, NMPM	
Section 36:	All

(c) EXTEND the Ojo-Pictured Cliffs Pool in San Juan County, New Mexico, to include therein:

TOWNSHIP 28 NORTH, RANGE 15 WEST, NMPM	
Section 25:	S/2 & NW/4
Section 26:	All
Section 35:	N/2 & SE/4
Section 36:	All

and to extend the vertical limits of said pool to include the Fruitland formation and redesignate said pool the Ojo Fruitland-Pictured Cliffs Pool.

(d) EXTEND the WAW-Pictured Cliffs Pool in San Juan County, New Mexico, to include therein:

TOWNSHIP 26 NORTH, RANGE 13 WEST, NMPM	
Section 4:	NW/4

TOWNSHIP 27 NORTH, RANGE 13 WEST, NMPM	
Section 26:	SW/4
Section 27:	SE/4
Section 29:	All
Section 30:	E/2
Section 31:	All
Section 32:	N/2 & SW/4
Section 33:	All
Section 34:	N/2 & SW/4

and to extend the vertical limits of said pool to include the Fruitland formation and redesignate said pool the WAW Fruitland-Pictured Cliffs Pool.

(e) EXTEND the Ballard-Pictured Cliffs Pool in Rio Arriba and Sandoval Counties, New Mexico, to include therein:

CATCLAW DRAW FIELD (MORROW)

T21S -Rge. 25&26E

EDDY COUNTY, NEW MEXICO

SUMMARY OF RESERVES & ESTIMATED DRAINAGE AREA

Well No.	Sec. Location	Recoverable Res. MMCF	Avg. Rec. G.I.P. MCF/Ac-ft	Est. Avg. Net Pay - Over Spacing Unit	Drainage Area Acres
2	23	11.25	546	20.2'	1020
4	24	11.40	546	21.0'	994
6	13	3.95	546	14.2'	509
7	14	4.10	546	15.6'	481
9	35	10.72	546	26'	755
	TOTALS...	40.42	546	19.4'	3759

AVERAGE DRAINAGE AREA PER WELL = 752 Acres.

Case No. 4548
(2nd Re-opened)
Inexco
Exhibit 1
9-4-74

CATCLAW DRAW FIELD (MORROW)

T21S - Rge. 25&26E

EDDY COUNTY, NEW MEXICO

SUMMARY OF ROCK PROPERTIES BY ZONE

Well No.	Perforated Zone					
	"C"			"D"		
	Ø	Net Pay ft	S_w %	Ø	Net Pay ft	S_w %
#2	12	14	34.7	11.3	12	39
#4	8.3	12	37	9.5	19	24
#6	7.3	7	40	8	4	44
#7	6.2	10	30	9	13	41.2
#9	-	-	-	-	26	-

Weighted Average Rock Properties ("C" and "D" Zones Combined).

Porosity - 9.3%

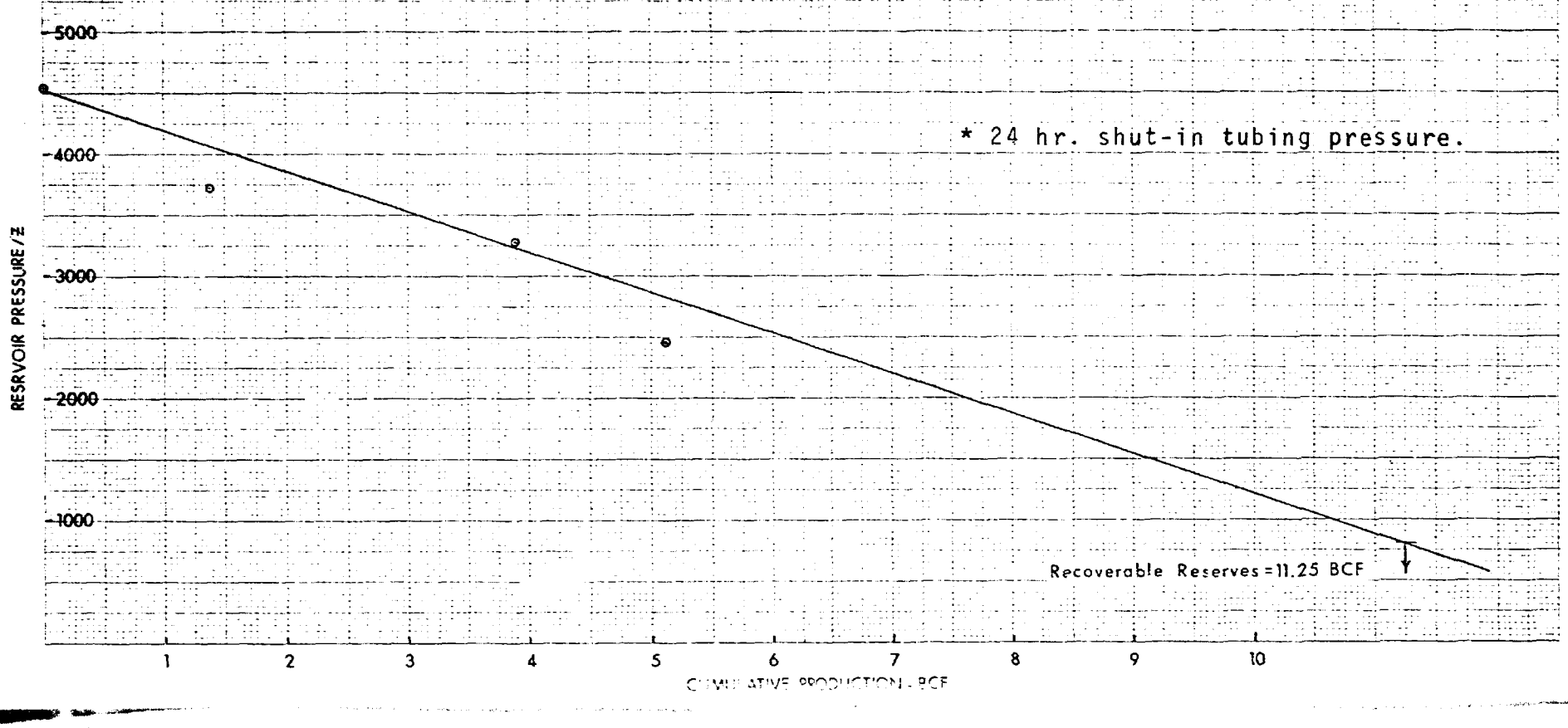
Water Saturation - 34.5%

Gas - In - Place (MCF/Ac-ft) - 663.

Recoverable Gas - In - Place (MCF/Ac-ft) - 546
(Abandonment Pressure $\approx$ 750 psig)

CATCLAW DRAW UNIT NO 2

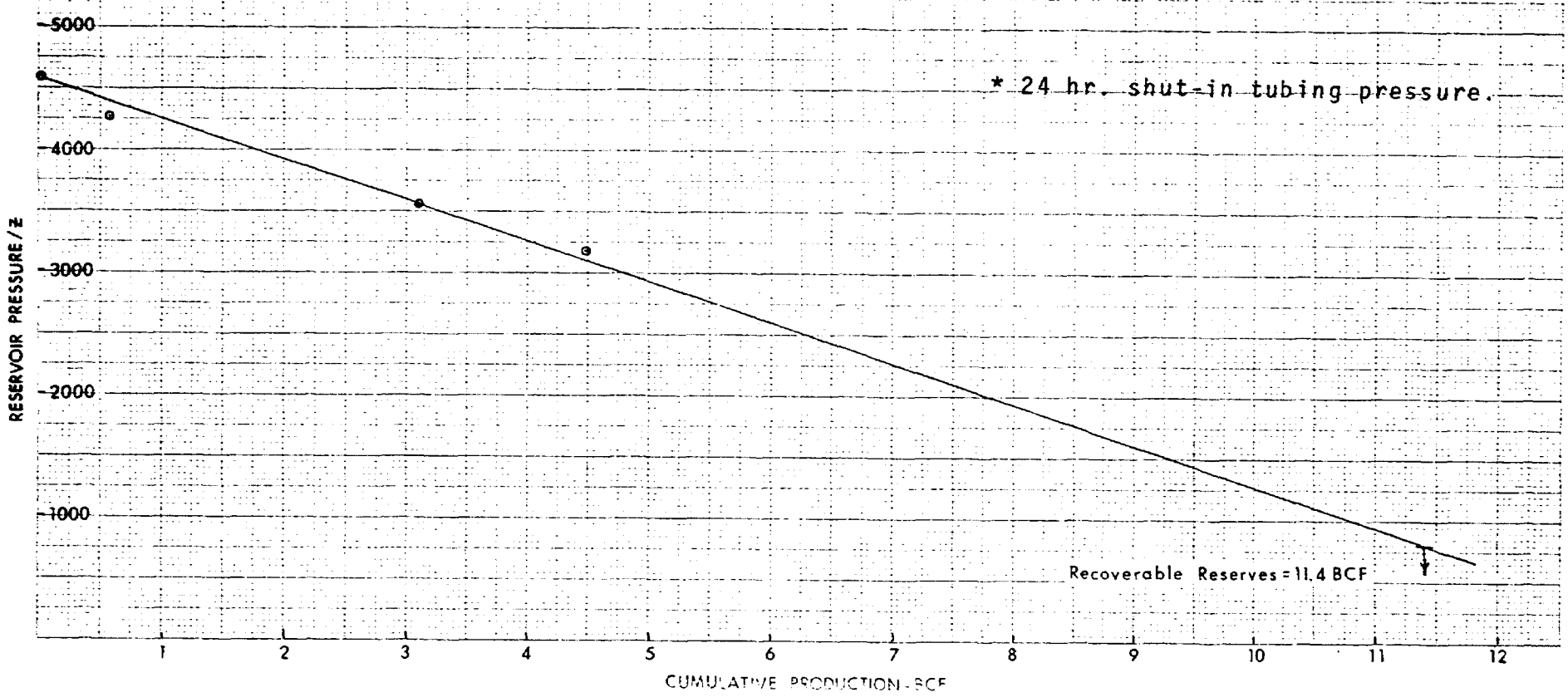
Date	BHP	Cum. Prod'n	Z	BHP/Z
11-71	4397	0	.967	4547
1-73	3432	1.267 BCF	.919	3734
2-74	2952	3.904 BCF	.896	3294
* 8-74	2186	5.119 BCF	.888	2460



10 X 10 TO THE CENTIMETER 46 1510

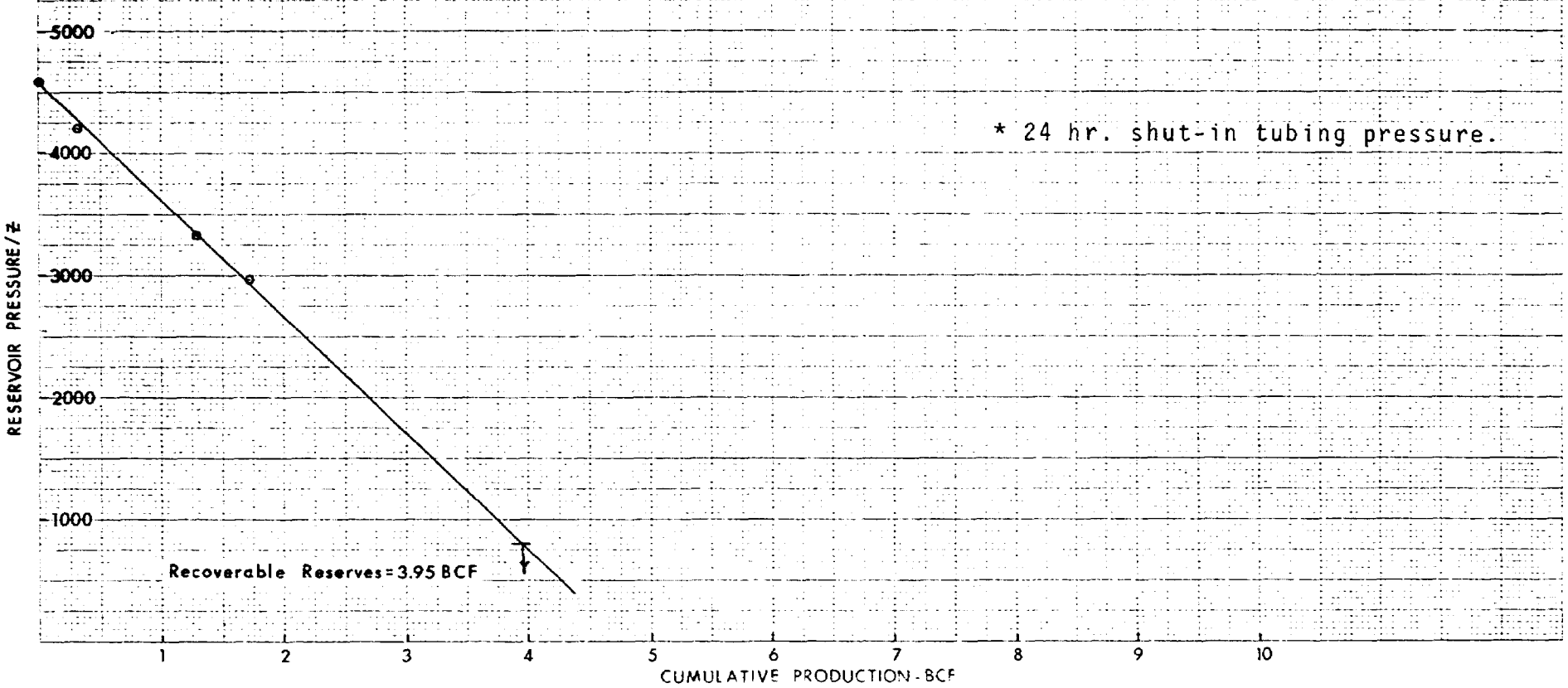
CATCLAW DRAW UNIT NO 4

Date	BHP	Cum Prod'n	Z	BHP/Z
8-72	4434	0	.97	4571
1-73	3978	.634 BCF	.934	4259
2-74	3238	3.115 BCF	.906	3574
*8-74	2787	4.494	.877	3177



CATCLAW DRAW UNIT NO 6

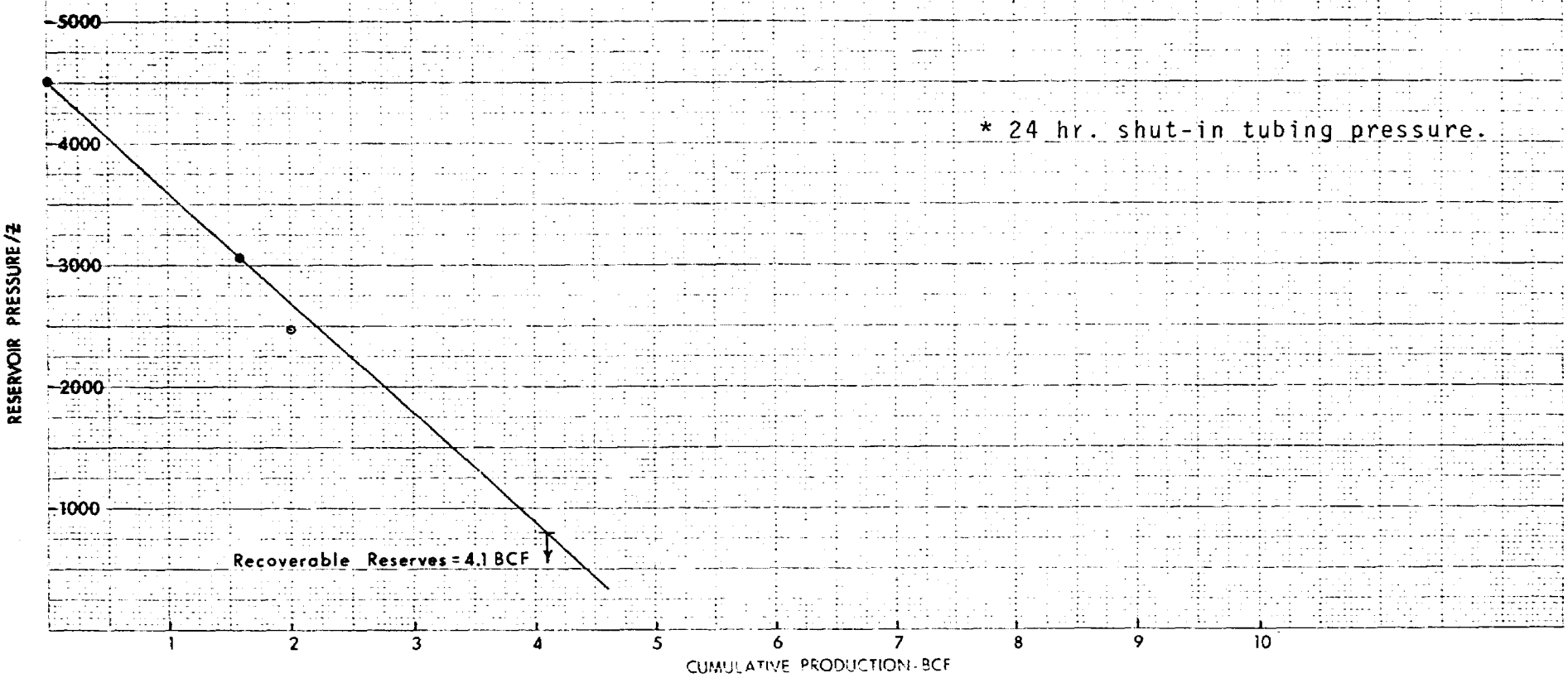
Date	BHP	Cum. Prod'n	Z	BHP/Z
10-72	4428	0	.97	4565
1-73	3920	.307 BCF	.934	4197
2-74	2979	1.287 BCF	.898	3317
*8-74	2613	1.722	.883	2960



* 24 hr. shut-in tubing pressure.

CATCLAW DRAW UNIT NO 7

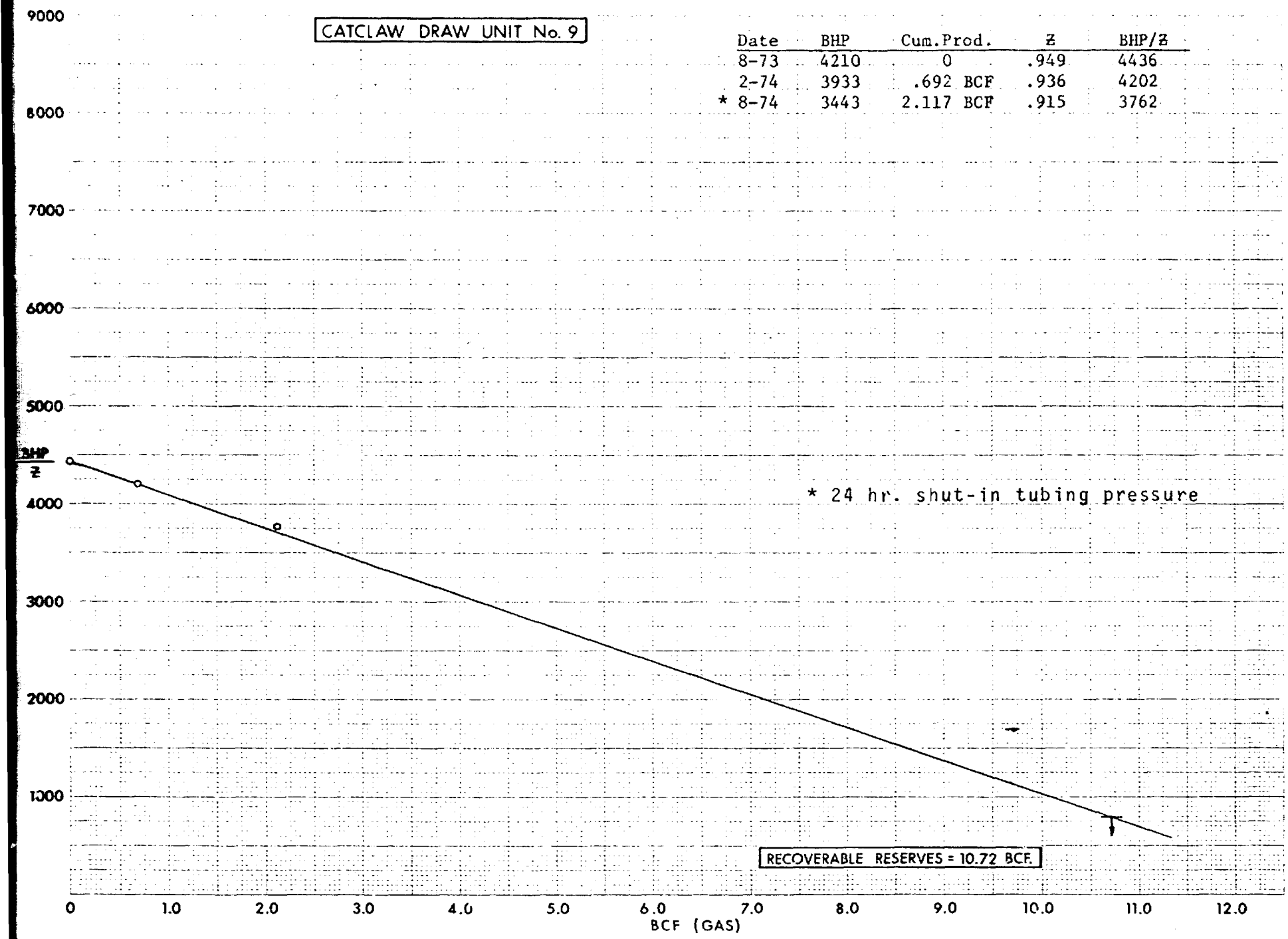
Date	BHP	Cum. Prod'n	Z	BHP/Z
11-72	4280	0	.95	4505
2-74	2737	1.572 BCF	.894	3061
* 8-74	2188	2.023	.884	2474



* 24 hr. shut-in tubing pressure.

CATCLAW DRAW UNIT No. 9

Date	BHP	Cum.Prod.	Z	BHP/Z
8-73	4210	0	.949	4436
2-74	3933	.692 BCF	.936	4202
* 8-74	3443	2.117 BCF	.915	3762



PLOT SYMBOLS: WHSIP = O, BHP/Z = Z, Common = C

6 MOS TOTAL MMCF/6 = R (RATE/CUM SCALE ON RIGHT SIDE)

TEMP GRAD: 1.117

419

221525801P00PM 1P 21S 25E DAVID FASKEN AVALON FEDERAL COM 1

STATE	FIELD NUMBER	FIELD NAME		RESERVOIR	STATUS		LIQUID	API NO.
NEW MEXICO	80108000	CATCLAW DRAW MORROW (GAS)	PM		ACT	GNM		20306

DIST. NO.	COUNTY OR PARISH	DATE COMP.	DATE 1ST PROD.	GAS GRAVITY	INIT. TEST DATE	INIT. POTENTIAL	INIT. WHSIP	LATEST S.I.P.	INIT. BHP/Z	M C	TOTAL DEPTH	PERFORATIONS	LIQUID GRAVITY	WELLHEAD TEMPERATURE, PRESSURE AT END OF TEST
2	EDDY	090970	09-72	.60	090870	2725	2588	.885	3559	C	10582	10314-10349		

PERIOD ENDING	MCF LAST SIX MONTHS	MCF YEARLY PRODUCTION	MMCF CUMULATIVE PRODUCTION	MMCF CUMULATIVE AT TEST	TEST DATE	POTENTIAL	WHSIP	BHP	M C	BHP/Z	TEST W.H. BBLS/DAY	MCF W.H.P. INIT. WHSIP	SIX MONTH WATER PROD.	SIX MONTH COND. PROD.	SIX MONTH DISPOSITION
7-72			542											123	23
1-73	54203	54203													
7-73	30898		851											2	1
1-74	16664	47562	1018												
7-74	11800		1136											13	11
1-75	7247	19047	1208	1154	08-06-74		795	986	C	1049		64			
7-75	4029		1248												
1-76	10436	14465	1353	1266	09-09-75		791	981	C	1044		71		7	7
7-76	11606		1469												
1-77	9084	20690	1560	1472	07-07-76		1265	1583	C	1730		111			

PRESSURE

4000
3600
3200
2800
2400
2000
1600
1200
800
400
0

(P/Z)i = 3560

IGIP = .29BCF

0.05 0.10 0.15 0.20 0.25 0.30 0.35 0.40 0.45 0.50 0.55 0.60

BCF-PRESSURE →
BCF-RATE →

Cutter

1

Applicant
10/12/1976

(1)

WRIGHT'S

5618 DANIELS DALLAS, TEXAS 75206

PLOT .50 SYMBOLS: WHSIP = O, BHP/Z = Z, Common = C

429

6 MOS TOTAL MMCF/G = R
(RATE/CUM SCALE ON RIGHT SIDE)
TEMP GRAD: 1.117

221S25E36DOOPM36D 21S 25E HANAGAN PETROLEUM CORPOR CATCLAW DRAW UNIT — 3

STATE	FIELD NUMBER	FIELD NAME	RESERVOIR	STATUS	GAS	LIQUID	API NO.
NEW MEXICO	8010800	CATCLAW DRAW MORROW (GAS) PM		INA	GNM	NCO	

WELL NO.	COUNTY OR PARISH	DATE COMP.	DATE 1ST PROD.	GAS GRAVITY	INIT. TEST DATE	INIT. POTENTIAL	INIT. WHSIP	LATEST S.I.P.	INIT. BHP/Z	P/C	TOTAL DEPTH	PERFORATIONS	LIQUID GRAVITY	WELLHEAD FLOWING PRESSURE AT TIME OF TEST
2	EDDY	080772	10-72	.61	073072	5000	3267	.850	4310	C	10933	10810-10826		

PERIOD (MM/YY)	MCF LAST SIX MONTHS	MCF YEARLY PRODUCTION	MMCF CUMULATIVE PRODUCTION	MMCF CUMULATIVE AT TEST	TEST DATE	POTENTIAL	WHSIP	BHP	M C	BHP/Z	TEST W H PRESS/DAY	MCF/DROP INIT. WHSIP	SIX MONTH WATER PROD.	SIX MONTH COND. PROD.	SIX MONTH BBLS/MCF
7-72			497											124	25
1-73	49667	49667												3	14
7-73	2108		518												
1-74		2108	518	518	08-17-73		1512	1928	C	2130		30			
7-74			518												
1-75			518	518	10-21-74		2128	2730	C	3030		46			

PRESSURE

(P/Z)i = 4300

IGIP = .178 CF

(2)

BCF-PRESSURE →
BCF-RATE →

RATE MMCF

PLOT SYMBOLS: WHSIP = O, BHP/Z = Z, Common = C

6 MOS TOTAL MMCF/6 = R

(RATE/CUM SCALE ON RIGHT SIDE)

TEMP GRAD: NONE

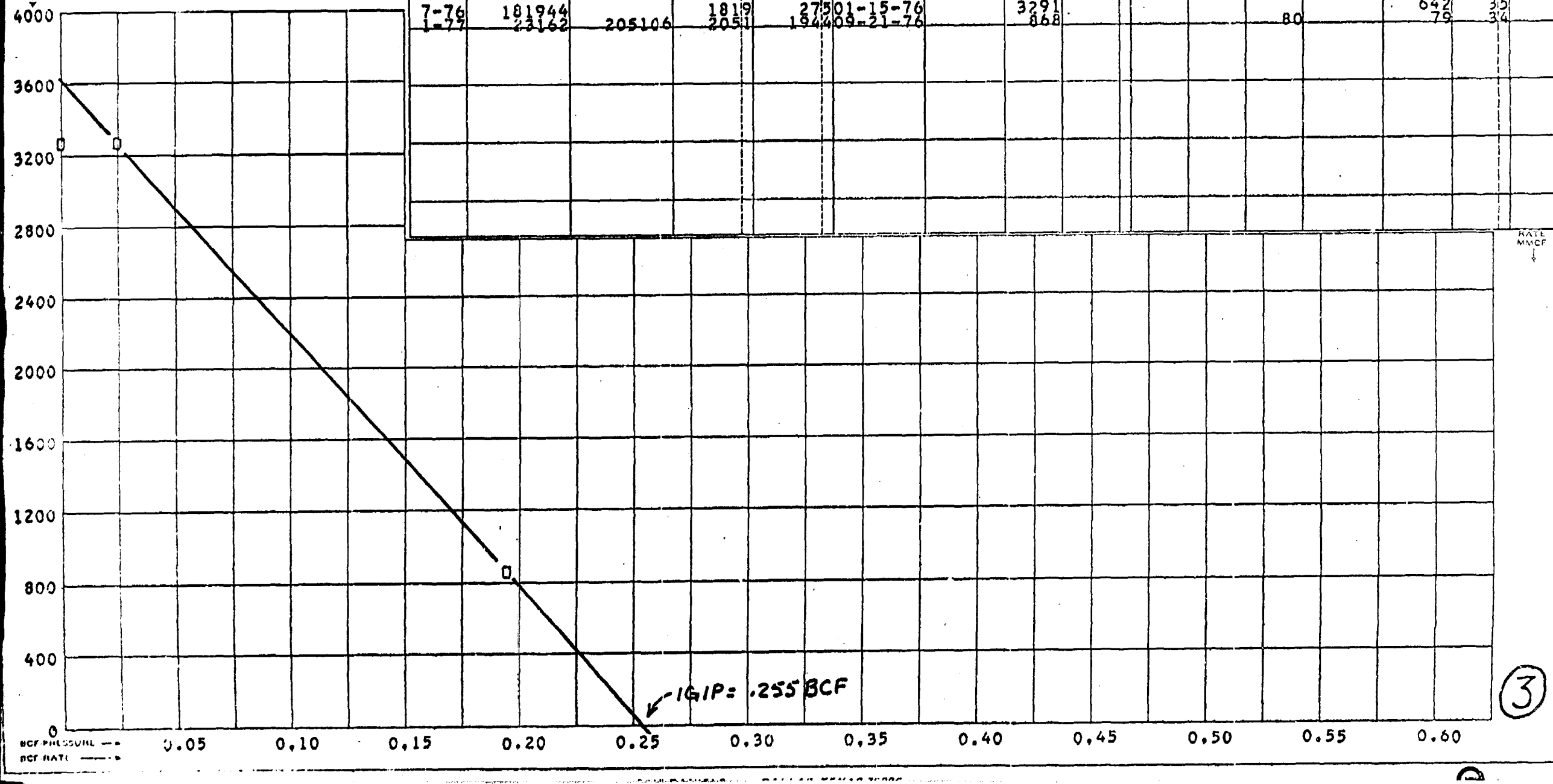
250 430

COMPLETION NUMBER	LOCATION	OPERATOR	WELL NAME	WELL NO.
221S25E36L00PM36	21S 25E	HANAGAN PETROLEUM CORPOR	CATCLAW DRAW UNIT	11

STATE	FIELD NUMBER	FIELD NAME	RESERVOIR	STATUS	GAS GATHERER	LIQUID	API NO.
NEW MEXICO	8010800	CATCLAW DRAW MORROW (GAS) PM		ACT	L I		21517

UNIT NO.	COUNTY OR PARISH	DATE COMP.	DATE 1ST PROD.	GAS GRAVITY	INIT. TEST DATE	INIT. POTENTIAL	INIT. WHSIP	LATEST N FAC.	INIT. BHP/Z	M C	TOTAL DEPTH	PERFORATIONS	LIQUID GRAVITY	WELLHEAD FLOWING PRESSURE AT END OF TEST
2	EDDY	090275	01-76	.60	082675	4940	3291	.773			11170	10935-10974		

PERIOD ENDING	MCF LAST SIX MONTHS	MCF YEARLY PRODUCTION	MMCF CUMULATIVE PRODUCTION	MMCF CUMULATIVE AT TEST	TEST DATE	POTENTIAL	WHSIP	BHP	M C	BHP/Z	TEST W/R BBLS/DAY	MCF/DROP INIT. WHSIP	SIX MONTH WATER PROD.	SIX MONTH COND PROD.	SIX MONTH BBLS/MMCF
7-76	181944	205106	1819	275	01-15-76		3291							642	35
1-77	23162		2051	194	09-21-76		868					80		79	34



(3)

PLOT C50 SYMBOLS: WHSIP = O; BHP/Z = Z; Common = C

6 MOS TOTAL MMCF/6 = R (RATE/CUM SCALE ON RIGHT SIDE)

TEMP GRAD: 1.117

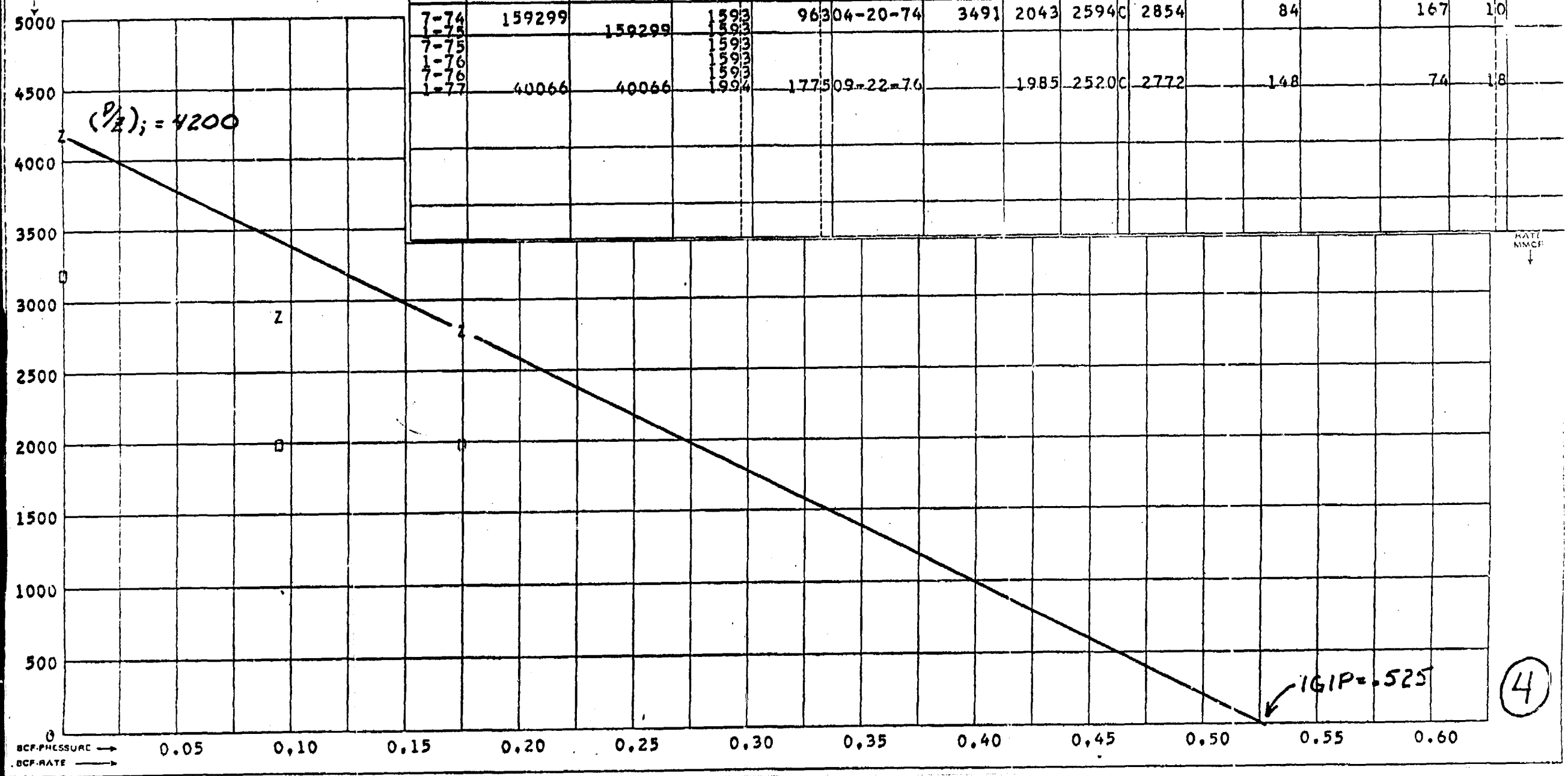
434

WELL DIRECTORY NUMBER	SEC-TWP-RGE LOCATION	OPERATOR	WELL NAME	WELL #
221526E20D00PM20D 21S 26E		HANAGAN PETROLEUM CORPOR	ARCO FEDERAL COM	1

STATE	FIELD NUMBER	FIELD NAME	RESERVOIR	STATUS	GAS GATHERER	LIQUID GATHERER	API NO.
NEW MEXICO	80108000	CATCLAW DRAW MORROW (GAS) PM		ACT	GNM	NCO	

DIST. NO.	COUNTY OR PARISH	DATE COMP.	DATE 1ST PROD.	GAS GRAVITY	INIT. TEST DATE	INIT. POTENTIAL	INIT. WHSIP	LATEST N.F.A.C.	INIT. BHP/Z	M/C	TOTAL DEPTH	PERFORATIONS	LIQUID GRAVITY	WELLHEAD FLOWING PRESSURE AT END OF TEST
2	EDDY	101373	02-74	.59	100973	8299	3186	.678	4180	C	11050	10908-10923	45.9	

PERIOD ENDING	MCF LAST SIX MONTHS	MCF YEARLY PRODUCTION	MMCF CUMULATIVE PRODUCTION	MMCF CUMULATIVE AT TEST	TEST DATE	POTENTIAL	WHSIP	BHP	M/C	BHP/Z	TEST VOL BBLS/DAY	MCF/DROP INIT. WHSIP	SIX MONTH WATER PROD.	SIX MONTH COND. PROD.	SIX MONTH BBLS/MMCF
7-74	159299		1593	963	04-20-74	3491	2043	2594	C	2854		84		167	10
1-75		159299	1593												
7-75			1593												
1-76			1593												
7-76			1593												
1-77	40066	40066	1994	1775	09-22-76		1985	2520	C	2772		148		74	18



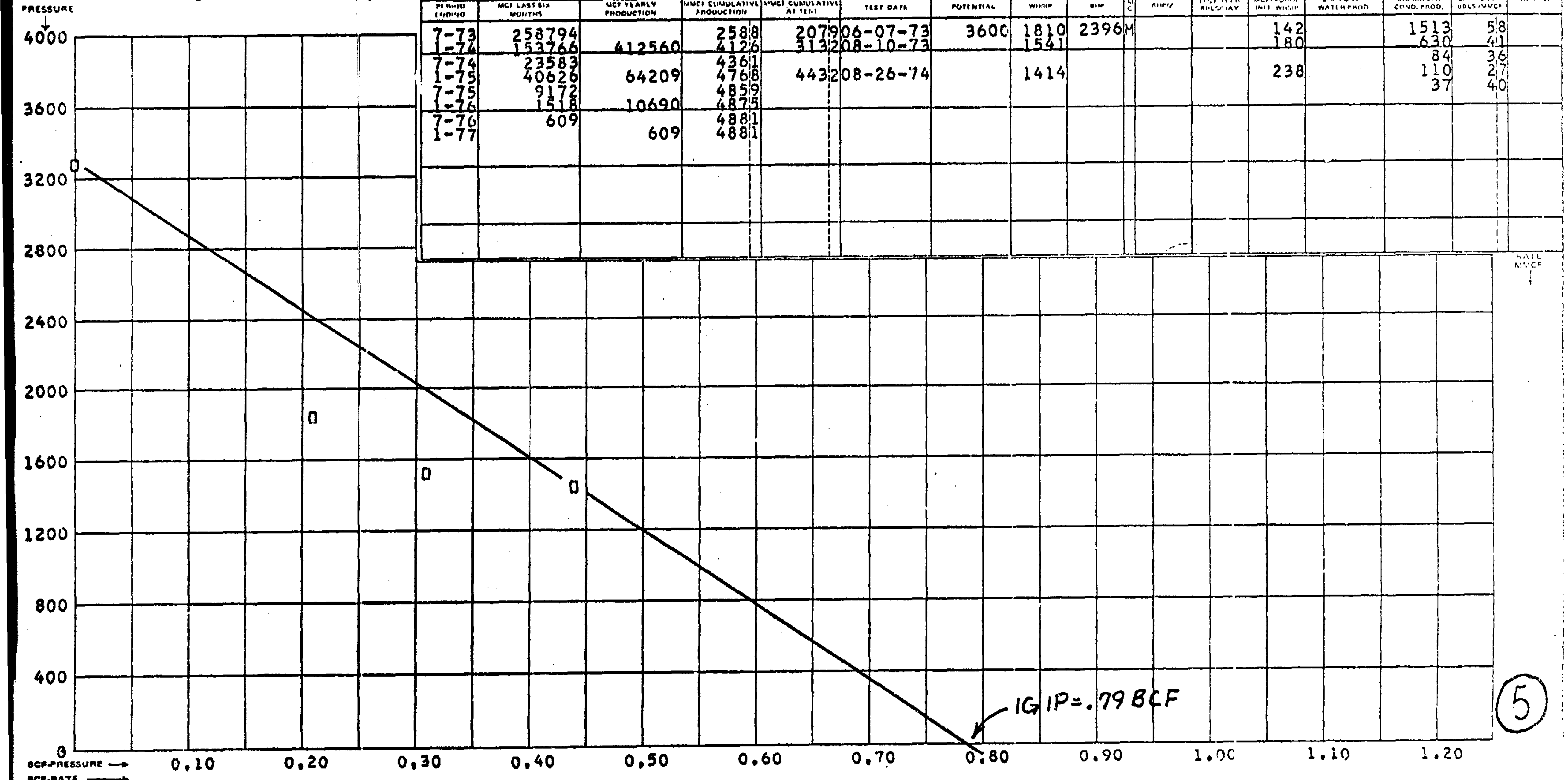
PLOT SYMBOLS:	WHSIP = O	435
	BHP/Z = Z	
	Common = C	
	6 MOS TOTAL MMCF/G = R (RATE/CUM SCALE ON RIGHT SIDE)	
	TEMP GRAD:	1.117

NUMBER / LOCATION	OPERATOR	WELL NAME	WELL NO.
221S26E30FPKPM30F 21S 26E	INEXCO OIL COMPANY	USA BOSCOWITZ COM	1

STATE	FIELD NUMBER	FIELD NAME	RESERVOIR	STATUS	GAS	LIQUID	API NO.
NEW MEXICO	8010800	CATCLAW DRAW MORROW (GAS)	PM	ACT	S U	PER	

DIST. NO.	COUNTY OR PARISH	DATE COMP.	DATE 1ST PROD.	GAS GRAVITY	INIT. TEST DATE	INIT. POTENTIAL	INIT. WHSIP	LATEST N FAC.	TOTAL DEPTH	PERFORATIONS
2	EDDY	020573	04-73		022473	9800	3278	1.000	11075	10804-10820

PERIOD ENDING	MCF LAST SIX MONTHS	MCF YEARLY PRODUCTION	MMCF CUMULATIVE PRODUCTION	MMCF CUMULATIVE AT TEST	TEST DATA	POTENTIAL	WHSIP	BHP	BHP/Z	MCF/BOPD INIT WHSIP	SIX MONTH WATER PROD.	SIX MONTH COND. PROD.	SIX MONTH BBLS/MMCF
7-73	258794		2588	2079	06-07-73	3600	1810	2396M		142		1513	58
1-74	153766	412560	4126	3132	08-10-73		1541			180		630	41
7-74	23583		4361									84	36
1-75	40626	64209	4768	4432	08-26-74		1414			238		110	27
7-75	9172		4859									37	40
1-76	1518	10690	4875										
7-76	609		4881										
1-77		609	4881										



(5)

PLOT SYMBOLS: WHSIP = O; BHP/Z = Z; Common = C

6 MOS TOTAL MMCF/D = R (RATE/CUM SCALE ON RIGHT SIDE)

TEMP GRAD: 1.117

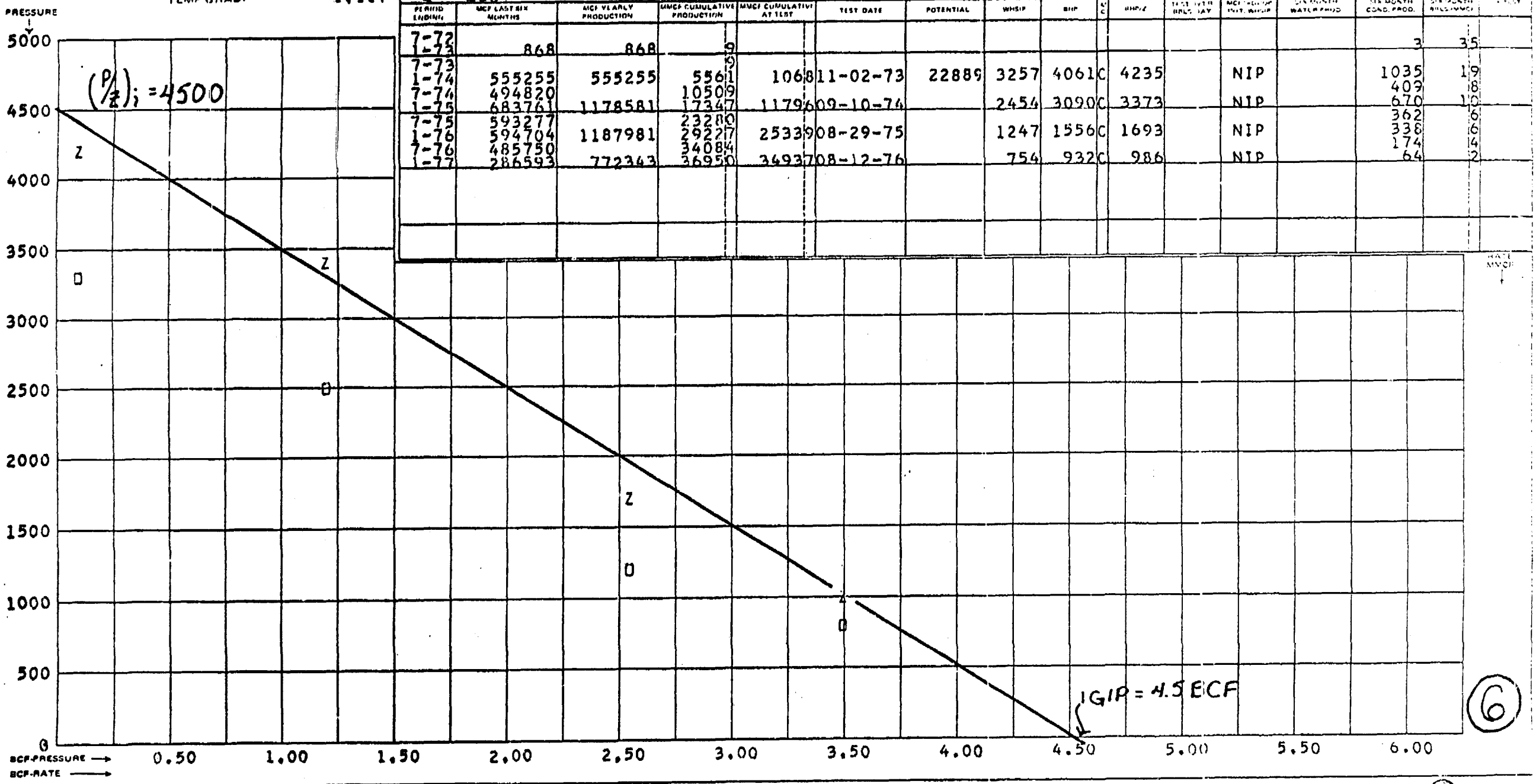
421

LOCATION	OPERATOR	WELL NAME	WELL NO.
22S 25E 12NOOPM 12N 21S 25E	TEXACO INCORPORATED (MDN	E. J. LEVERS FEDERAL NCT-1	1

STATE	FIELD NUMBER	FIELD NAME	RESERVOIR	STATUS	LIQUID	API NO.
NEW MEXICO	8010800	CATCLAW DRAW MORROW (GAS) PM		ACT	GNM	PER

DIST. (m)	COUNTY OR PARISH	DATE COMP.	DATE 1ST PROD.	GAS GRAVITY	INIT. TEST DATE	INIT. POTENTIAL	INIT. WHSIP	LATEST P/Z FAC.	INIT. BHP/Z	T/C	TOTAL DEPTH	PERFORATIONS	LIQUID GRAVITY
2	EDDY	081772	08-72	.59				.746			10645	10453-10507	54.8

PERIOD ENDING	MCF LAST SIX MONTHS	MCF YEARLY PRODUCTION	MMCF CUMULATIVE PRODUCTION	MMCF CUMULATIVE AT TEST	TEST DATE	POTENTIAL	WHSIP	BHP	T/C	BHP/Z	TEST WTR BBLS/DAY	MCF/D OF INIT. WHSIP	SIX MONTH WATER PROD	SIX MONTH COND. PROD.	SIX MONTH BBLS/MMCF
7-72			9											3	35
1-73	868	868	9												
7-73			9											1035	19
1-74	555255	555255	556	1068	11-02-73	22889	3257	4061	C	4235		NIP		409	8
7-74	494820		1050											670	10
1-75	683761	1178581	1734	1179	09-10-74		2454	3090	C	3373		NIP		362	6
7-75	593277		2328											338	6
1-76	594704	1187981	2922	2533	08-29-75		1247	1556	C	1693		NIP		174	4
7-76	485750		3408											64	2
1-77	286593	772343	3695	3493	08-12-76		754	932	C	986		NIP			



(6)

PLOT SYMBOLS: WHSIP = O, BHP/Z = Z, Common = C — 422

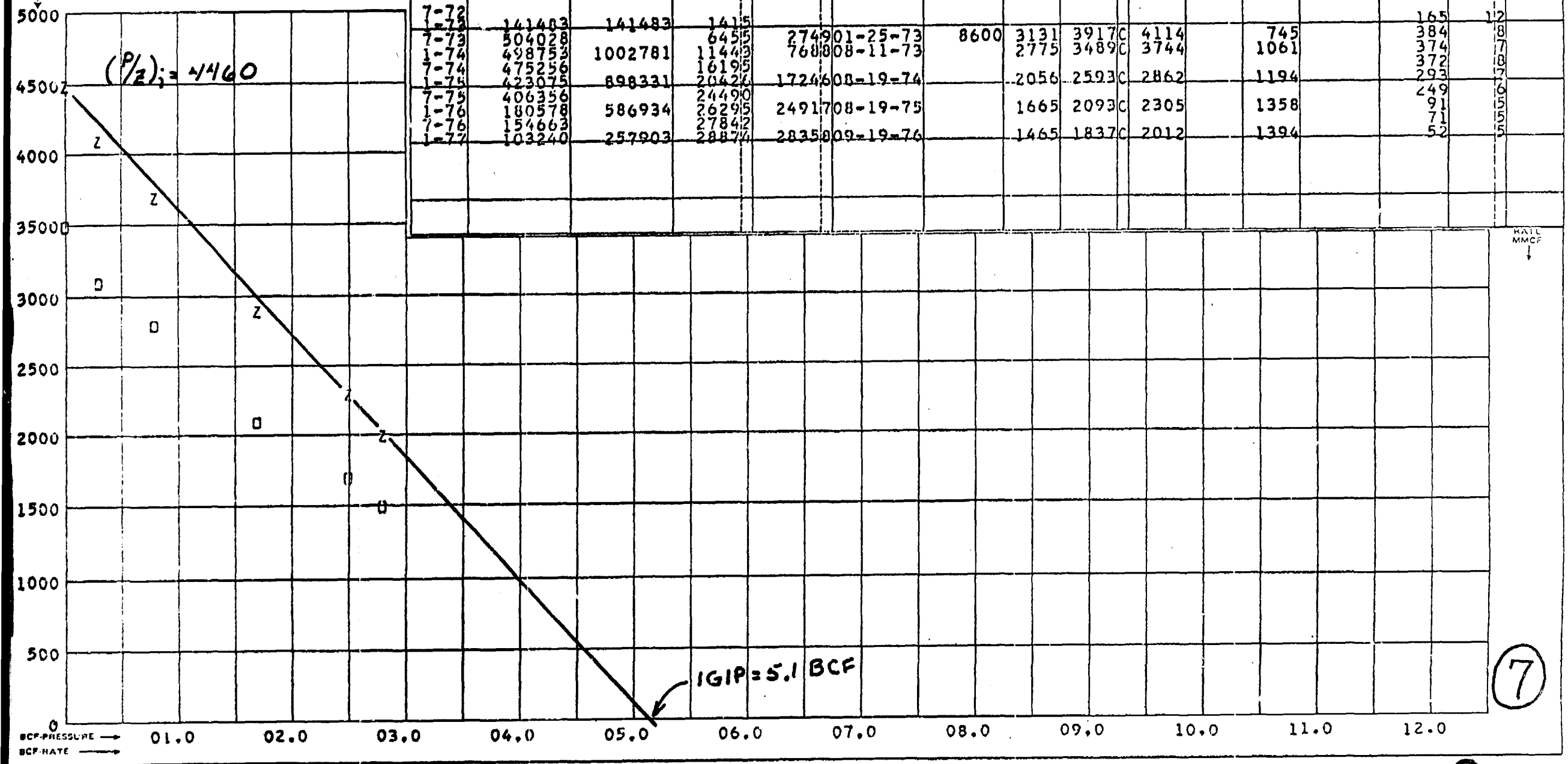
6 MOS TOTAL MMCF/6 = R (RATE/CUM SCALE ON RIGHT SIDE) — TEMP GRAD: 1.117

22	25	13	J	00	PM	13	J	21S	25E	HANAGAN PETROLEUM CORPOR	CATCLAW DRAW UNIT	6

STATE	FIELD NUMBER	FIELD NAME	RESERVOIR	STATUS	GAS GATHERER	LIQUID	API NO.
NEW MEXICO	8010800	CATCLAW DRAW MORROW (GAS) PM		ACT	GNM	NCO	20734

DIST NO.	COUNTY OR PARISH	DATE COMP.	DATE 1ST PROD.	GAS GRAVITY	INIT. TEST DATE	INIT. POTENTIAL	INIT WHSIP	LATITUDE FAC.	INIT. BHP Z	M C	TOTAL DEPTH	PERFORATIONS	LIQUID GRAVITY	RECORDED ECONOMIC PRESSURE AT END OF TEST
2	EDDY	10187	12-72	.59	10187	7750	3500	.752	4455	C	10700	10534-10621		

PERIOD ENDING	MCF LAST SIX MONTHS	MCF YEARLY PRODUCTION	MMCF CUMULATIVE PRODUCTION	MMCF CUMULATIVE AT TEST	TEST DATE	POTENTIAL	WHSIP	BHP	M C	BHP/Z	TEST WTR BBLS/DAY	MCF-DROP INIT WHSIP	SIX MONTH WATER PROD.	SIX MONTH COND. PROD.	SIX MONTH BBLS/MMCF
7-72															
1-73	141483	141483	1415											165	12
7-73	504028		6455	274	01-25-73	8600	3131	3917	C	4114		745		384	8
1-74	498753	1002781	11443	768	08-11-73		2775	3489	C	3744		1061		374	7
7-74	475256		16195											372	8
1-75	423075	898331	20426	1724	08-19-74		2056	2593	C	2862		1194		293	7
7-75	406356		24490											249	6
1-76	180578	586934	26295	2491	08-19-75		1665	2093	C	2305		1358		91	5
7-76	154663		27842											71	5
1-77	103240	257903	28874	2835	09-19-76		1465	1837	C	2012		1394		52	5



7

PLOT SYMBOLS: WHSIP = O, BHP/Z = Z, Common = C

6 MOS TOTAL MMCF/D = R (RATE/CUM SCALE ON RIGHT SIDE)

TEMP GRAD: 1.117

423

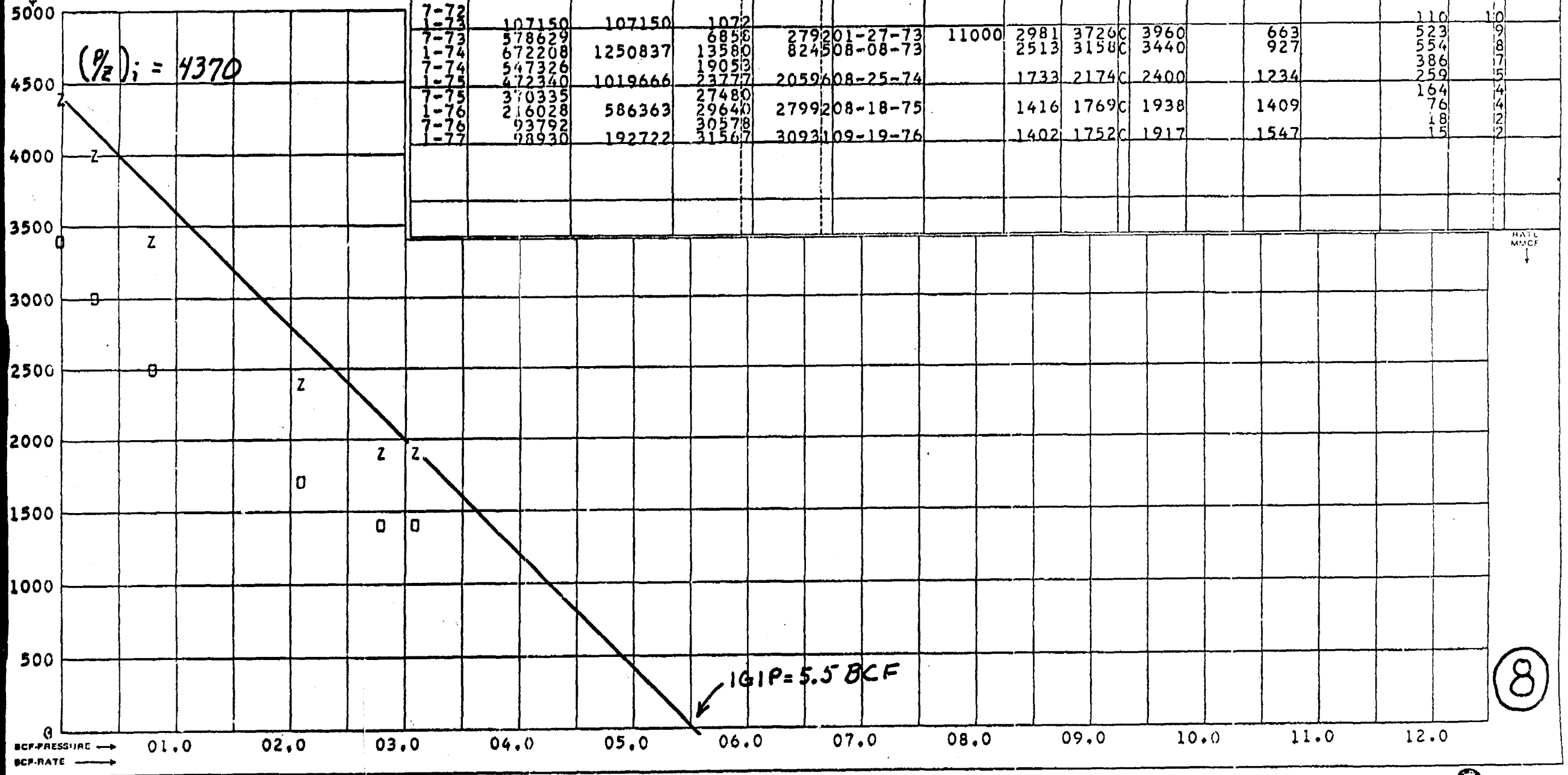
SEC-TWP-RGE	UNIT	LOCATION	OPERATOR	WELL NAME	WELL NO.
27S 25E	14	J00PM 14 J 21S 25E	HANAGAN PETROLEUM CORPOR	CATCLAW DRAW UNIT	7

STATE	FIELD NUMBER	FIELD NAME	RESERVOIR	STATUS	GAS	LIQUID	API NO.
NEW MEXICO	80108000	CATCLAW DRAW MORROW (GAS) PM		ACT	GNM	NCO	20754

DIST. NO.	COUNTY OR PARISH	DATE COMP.	DATE 1ST PROD	GAS GRAVITY	INIT. TEST DATE	INIT. POTENTIAL	INIT. WHSIP	LATEST BHP/Z	INIT. BHP/Z	M/C	TOTAL DEPTH	PERFORATIONS	LIQUID GRAVITY	WELL HEAD PRESSURE RECORDING PRESSURE AT END OF TEST
2	EDDY	120772	12-72	.59	112972	9200	3402	.838	4360	C	10512	10372-10386		

PERIOD ENDING	MCF LAST SIX MONTHS	MCF YEARLY PRODUCTION	MMCF CUMULATIVE PRODUCTION	MMCF CUMULATIVE AT TEST	TEST DATE	POTENTIAL	WHSIP	BHP	M/C	BHP/Z	TEST WTR BBLS/DAY	MCF 6 MONTH INIT. WHSIP	SIX MONTH WATER PROD.	SIX MONTH COND. PROD.	SIX MONTH GAS PROD.
7-72															
1-73	107150	107150	1072											110	10
7-73	578629		6858	2792	01-27-73	11000	2981	3726	C	3960		663		523	9
1-74	672208	1250837	13580	8245	08-08-73		2513	3158	C	3440		927		554	8
7-74	547326		19053											386	7
1-75	472340	1019666	23777	2059	08-25-74		1733	2174	C	2400		1234		259	5
7-75	370335		27480											164	4
1-76	216028	586363	29640	2799	08-18-75		1416	1769	C	1938		1409		76	4
7-76	93792		30578											18	2
1-77	98930	192722	31567	3093	09-19-76		1402	1752	C	1917		1547		15	2

RATE MMCF



8

Identifying Number	Location	Operator	Well Name	Well
221S25E23G00PM	23G 21S 25E	HANAGAN PETROLEUM CORPOR	CATCLAW DRAW UNIT	2

State	Field Number	Field Name	Reservoir	Status	Gas Gatherer	Liquid Gatherer	API No.
NEW MEXICO	8010800	CATCLAW DRAW MORROW (GAS)	PM	ACT	L I	NCO	

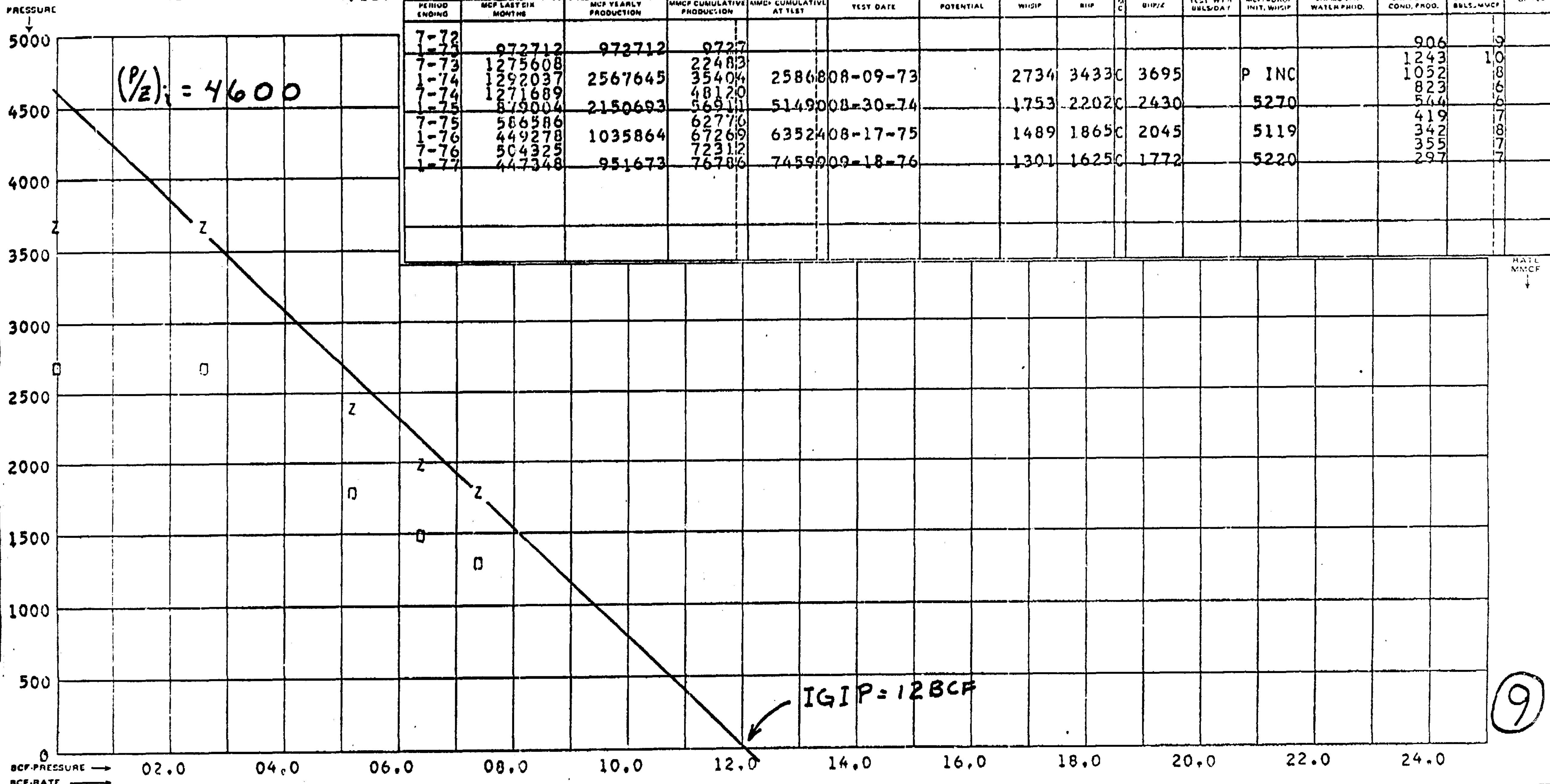
Dist. No.	County or Parish	Date Comp.	Date 1st Prod.	Gas Gravity	Init. Test Date	Init. Potential	Init. WHSIP	Latest N Fac.	Init. BHP/Z	O/C	Total Depth	Perforations	Liquid Gravity
2	EDDY		08-72	.59	012973	61000	2730	1.000	3694	C	10500	10436-10460	

PLOT SYMBOLS: WHSIP = O; BHP/Z = Z; Common = C; 6 MOS TOTAL MMCF/G = R (RATE/CUM SCALE ON RIGHT SIDE)

.50 — 424

TEMP GRAD: 1.117

Period Ending	MCF Last Six Months	MCF Yearly Production	MMCF Cumulative Production	MMCF Cumulative at Test	Test Date	Potential	WHSIP	BHP	M/C	BHP/Z	Test WTR BBLS/DAY	MCF/BOP Init. WHSIP	Six Month Water Prod.	Six Month Cond. Prod.	Six Month BBLS/MMCF	Wellhead Flowing Pressure at End of Test
7-72																
1-73	972712	972712	9727											906	9	
7-73	1275608		22483											1243	10	
1-74	1292037	2567645	35404	25868	08-09-73		2734	3433	C	3695		P INC		1052	8	
7-74	1271689		48120											823	6	
1-75	879004	2150693	56911	51490	08-30-74		1753	2202	C	2430		5270		544	6	
7-75	586586		62776											419	7	
1-76	449278	1035864	67269	63524	08-17-75		1489	1865	C	2045		5119		342	8	
7-76	504325		72312											355	7	
1-77	447348	951673	76786	74599	09-18-76		1301	1625	C	1772		5220		297	7	



9

PLOT SYMBOLS: WHSIP = O, BHP/Z = Z, Common = C

6 MOS TOTAL MMCF/D = R (RATE CUM SCALE ON RIGHT SIDE)

TEMP GRAD: 1.117

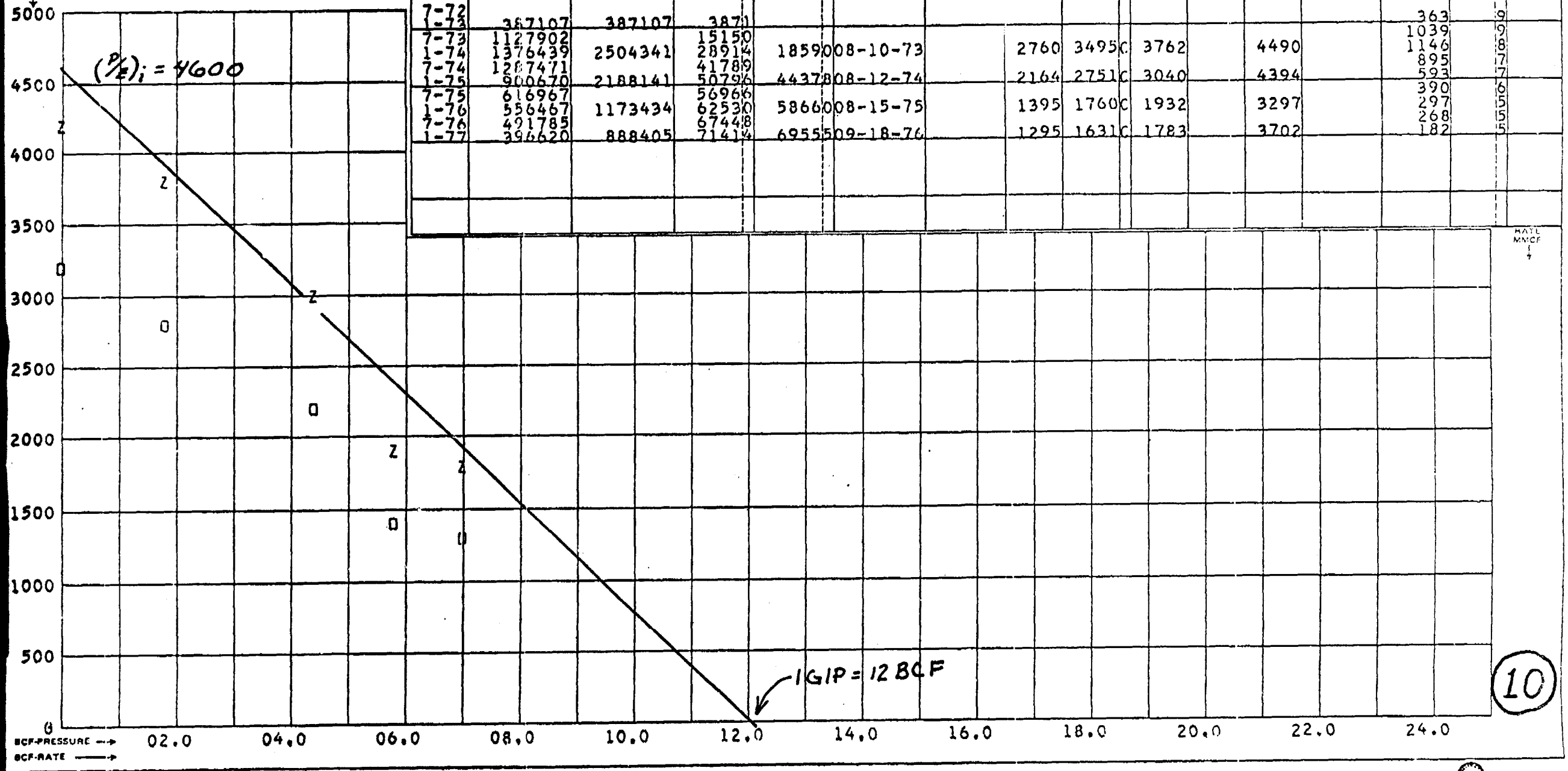
425

OPERATOR NUMBER	LEGAL LOCATION	OPERATOR	WELL NAME	WELL NO.
221525E24G00PM24G 21S 25E		HANAGAN PETROLEUM CORPOR	CATCLAW DRAW UNIT	4

STATE	FIELD NUMBER	FIELD NAME	RESERVOIR	DATUM	SUBSEA	ELEVATION	API NO.
NEW MEXICO	8010800	CATCLAW DRAW MORROW (GAS) PM		ACT	GNM	NCO	

DIST. NO.	COUNTY OR PARISH	DATE COMP.	DATE 1ST PROD.	GAS GRAVITY	INIT. TEST DATE	INIT. POTENTIAL	INIT. WHSIP	LATEST W.H.P.	INIT. BHP/Z	% CO2	TOTAL DEPTH	PERFORATIONS	LIQUID GRAVITY	WELLHEAD FLOWING PRESSURE AT END OF TEST
2	EDDY	080472	10-72	.60	012873	13000	3174	.834	4197 C		10770	10633-10698		

PERIOD ENDING	MCF LAST SIX MONTHS	MCF YEARLY PRODUCTION	MMCF CUMULATIVE PRODUCTION	MMCF CUMULATIVE AT TEST	TEST DATE	POTENTIAL	WHSIP	BHP	A/C	BHP/Z	TEST W.H. RATE/DAY	NOMINAL INIT. WHSIP	SIX MONTH WATER PROD.	SIX MONTH COND. PROD.	SIX MONTH GPD/MMCF	RATE MMCF
7-72														363	9	
1-73	387107	387107	3871											1039	9	
7-73	1127902		15150											1146	8	
1-74	1376439	2504341	28914	18590	08-10-73		2760	3495	C	3762		4490		895	7	
7-74	1287471		41789											593	7	
1-75	900670	2188141	50796	44378	08-12-74		2164	2751	C	3040		4394		390	6	
7-75	616967		56966											297	5	
1-76	556467	1173434	62530	58660	08-15-75		1395	1760	C	1932		3297		268	5	
7-76	491785		67448											182	5	
1-77	396620	888405	71414	69555	09-18-76		1295	1631	C	1783		3702				



10

PLOT SYMBOLS: WHSIP = O, BHP/Z = Z, Common = C

50

426

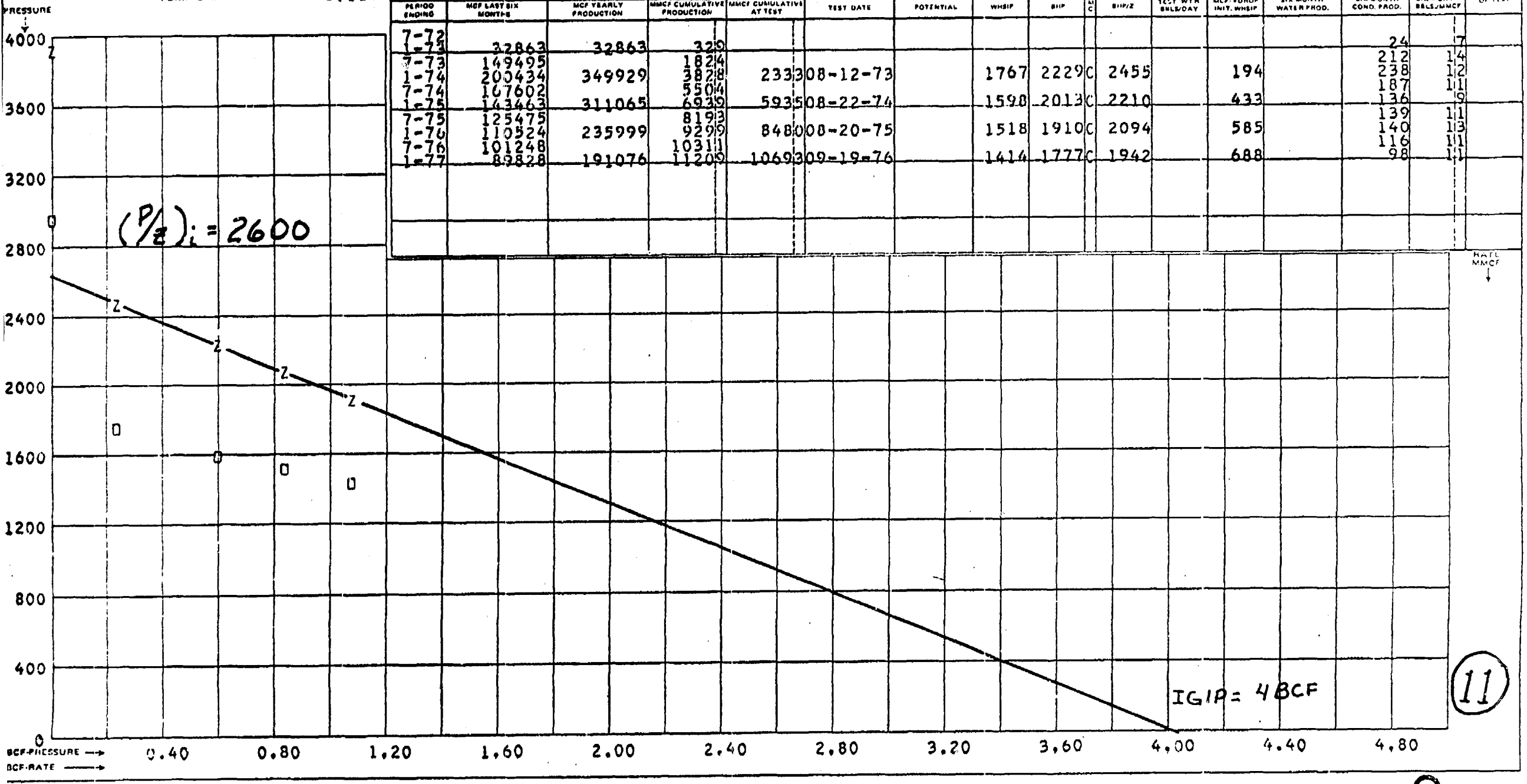
6 MOS TOTAL MMCF/6 = R
(RATE/CUM SCALE ON RIGHT SIDE)
TEMP GRAD: 1.117

IDENTIFYING NUMBER	LOCATION (UNIT)	OPERATOR	WELL NAME	WELL
22S25E25G00PM25G 21S 25E		HANAGAN PETROLEUM CORPOR	CATCLAW DRAW UNIT	5

STATE	FIELD NUMBER	FIELD NAME	RESERVOIR	STATUS	GAS CATHEDRAL	LIQUID	API NO.
NEW MEXICO	80108001	CATCLAW DRAW MORROW (GAS)	PM	ACT	L I	NCO	20714

DIST. NO.	COUNTY OR PARISH	DATE COMP.	DATE 1ST PROD.	GAS GRAVITY	INIT. TEST DATE	INIT. POTENTIAL	INIT. WHSIP	LATEST B.H.P.C.	INIT. BHP/Z	M C	TOTAL DEPTH	PERFORATIONS	CRUDE GRAVITY	WELLHEAD FLOWING PRESSURE AT END OF TEST
2	EDDY	102872	12-72	.59	102872	11000	2968	.674	3952	C	11000	10670-10876		

PERIOD ENDING	MCF LAST SIX MONTHS	MCF YEARLY PRODUCTION	MMCF CUMULATIVE PRODUCTION	MMCF CUMULATIVE AT TEST	TEST DATE	POTENTIAL	WHSIP	BHP	M C	BHP/Z	TEST WTR BBLS/DAY	MCF/DROP INIT. WHSIP	SIX MONTH WATER PROD.	SIX MONTH COND. PROD.	SIX MONTH BBLS/MMCF	RATE MMCF
7-72														24	7	
1-73	32863	32863	329											212	14	
7-73	149495		1824											238	12	
1-74	200434	349929	3828	2333	08-12-73		1767	2229	C	2455		194		187	11	
7-74	167602		5504											136	9	
1-75	143463	311065	6939	5935	08-22-74		1598	2013	C	2210		433		139	11	
7-75	125475		8193											140	13	
1-76	110524	235999	9299	8480	08-20-75		1518	1910	C	2094		585		116	11	
7-76	101248		10311											98	11	
1-77	89828	191076	11209	10693	09-19-76		1414	1777	C	1942		688				



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PLOT SYMBOLS: WHSIP = O; BHP/Z = Z; Common = C

6 MOS TOTAL MMCF/6 = R (RATE/CUM SCALE ON RIGHT SIDE)

TEMP GRAD: 1.117

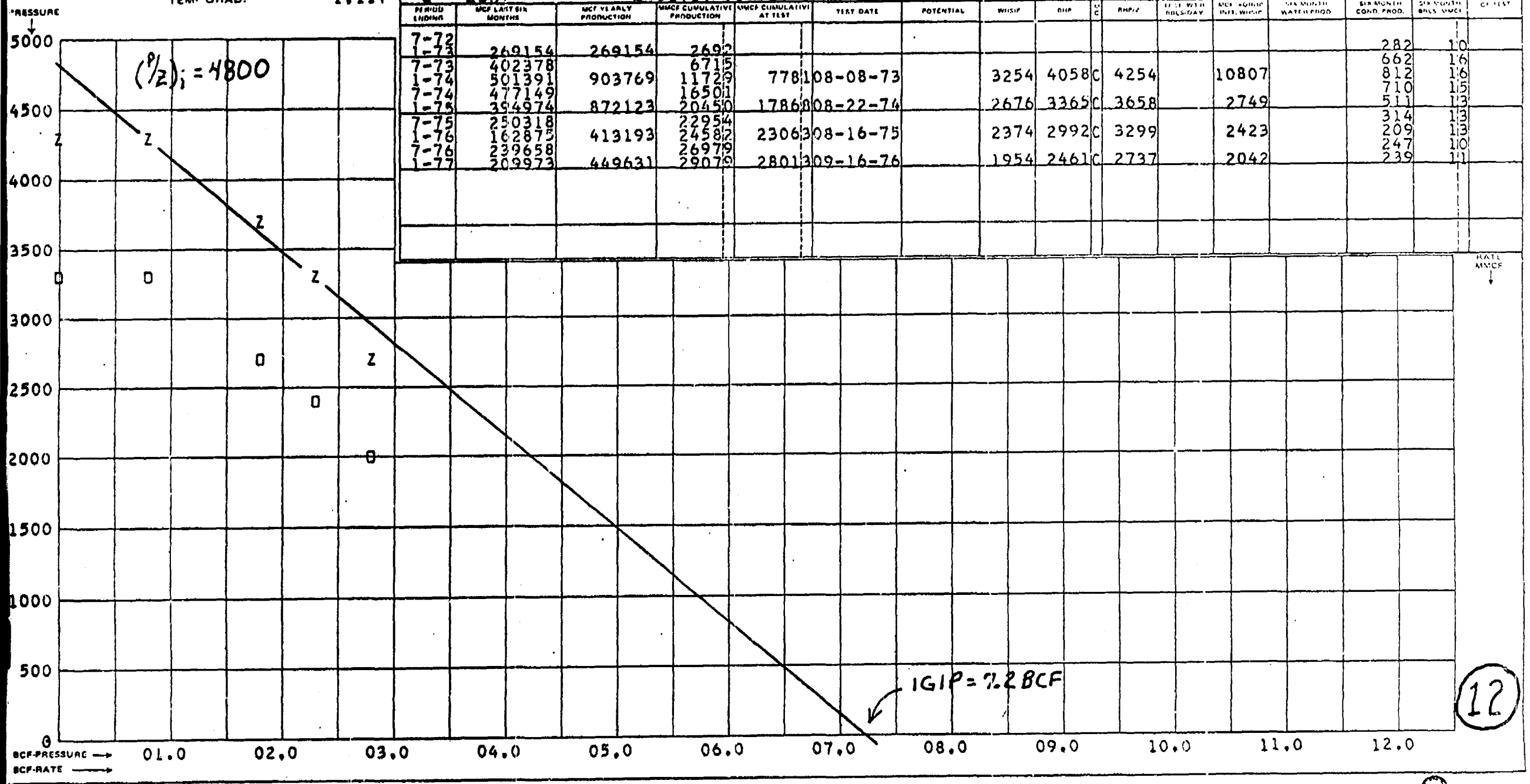
427

OPERATOR	WELL NAME	
22[illegible]E26E00RM26F 21S 25E HANAGAN PETROLEUM CORPOR	CATCLAW DRAW UNIT	1Y

STATE	FIELD NUMBER	FIELD NAME	RESERVOIR				API NO.
NEW MEXICO	8010800	CATCLAW DRAW MORROW (GAS) PM		ACT	L	I NCO	20383

DIST. NO.	COUNTY OR PARISH	DATE COMP.	DATE 1ST PROD.	GAS GRAVITY	INIT. TEST DATE	INIT. POTENTIAL	INIT. WHSIP	INIT. BHP/Z	Z	TOTAL DEPTH	PERFORATIONS	ACREAGE ASSIGNED
2	EDDY	040171	08-72	.60	012473	3600	3326	.986	4320 C	10905	10202-10570	

PERIOD ENDING	MCF LAST SIX MONTHS	MCF YEARLY PRODUCTION	MMCF CUMULATIVE PRODUCTION	MMCF CUMULATIVE AT TEST	TEST DATE	POTENTIAL	WHSIP	BHP	Z	BHP/Z	TEST WITH HOURS/DAY	MCF/D@SIP INIT. WHSIP	SIX MONTH WATER PROD.	SIX MONTH COND. PROD.	SIX MONTH OILS MSCF	WELLHEAD PRESSURE PRIOR TO AND AT END OF TEST
7-72																
1-73	269154	269154	269											282	10	
7-73	402378		6715											662	16	
1-74	501391	903769	11729	778	08-08-73		3254	4058	C	4254		10807		812	16	
7-74	477149		16501											710	15	
1-75	394974	872123	20450	1786	08-22-74		2676	3365	C	3658		2749		511	13	
7-75	250318		22954											314	13	
1-76	162875	413193	24582	2306	08-16-75		2374	2992	C	3299		2423		209	13	
7-76	239658		26979											247	10	
1-77	209973	449631	29079	2801	09-16-76		1954	2461	C	2737		2042		239	11	



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PLOT SYMBOLS: WHSIP = O; BHP/Z = Z; Common = C

6 MOS TOTAL MMCF/D = R (RATE/CUM SCALE ON RIGHT SIDE)

TEMP GRAD: 1.117

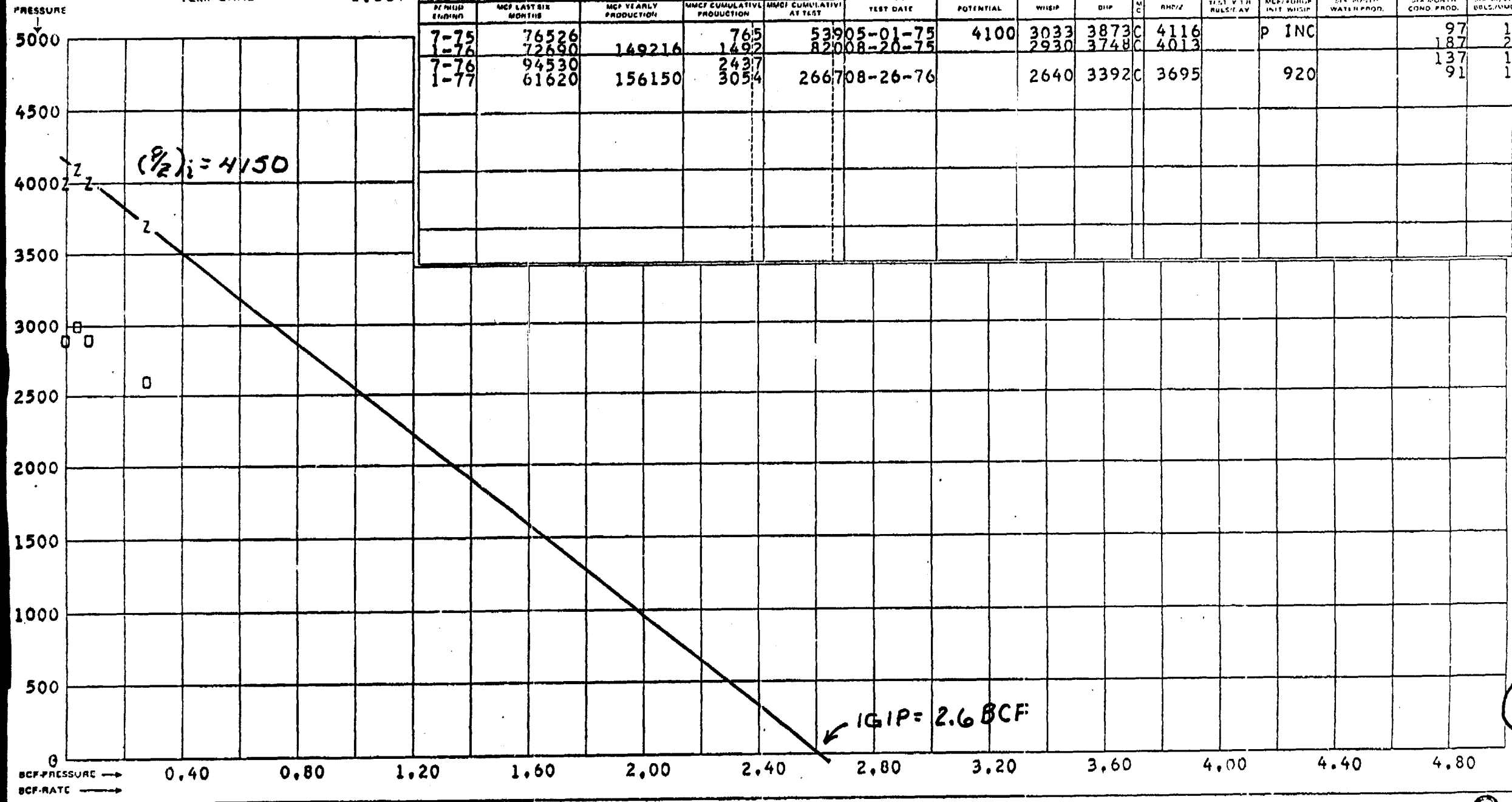
431

SEC. TWP. RGE.	OPERATOR	WELL NAME	WELL NO.
17K 00PM 17K 21S 26E	GULF OIL CORPORATION	INEXCO 17 FEDERAL COM	1

STATE	FIELD NUMBER	FIELD NAME	RESERVOIR	STATUS	GAS GRAVITY	LIQUID	API NO.
NEW MEXICO	8010800	CATCLAW DRAW MORROW (GAS) PM		ACT	GNM	PER	

DIST. NO.	COUNTY OR PARISH	DATE COMP.	DATE 1ST PROD.	GAS GRAVITY	INIT. TEST DATE	INIT. POTENTIAL	INIT. WHSIP	LATEST S.I.P.	DET. BHP/Z	M C	TOTAL DEPTH	PERFORATIONS	LIQUID GRAVITY	WELLHEAD FLOWING PRESSURE AT END OF TEST
2	EDDY	090974	03-75	.62	031575		2930	.902	4013	C	11000	10746-10887		634

PERIOD ENDING	MCF LAST SIX MONTHS	MCF YEARLY PRODUCTION	MMCF CUMULATIVE PRODUCTION	MMCF CUMULATIVE AT TEST	TEST DATE	POTENTIAL	WHSIP	BHP	M C	BHP/Z	TEST V T/R RULES/EAV	MCF/D/DP INIT. WHSIP	SIX MONTH WATER PROD.	SIX MONTH COND. PROD.	SIX MONTH BBLS/MMCF
7-75	76526		765	539	05-01-75	4100	3033	3873	C	4116		P INC		97	13
1-76	72690	149216	1492	820	08-20-75		2930	3748	C	4013				187	26
7-76	94530		2437											137	14
1-77	61620	156150	3054	2667	08-26-76		2640	3392	C	3695		920		91	15



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C50 PLOT SYMBOLS: WHSIP = O, BHP/Z = Z, Common = C — 432

6 MOS TOTAL MMCF/G = R
(RATE/CUM SCALE ON RIGHT SIDE)
TEMP GRAD: 1,117

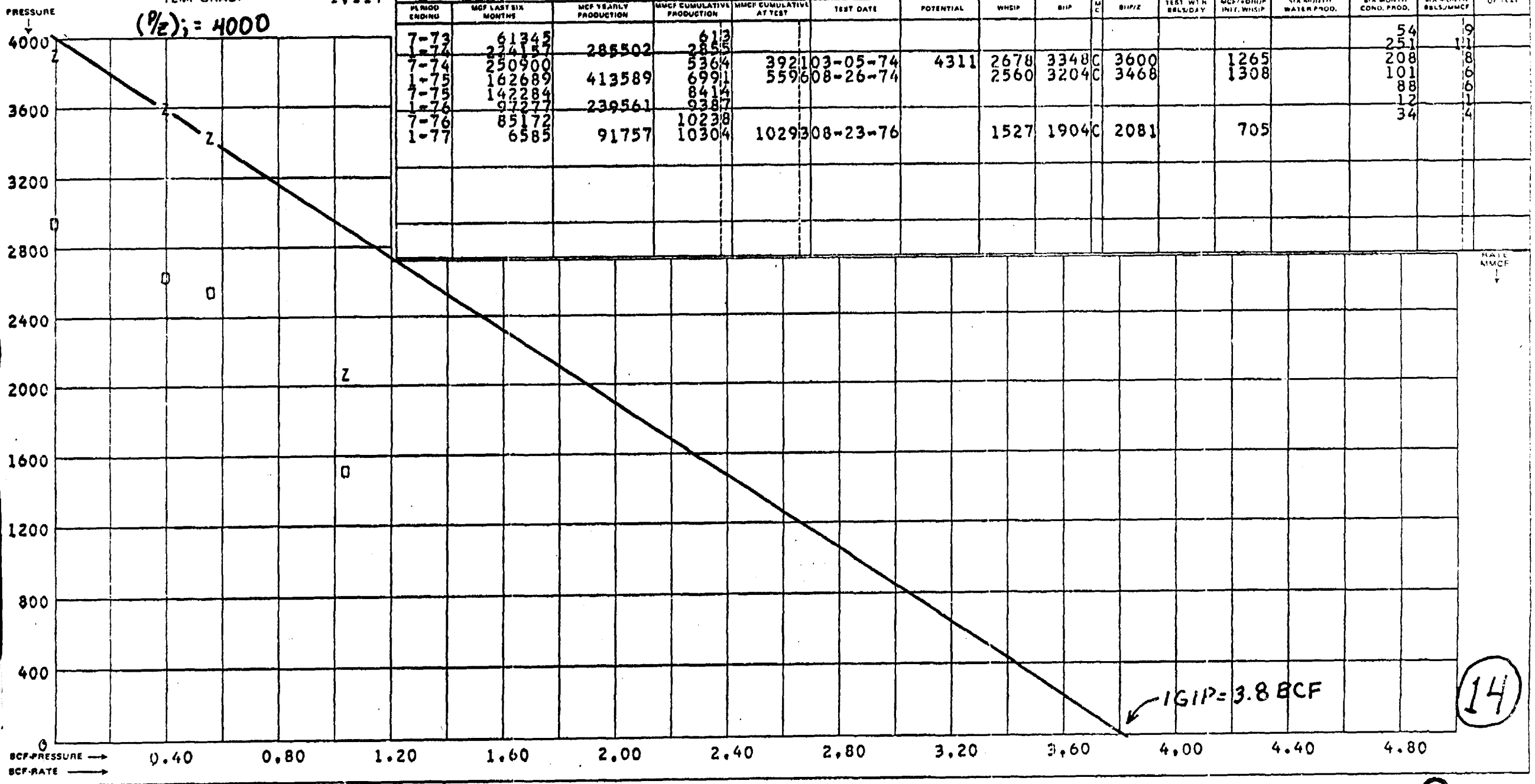
(%); = 4000

API NO.	WELL NUMBER	LOCATION	OPERATOR	WELL NAME
20743	22S26E18K000PM	18K 21S 26E	INEXCO OIL COMPANY	MCMINN STATE COM 1

STATE	FIELD NUMBER	FIELD NAME	RESERVOIR	STATUS	GAS CATEGORY	LIQUID CATEGORY
NEW MEXICO	8010800	CATCLAW DRAW MORROW (GAS) PM		ACT	GNM	PER

DIST. NO.	COUNTY OR PARISH	DATE COMP.	DATE 1ST PROD.	GAS GRAVITY	INIT. TEST DATE	INIT. POTENTIAL	INIT. WHSIP	LATERAL FAC.	INIT. BHP/Z	M/C	TOTAL DEPTH	PERFORATIONS	LIQUID GRAVITY	WELLHEAD FLOWING PRESSURE AT END OF TEST
2	EDDY	070172	05-73	.58	070373		2988	.603	3934	C	10800	10460-10724		

PERIOD ENDING	MCF LAST SIX MONTHS	MCF YEARLY PRODUCTION	MMCF CUMULATIVE PRODUCTION	MMCF CUMULATIVE AT TEST	TEST DATE	POTENTIAL	WHSIP	BHP	M/C	BHP/Z	TEST WTR BBLS/DAY	MCF/D@BHP INIT. WHSIP	SIX MONTH WATER PROD.	SIX MONTH COND. PROD.	SIX MONTH BBLS/MMCF
7-73	61345		613											54	9
1-74	224157	285502	2855											251	11
7-74	250900		5364	392	03-05-74	4311	2678	3348	C	3600		1265		208	8
1-75	162689	413589	6991	559	08-26-74		2560	3204	C	3468		1308		101	6
7-75	142284		8414											88	6
1-76	97277	239561	9387											12	1
7-76	85172		10238											34	4
1-77	6585	91757	10304	1029	08-23-76		1527	1904	C	2081		705			



PLOT SYMBOLS: WHSIP = O, BHP/Z = Z, Common = C — 433

5 MOS TOTAL MMCF/D = R (RATE/CUM SCALE ON RIGHT SIDE)

TEMP GRAD: 1.117

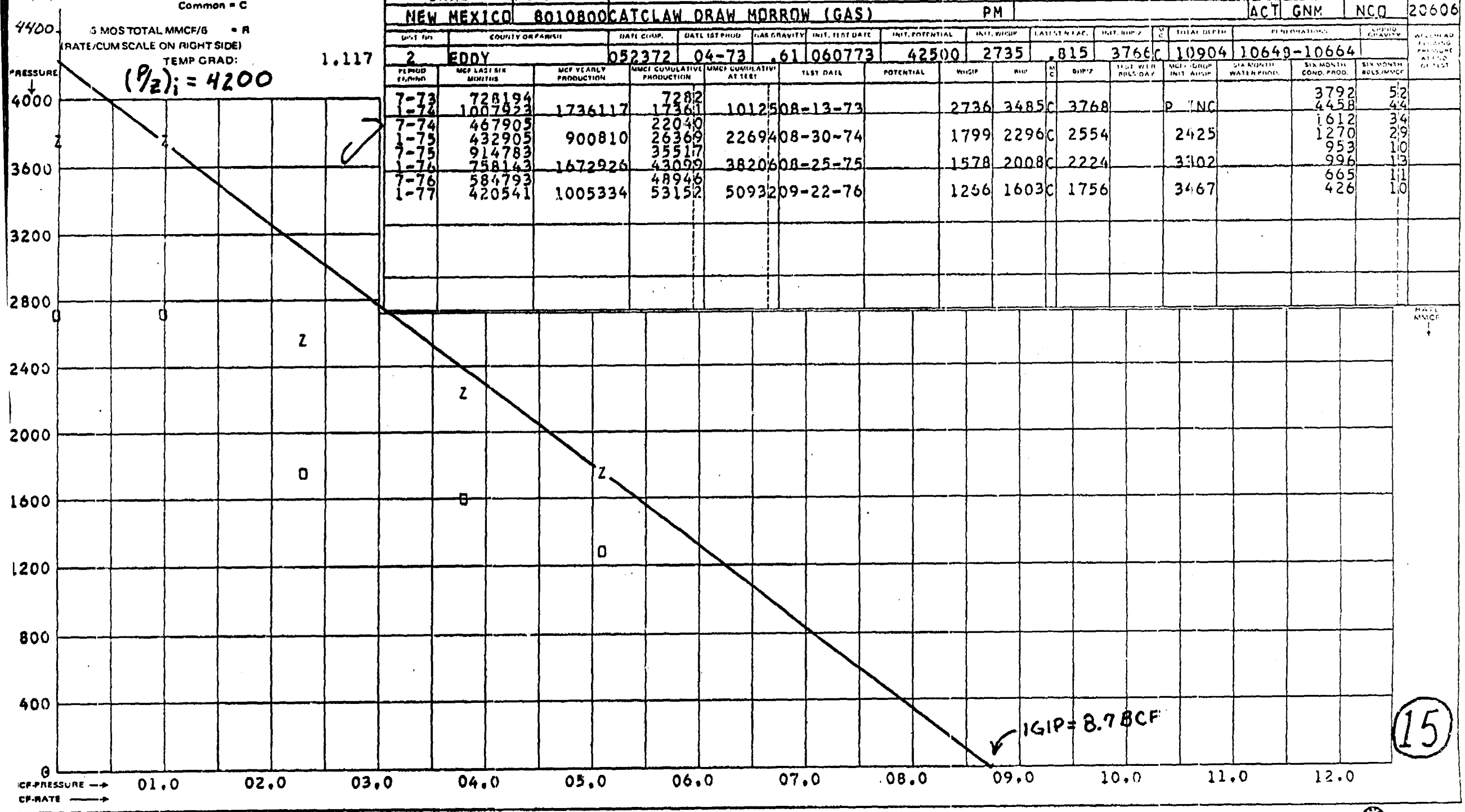
$(P/Z)_i = 4200$

SEC-TWP-RGE	LOCATION	OPERATOR	WELL NAME	WELL NO.
22S 26E 1980FNL 1980FEL 21S 26E		HANAGAN PETROLEUM CORPOR	NAN-RET COM	1

STATE	FIELD NUMBER	FIELD NAME	RESERVOIR	STATUS	GAS	LIQUID	API NO.
NEW MEXICO	80108000	CATCLAW DRAW MORROW (GAS)	PM	ACT	GNM	NCO	20606

WELL NO.	COUNTY OR PARISH	DATE COMP.	DATE 1ST PROD	GAS GRAVITY	INIT. TEST DATE	INIT. POTENTIAL	INIT. WHSIP	LATEST N FAC.	INIT. BHP/Z	M/C	TOTAL DEPTH	PERFORATIONS	CONDY GRAVITY	WELLHEAD FLOWING PRESSURE AT TIME OF TEST
2	EDDY	052372	04-73	.61	060773	42500	2735	.815	3766	C	10904	10649-10664		

PERIOD YR/MO	MCF LAST SIX MONTHS	MCF YEARLY PRODUCTION	MMCF CUMULATIVE PRODUCTION	MMCF CUMULATIVE AT TEST	TEST DATE	POTENTIAL	WHSIP	BHP	M/C	BHP/Z	TEST WTR BBLS/DAY	MCF/DROP INIT. WHSIP	SIX MONTH WATER PROD.	SIX MONTH COND. PROD.	SIX MONTH BBLS/MMCF
7-73	728194		7282											3792	5.2
1-74	1007933	1736117	17361	1012	08-13-73		2736	3485	C	3768		P INC		4458	4.4
7-74	467905		22040											1612	3.4
1-75	432905	900810	26369	2269	08-30-74		1799	2296	C	2554		2425		1270	2.9
7-75	914783		35517											953	1.0
1-76	758143	1672926	43099	3820	08-25-75		1578	2008	C	2224		3302		996	1.3
7-76	584793		48946											665	1.1
1-77	420541	1005334	53152	5093	09-22-76		1266	1603	C	1756		3467		426	1.0



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PLOT SYMBOLS: WHSIP = O, BHP/Z = Z, Common = C

6 MOS TOTAL MMCF/G = R (RATE/CUM SCALE ON RIGHT SIDE)

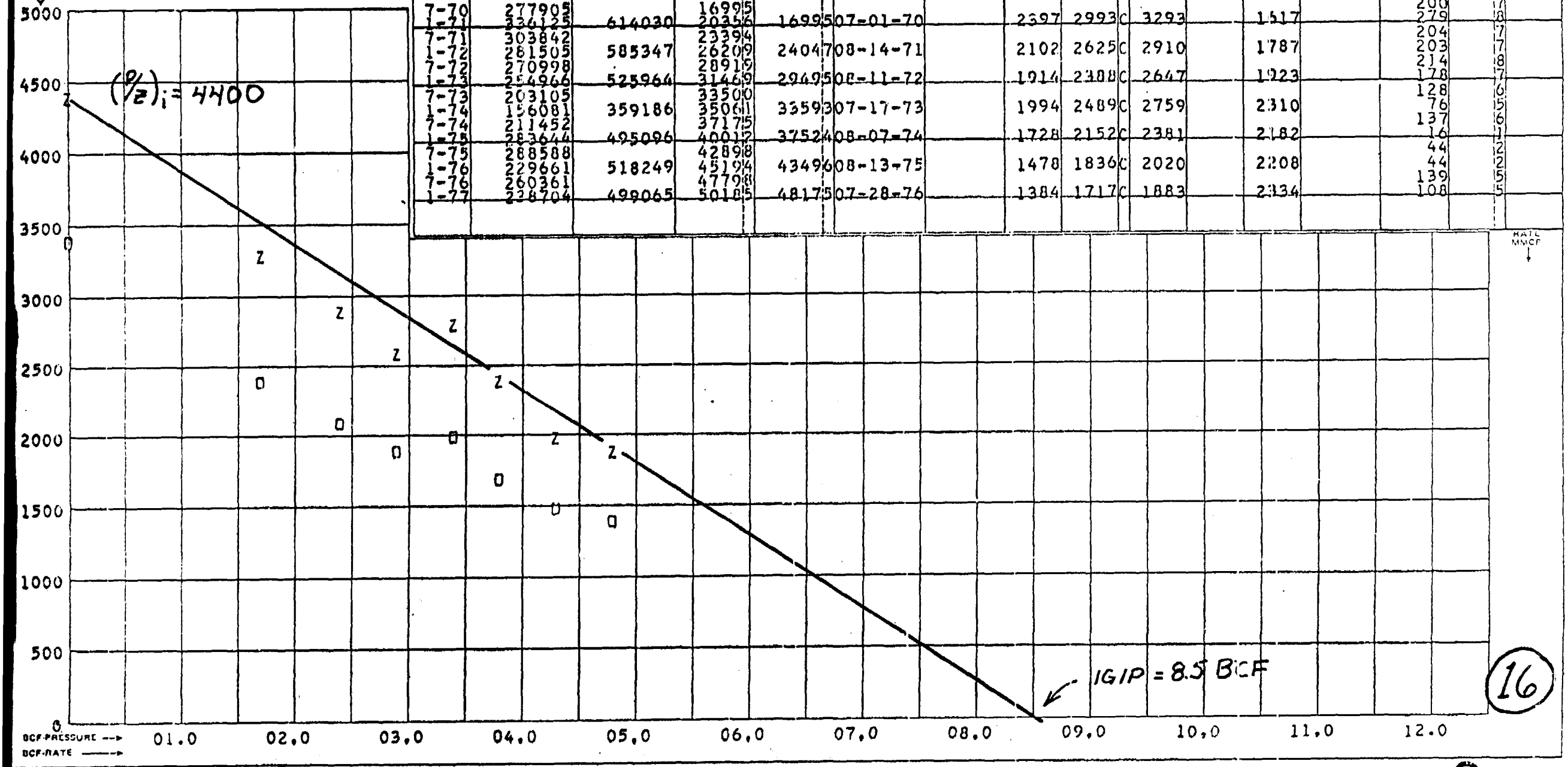
TEMP GRAD: 1.117

IDENTIFYING NUMBER	LOCATION	OPERATOR	WELL NAME	WELL NO.
22S25E11K000PM	11K 21S 25E	ATLANTIC RICHFIELD CO.	PURE FEDERAL	1

STATE	FIELD NUMBER	FIELD NAME	RESERVOIR	STATUS	GAS GATHERER	LIQUID	API NO.
NEW MEXICO	80108001	CATCLAW DRAW MORROW (GAS) PM		ACT	GNM	PER	10768

DIST. NO.	COUNTY OR PARISH	DATE COMP.	DATE 1ST PROD.	GAS GRAVITY	INIT. TEST DATE	INIT. POTENTIAL	INIT. WHSIP	LATEST N.F.A.C.	INIT. BHP/Z	M/C	TOTAL DEPTH	PERFORATIONS	LIQUID GRAVITY	WELLHEAD FLOWING PRESSURE AT END OF TEST
2	EDDY	122765		.59	020466	3428	3448	1.531	4396	C	11365	9995-10367		

PERIOD ENDING	MCF LAST SIX MONTHS	MCF YEARLY PRODUCTION	MMCF CUMULATIVE PRODUCTION	MMCF CUMULATIVE AT TEST	TEST DATE	POTENTIAL	WHSIP	BHP	M/C	BHP/Z	TEST WTR BBLS/DAY	MCF, ORIGIN INIT. WHSIP	SIX MONTH WATER PROD.	SIX MONTH COND. PROD.	SIX MONTH BBLS/MMCF	
7-70	277905		16995											200		17
1-71	336125	614030	20356	16995	07-01-70		2397	2993	C	3293		1517		279		8
7-71	303842		23394											204		7
1-72	281505	585347	26209	24047	08-14-71		2102	2625	C	2910		1787		203		7
7-72	270998		28919											214		8
1-73	254966	525964	31469	29495	08-11-72		1914	2388	C	2647		1223		178		7
7-73	203105		33500											128		6
1-74	156081	359186	35061	33593	07-17-73		1994	2489	C	2759		2310		76		5
7-74	211452		37175											137		6
1-75	283644	495096	40012	37524	08-07-74		1728	2152	C	2381		2182		16		1
7-75	288588		42898											44		2
1-76	229661	518249	45194	43496	08-13-75		1478	1836	C	2020		2208		44		2
7-76	260361		47798											139		5
1-77	238704	499065	50185	48175	07-28-76		1384	1717	C	1883		2334		108		5



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SYMBOLS: WHSIP = O, BHP/Z = Z, Common = C

428

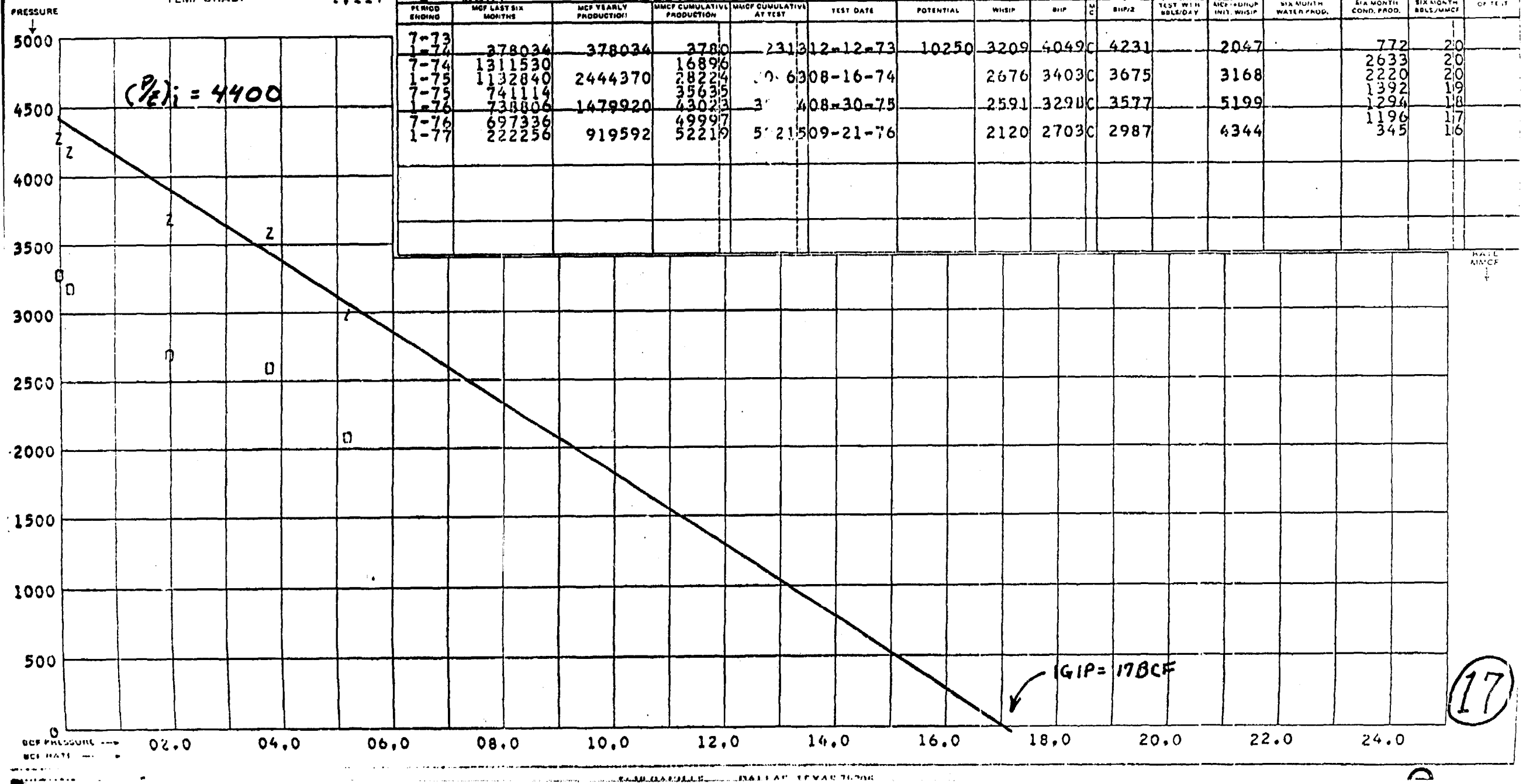
6 MOS TOTAL MMCF/G = R
(RATE/CUM SCALE ON RIGHT SIDE)
TEMP GRAD: 1.117

WELL TEST ID NUMBER	GRID LOCATION	OPERATOR	WELL NAME	WELL #
22162503500M35E 21S 25E		HANAGAN PETROLEUM CORPOR	CATCLAW DRAW UNIT	9

STATE	FIELD NUMBER	FIELD NAME	RESERVOIR	STATUS	GAS GATHERER	LIQUID	API NO.
NEW MEXICO	8010800	CATCLAW DRAW MORROW (GAS)	PM	ACT	L I	NCO	20850

DIST. NO.	COUNTY OR PARISH	DATE COMP.	DATE 1ST PROD.	GAS GRAVITY	INIT. TEST DATE	INIT. POTENTIAL	INIT. WHSIP	LATEST N FAC.	INIT. BHP/Z	M C	TOTAL DEPTH	PERFORATIONS	LIQUID GRAVITY	WELLHEAD FLOWING PRESSURE AT END OF TEST
2	EDDY	082073	10-73	.60	081773	10600	3322	.778	433[illegible]	C	10880	10804-10830		

PERIOD ENDING	MCF LAST SIX MONTHS	MCF YEARLY PRODUCTION	MMCF CUMULATIVE PRODUCTION	MMCF CUMULATIVE AT TEST	TEST DATE	POTENTIAL	WHSIP	BHP	M C	BHP/Z	TEST WTR BBLS/DAY	INCR DROP INIT. WHSIP	SIX MONTH WATER PROD.	SIX MONTH COND. PROD.	SIX MONTH BBLS/MMCF
7-73															
1-74	378034	378034	37810	231	12-12-73	10250	3209	4049	C	4231		2047		772	20
7-74	1311530		16896											2633	20
1-75	1132840	2444370	28224	.0 6	08-16-74		2676	3403	C	3675		3168		2220	20
7-75	741114		35635											1392	19
1-76	738806	1479920	43023	3	408-30-75		2591	3290	C	3577		5199		1294	18
7-76	697336		49997											1196	17
1-77	222256	919592	52219	5 21	509-21-76		2120	2703	C	2987		4344		345	16



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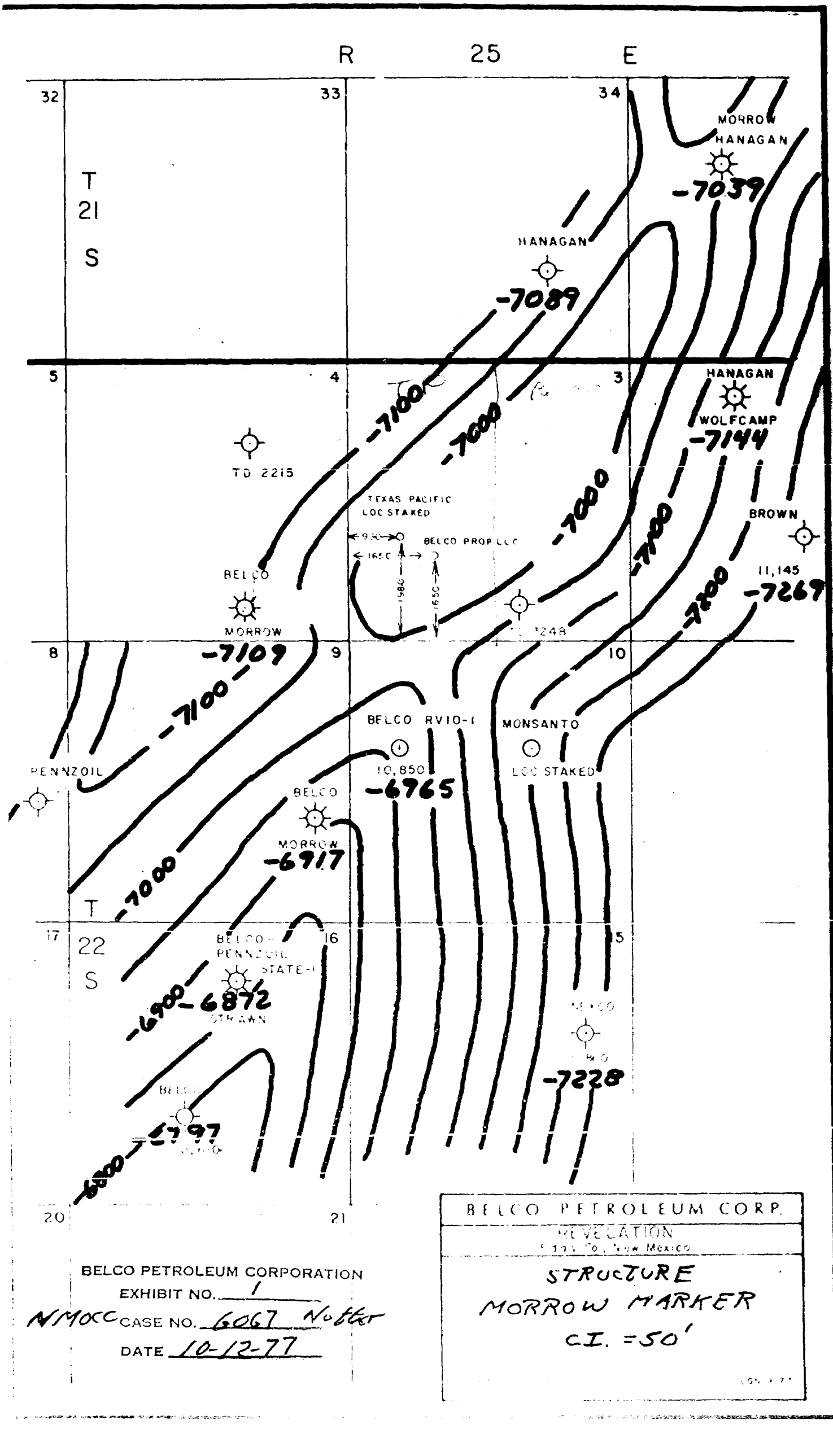
	Operator	Lease	Well No.	IP:CAOF (MCF/D)	Initial SIWHP (PSIA)	h	Øh	SW	BHT (°F)	Ø ave.	(P/Z)i	1/Bgi (SCF/cu. ft.)	IGIP/A (MCF/Acre)	IGIP (BCF)	Drainage Area (acres)
1.	Fasken	Avalon Federal	1	2,725	2,738	24	2.89	30%	156	12%				.29	
2.	Hanagan	Catclaw Draw Unit	3	5,000	3,267	none	(P & A'd after producing 51.8 MMCF)							.17	
3.	Hanagan	Catclaw Draw Unit	11	4,940	3,291	26	2.31	35%	170	9%				.26	
4.	Hanagan	Arco Federal	1	8,299	NR	13	1.15	44%	170	9%				.53	
5.	Inexco	USA - Boscowitz	1	9,800	3,278	16	1.40	42%	174	9%				.79	
6.	Texaco	E. J. Levers Federal	1	29,302	3,483	33	2.89	36%	158	9%	4,500	262	21,100	4.5	213
7.	Hanagan	Catclaw Draw Unit	6	7,750	3,500	20	1.44	35%	165	7%	4,460	256	10,400	5.1	490
8.	Hanagan	Catclaw Draw Unit	7	9,200	3,402	28	2.04	46%	157	7%	4,370	254	12,200	5.5	450
9.	Hanagan	Catclaw Draw Unit	2	27,000	3,515	32	3.36	34%	161	11%	4,600	266	25,700	12	467
10.	Hanagan	Catclaw Draw Unit	4	8,600	3,519	42	3.32	30%	156	8%	4,600	268	27,100	12	442
11.	Hanagan	Catclaw Draw Unit	5	11,000	2,968	29	2.87	34%	160	10%	2,600	151	12,500	4.0	320
12.	Hanagan	Catclaw Draw Unit	1-Y	2,800	3,472	46	4.46	30%	162	10%	4,800	277	37,700	7.2	191
13.	Gulf	Inexco "17" Federal	1	5,009	3,180	22	1.56	26%	170	7%	4,150	237	11,900	2.6	218
14.	Inexco	McMinn State	1	7,300	3,421	27	2.24	34%	160	8%	4,000	232	14,900	3.8	255
15.	Hanagan	Nan - Bet	1	84,000	3,517	16	2.80	22%	158	18%	4,200	244	23,200	8.7	375
														10 well average =	342
16.	Arco	Pure Federal	1	3,428	NR	14	1.59	22%	164	11%	4,400	253	13,700	8.5	620
17.	Hanagan	Catclaw Draw Unit	9	10,600	3,322	29	2.50*	33%*	185	10*	4,400	245	17,900	17	955
							4.68**	22‡		18**					436

1/Bgi (SCF/cu. ft.) = 35.35 Pi/(ZiT)
IGIP/A (MCF/acre) = 43.56 Øh (1 - SW) (1/Bgi)

* - Based on Field Average
** - Maximum for Field
‡ - Minimum for Field

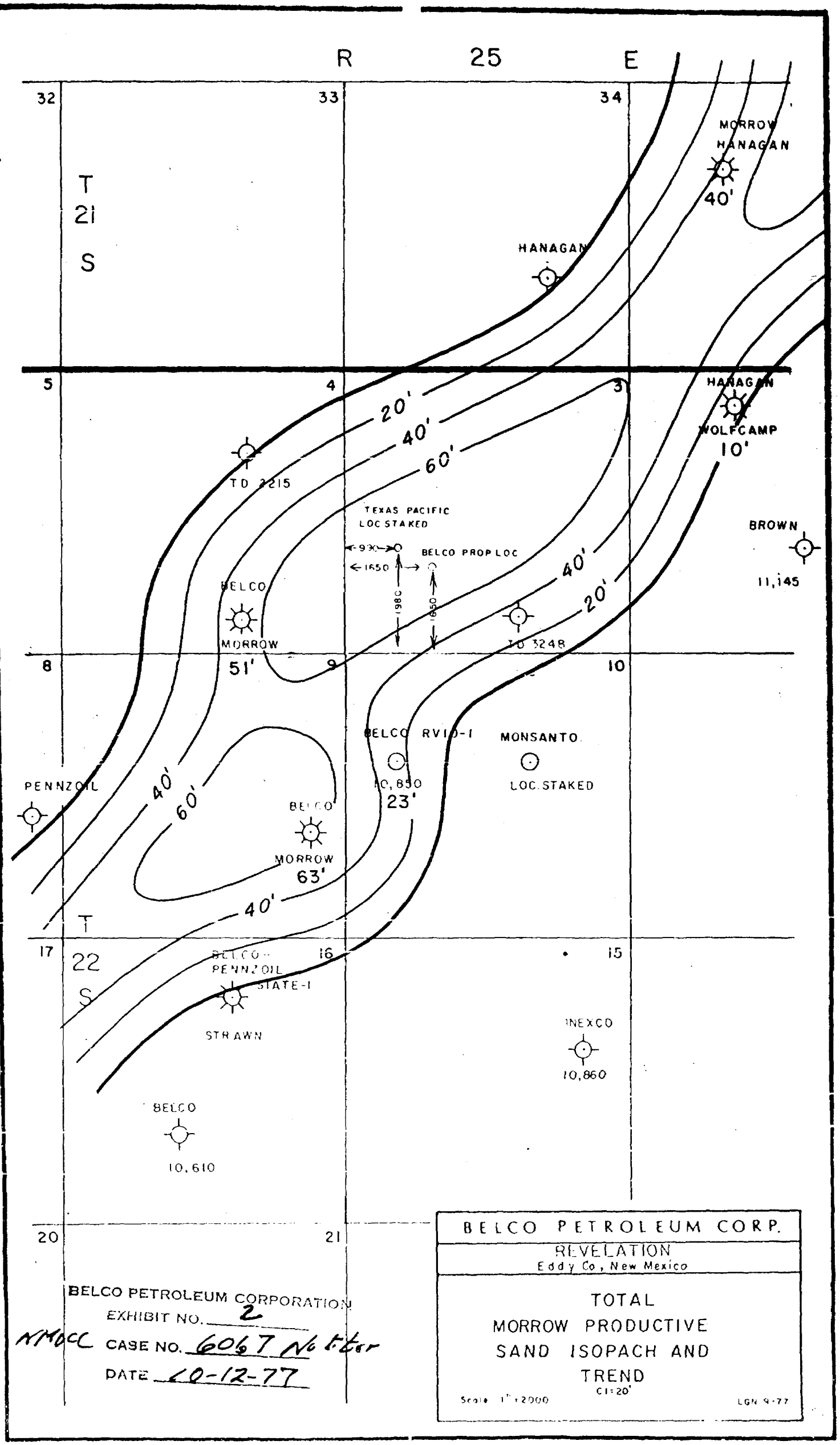
BEFORE ... OIL CO ... CASE ... Submitted ... Rec'd ...

Miller ... 12 ... Applicant ... 12/2/1982



BELCO PETROLEUM CORP.
REVELATION
[illegible] Co., New Mexico
STRUCTURE
MORROW MARKER
CI. = 50'

BELCO PETROLEUM CORPORATION
EXHIBIT NO. 1
NMOCC CASE NO. 6067 Nomenclature
DATE 10-12-77



BELCO PETROLEUM CORP.

REVELATION
Eddy Co, New Mexico

TOTAL
MORROW PRODUCTIVE
SAND ISOPACH AND
TREND

CI=20'

Scale 1"=2000

LGN 9-77

BELCO PETROLEUM CORPORATION
EXHIBIT NO. 2
NMOCC CASE NO. 6067 No Letter
DATE 10-12-77

	Operator	Lease	Well No.	IP:CAOF (MCF/D)	Initial SIWHP (PSIA)	Øh	SW	BHT (°F)	Ø ave.	(P/Z)i	1/Bgi (SCF/cu. ft.)	IGIP/A (MCF/Acre)	IGIP (BCF)	Drainage Area (acres)
1.	Fasken	Avalon Federal	1	2,725	2,738	2.89	30%	156	12%				.29	
2.	Hanagan	Catclaw Draw Unit	3	5,000	3,267	(P & A'd after producing 51.8 MMCF)							.17	
3.	Hanagan	Catclaw Draw Unit	11	4,940	3,291	2.31	35%	170	9%				.26	
4.	Hanagan	Arco Federal	1	8,299	NR	1.15	44%	170	9%				.53	
5.	Inexco	USA - Boscowitz	1	9,800	3,278	1.40	42%	174	9%				.79	
6.	Texaco	E. J. Levers Federal	1	29,302	3,483	2.89	36%	158	9%	4,500	262	21,100	4.5	213
7.	Hanagan	Catclaw Draw Unit	6	7,750	3,500	1.44	35%	165	7%	4,460	256	10,400	5.1	490
8.	Hanagan	Catclaw Draw Unit	7	9,200	3,402	2.04	46%	157	7%	4,370	254	12,200	5.5	450
9.	Hanagan	Catclaw Draw Unit	2	27,000	3,515	3.36	34%	161	11%	4,600	266	25,700	12	467
10.	Hanagan	Catclaw Draw Unit	4	8,600	3,519	3.32	30%	156	8%	4,600	268	27,100	12	442
11.	Hanagan	Catclaw Draw Unit	5	11,000	2,968	2.87	34%	160	10%	2,600	151	12,500	4.0	320
12.	Hanagan	Catclaw Draw Unit	1-Y	2,800	3,472	4.46	30%	162	10%	4,800	277	37,700	7.2	191
13.	Gulf	Inexco "17" Federal	1	5,009	3,180	1.56	26%	170	7%	4,150	237	11,900	2.6	218
14.	Inexco	McMinn State	1	7,300	3,421	2.24	34%	160	8%	4,000	232	14,900	3.8	255
15.	Hanagan	Nan - Bet	1	84,000	3,517	2.80	22%	158	18%	4,200	244	23,200	8.7	375
													10 well average =	342
16.	Arco	Pure Federal	1	3,428	NR	1.59	22%	164	11%	4,400	253	13,700	8.5	620
17.	Hanagan	Catclaw Draw Unit	9	10,600	3,322	2.50*	33%*	185	10*	4,400	245	17,900	17	955
						4.68**	22‡		18**					436

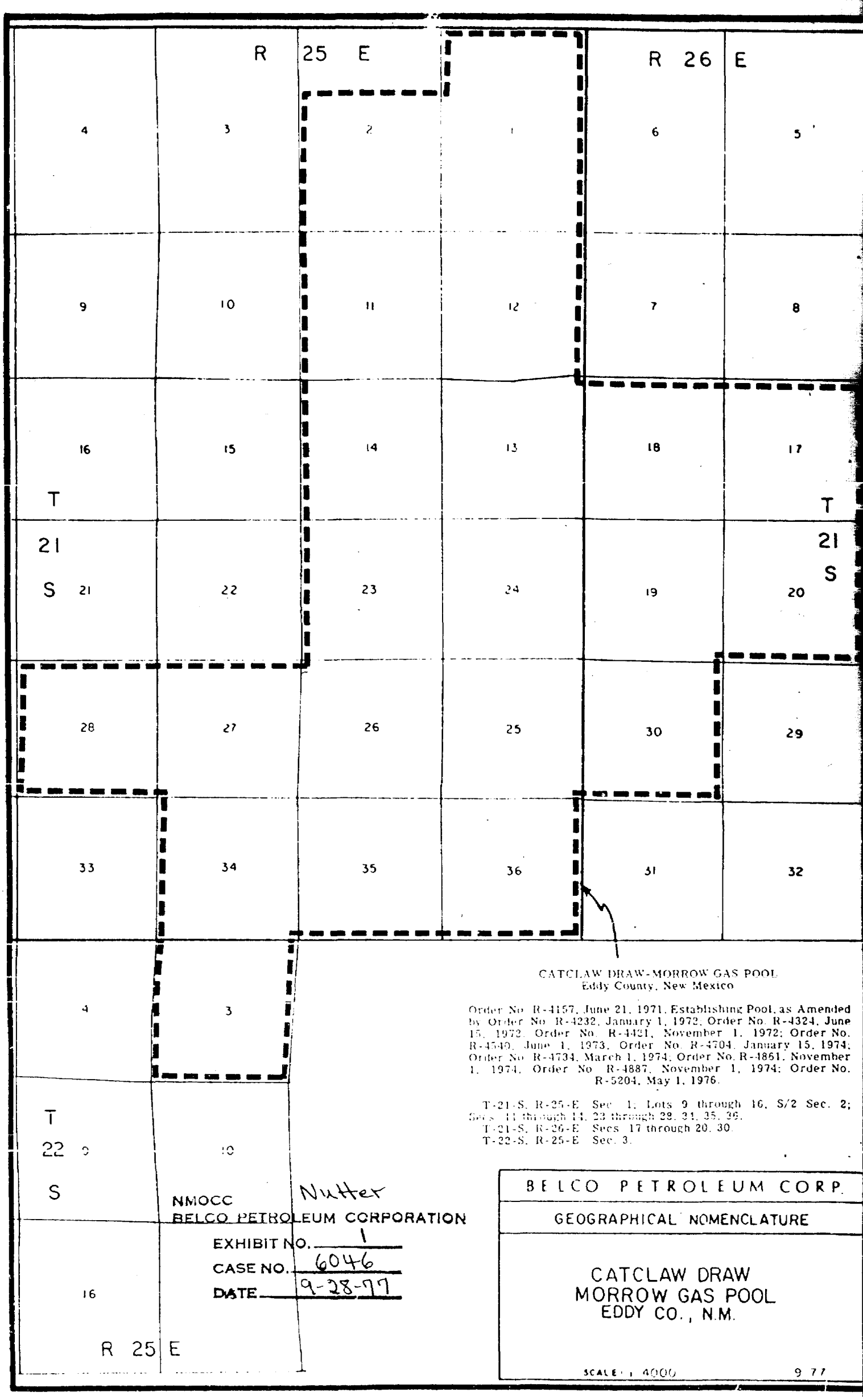
12 well ave cumulative drainage = 330
340

1/Bgi (SCF/cu. ft.) = 35.35 Pi/(ZiT)
IGIP/A (MCF/acre) = 43.56 Øh (1 - SW) (1/Bgi)

Texas Pacific
Exhibit 2
Case 6067

* - Based on Field Average
** - Maximum for Field
‡ - Minimum for Field

Ave


R 25 E
R 26 E
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16
R 25 E
CATCLAW DRAW-MORROW GAS POOL
Eddy County, New Mexico
Order No. R-4157, June 21, 1971, Establishing Pool, as Amended by Order No. R-4232, January 1, 1972, Order No. R-4324, June 15, 1972, Order No. R-4431, November 1, 1972; Order No. R-4540, June 1, 1973, Order No. R-4704, January 15, 1974; Order No. R-4734, March 1, 1974; Order No. R-4861, November 1, 1974, Order No. R-4887, November 1, 1974; Order No. R-5204, May 1, 1976.
T-21-S, R-25-E Sec. 1, Lots 9 through 16, S/2 Sec. 2; Secs. 11 through 14, 23 through 28, 34, 35, 36.
T-21-S, R-26-E Secs. 17 through 20, 30.
T-22-S, R-25-E Sec. 3.
NMOCC
Nutter
BELCO PETROLEUM CORPORATION
EXHIBIT NO. 1
CASE NO. 6046
DATE 9-28-77
BELCO PETROLEUM CORP.
GEOGRAPHICAL NOMENCLATURE
CATCLAW DRAW
MORROW GAS POOL
EDDY CO., N.M.
SCALE 1" = 4000'
9 77

R 25 E

Marathon 10-18-76 X-6459

32

Pennzoil 2-1-81 L-5135

Amoco - etal. H.B.P.

33

Am. Trad. D Fasken H.B.P.

Hanagan H B U

Gulf H.B.U.

Hanagan-Allied 6-1-79 9543

34

Hanagan-Shell HBU

Vogle-Hitt HBU

Gulf-Hanagan H B U.

Hanagan HBU

Amer. Trad etal. 2-1-83 16080

5

Gulf 7-1-84 Z1760

Gulf - ?

4

TD2215

Tex. Pacific 6-1-85 25346

Allied Chem 6-1-79 13275

3

Hanagan 11-18-79

240/320 HBP 75% - (½ B.I.) 18605

REVELATION PROSPECT

Belco 1 Fed RV-4

TD3248

U.S.

Allied F/O

U.S.

Allied F/O

Chambers 10-1-82 16787

8

Am Trad 2-1-83 16080

B.P.C. 7435-005

79.99% HBP 160/160 81.5%

120/160 HBP 78.25% (½ B.I.)

9

B.P.C. 7435-002 320/320 6-1-85 80%

Belco 1-Fed. R-10 (C)

Monsanto 6-1-85

10

B.P.C. 7435-0 160/160 6-1-85 82.5%

US Allied F/O

B.P.C. 7435-002 (A.F.) 153.35/160 9-1-81 81.25% Pennzoil 1-Brown TD10836

Gulf 4-30-79 6-19-80 B.P.C. 7435-008 81.25%

B.P.C. 7435-007 60/80 HBP 75% (½ B.I.)

Pennzoil F/O

Belco 1-Doug C. Jones 10,500 Morrow

Gulf

U.S. Gulf Joined

U.S.

B.P.C. 7436 30 40/40 6-1-85 80%

B.P.C. 7435-004 200/200 4-1-84 81.25%

17

240/320 B.P.C. HBP 75% (½ B.I.)

16

Belco 1-Pennzoil

B.P.C. 7435-002 100/160 6-1-85 80%

Allied Chem. 6-1-79 13275

15

Coquina 5-1-85

Pennzoil F/O

9-15-80 Pennzoil

12-15-80 Pennzoil

9-15-80 Pennzoil

Belco 2-Pennzoil

12-15-80 Pennzoil

Franklin 3-1-83 17731

U.S

State

U.S

m.

B.P.C. 7435-006 320/320 2-1-85 78.75%

20

Coquina 6-1-83 18488

21

Allied Chem. 1-1-84 19831

Conoco 6-1-83 18488

Kerr McGee 6-1-78 6032

6-9-77 5-26-77

22

NMOCC Nutter

BELCO PETROLEUM CORPORATION

EXHIBIT NO. 2

CASE NO. 6046

DATE 9-28-77

Inexco 6-5-82

Franklin-Aston-Fair 4-1-80 11462

6-1-78

U.S.

U.S.

U.S

Allied Chemical

Union Texas Petroleum Division
1300 Wilco Building
Midland, Texas 79701

September 21, 1977

Belco Petroleum Corporation
411 Petroleum Building
Midland, Texas 79701

RE: NM-12254
Proposed Farmout
Hackberry Hills Area
Eddy County, New Mexico

Gentlemen:

This is to advise that subject to our management's final approval we will farmout our interest to you under the E/2 of Section 3, T-22-S, R-25-E, Eddy County, New Mexico subject to the following general terms:

(1) Within 90 days from agreement date you will commence the drilling of a 10,600' Morrow test at a legal location in the SW/4 of Section 3, T-22-S, R-25-E.
(2) The proposed well will be drilled on a working interest unit and/or proration unit composed of all of Section 3, T-22-S, R-25-E, Eddy County, New Mexico.
(3) Upon completion of the well as a commercial producer of oil and/or gas we will assign to you all of our proportionate interest in the well and proration unit surrounding the well as to all rights from the surface down to the base of the deepest producing formation in the well.
(4) We shall reserve a proportionately reduced 1/16 X 8/8 overriding royalty interest under the well and proration unit surrounding the well with the option to convert the override to our proportionate part of a 50% working interest after payout.
(5) We will reserve all rights below the base of the deepest producing formation in the earning well and the preferential right to purchase the oil and/or gas attributable to the interest you may earn from Union Texas Petroleum.

This letter is not intended to be a committment between the parties. It is however an expression of the general terms under which we desire to farmout.

NMOCC Nutter
BELCO PETROLEUM CORPORATION
EXHIBIT NO. 3
CASE NO. 6046
DATE 9-28-77

DFD/dn

Yours very truly,

UNION TEXAS PETROLEUM, a Division
of Allied Chemical Corporation

Don F. Dow
District Landman

April 30, 1975

Texas Pacific Oil Co., Inc.
P. O. Box No. 4067
Midland, Texas

Attention: J. D. Larremore

Re: Revelation Prospect
Eddy County, New Mexico

Gentlemen:

According to our information, Texas Pacific owns leases covering the W/2 Section 3, T22S, R25E. Belco has recently acquired acreage in Sections 10, 11 and 15 of T22S, R25E.

We are interested in drilling a Morrow test in this area in the very near future and would appreciate your advising us whether Texas Pacific would make its acreage available on a farmout basis.

If a suitable farmout arrangement can be negotiated, we would be able to drill this area in the very near future. Thank you for your cooperation and anticipated prompt reply to this request.

Yours very truly,

BELCO PETROLEUM CORPORATION

J. A. Patterson
District Landman

JAP/MW

NMOCC Nutter
BELCO PETROLEUM CORPORATION
EXHIBIT NO. 4
CASE NO. 6046
DATE 9-28-77

Pg. 1

June 9, 1975

Texas Pacific Oil Company, Inc.
P. O. Box No. 4067
Midland, Texas
Attention: Jack Larremore

Gulf Oil Company
P. O. Box 1150
Midland, Texas
Attention: R. E. Griffith

Union Texas Petroleum,
a Division of Allied Chemical
1300 Wilco Building
Midland, Texas
Attention: Don F. Dow

Pennzoil United, Inc.
P. O. Box 1828
Midland, Texas
Attention: James A. Davidson

Monsanto Oil Company
101 North Marienfeld
Midland, Texas

Re: Revelation Prospect
Eddy County, New Mexico

Gentlemen:

Belco Petroleum Corporation proposes the formation of a three-section Working Interest Unit covering Sections 3, 9 and 10 of T22S, R25E, Eddy County, New Mexico, for the drilling of a 10,500 ft. Morrow test in the NE/4 Section 3.

According to my information, which is reflected on the attached land plat, the approximate ownership would be as follows:

Company	Acres	Percentage
Allied Chemical	640	33.3333
Belco Petroleum	320	16.6667
Texas Pacific	320	16.6667
Monsanto	320	16.6667
Gulf Oil	240	12.5000
Pennzoil	80	4.1666
	1920	100.0000%

Although Belco is not the majority owner in this proposed unit, we would be pleased to serve as Operator. However, we would be agreeable to any Operator selected by a majority of the unit participants. If your companies are interested in this proposal, we would appreciate hearing from you at your earliest convenience.

NMOCC Nutter
BELCO PETROLEUM CORPORATION

EXHIBIT NO. 4
CASE NO. 6046
DATE 9-28-77

Yours very truly,

JAP/MW

J. A. Patterson

Pg. 2

October 5, 1976

Texas Pacific Oil Company, Inc.
P. O. Box 4067
Midland, Texas 79701

Attn: Mr. Jack D. Larremore
District Landman

Re: Farmout Request
Revelation Area
Eddy County, New Mexico

Gentlemen:

Belco Petroleum Corporation respectfully request a farmout of your acreage being described as the W/2 Section 3, T-22-S, R-25-E, Eddy County, New Mexico based on the following terms and conditions:

1. Belco to commence the drilling of a Morrow test (approximately 10,500') at a location of our choice, within said Section 3, with the option to drill to the Devonian.

2. Said test to be commenced on or before 120 days from date of the execution of a formal farmout.

3. Texas Pacific to grant said farmout and retain an ORRI sufficient as to deliver to Belco no less than a 80% NRI lease with the option to convert said retained ORRI to a 40% back-in after payout.

If the above basic terms and conditions are satisfactory to you and your company, please prepare the necessary farmout agreement at your earliest convenience.

Yours very truly,

BELCO PETROLEUM CORPORATION

Mary Ward
Landman

MW/sam

NMOCC Nutter
BELCO PETROLEUM CORPORATION
EXHIBIT NO. 4
CASE NO. 6046
DATE 9-28-77

pg. 3

TEXAS PACIFIC OIL COMPANY, INC.
REGIONAL OFFICE
MIDLAND, TEXAS 79701

P. O. BOX 4067
1500 WEST WALL STREET

TEL. 915-684-5384
TWX. 910-885-5324

November 16, 1976

RECEIVED
NOV 18 1976
MIDLAND OFFICE

BELCO PETROLEUM CORPORATION
411 Petroleum Building
204 West Texas Street
Midland, Texas 79701

RE: Farmout Request
Your Revelation Area
Eddy County, New Mexico
TPOC Hackberry Area
TPOC Lease No. 70988-1

Gentlemen:

After careful evaluation of the above referenced area, we regret to advise you that we will not be able to grant your request for a farmout in the W/2 of Section 3-22S-25E, Eddy County, New Mexico.

We do appreciate your offer, and your interest in this area.

Yours very truly,

TEXAS PACIFIC OIL COMPANY, INC.

Jack D. Larremore

Jack D. Larremore
Regional Land Manager

NMOCC Nutter
BELCO PETROLEUM CORPORATION
EXHIBIT NO. 4
CASE NO. 6046
DATE 9-28-77

pg. 4

411 Petroleum Building
204 W. Texas
Midland, Texas 79701
Telephone (915) 683-6366

Belco Petroleum Corporation

August 18, 1977

Belco

Texas Pacific Oil Co., Inc.
P. O. Box 4067
Midland, Texas 79701

Attn: J. D. Larremore

Re: Revelation Prospect
Sec. 3, T22S, R25E,
Eddy Co., New Mexico

Gentlemen:

Please be advised that Belco Petroleum Corporation has secured a farmout from Allied Chemical covering their E/2 of the captioned section. As you are aware, the W/2 of Section 3 is owned by Texas Pacific. According to the New Mexico Oil Conservation Commission Field Rules, Section 3 is included in the Catclaw Draw Field and is spaced 640 acres for Morrow gas.

By this letter, Belco Petroleum Corporation, as operator, proposes drilling a 10,600' Morrow test to be located 1650 feet FS&WL's of Section 3. Our estimated completed well cost is $605,000. We will forward to you an AFE for this expenditure as soon as it is available. If you want to join in this unit, we will forward the necessary operating agreement.

If, however, you should desire to farmout your acreage in the W/2 of Section 3, we would be pleased to take it on a 1/2 back-in basis.

We plan to commence this well in October, 1977, depending upon rig availability. Therefore, your prompt consideration and reply will be greatly appreciated.

Yours very truly,

BELCO PETROLEUM CORPORATION

Mary Ward
Landman

MW:sls

NMOCC Nutter
BELCO PETROLEUM CORPORATION
EXHIBIT NO. 4
CASE NO. 6046
DATE 9-28-77

pg. 5

411 Petroleum Building
204 W. Texas
Midland, Texas 79701
Telephone (915) 683-6366

Belco Petroleum Corporation

September 8, 1977

Belco

Texas Pacific Oil Company
P. O. Box 4067
Midland, Texas 79701

Attn: J.D. Larremore

Re: Revelation Prospect
Section 3, T22S, R25E
Eddy County, New Mexico

Gentlemen:

Please be advised that on August 18, 1977 Belco sent you a letter requesting to form a drilling unit covering Section 3 as captioned. The working interest to be 50%-Belco and 50%-Texas Pacific.

Since that letter was mailed, it is our understanding that Texas Pacific intends to drill in the W/2 Section 3 on a 320 acre proration unit. Since Section 3 is under 640 acre Morrow spacing and since you choose not to participate in our proposed unit, we have filed for a Force Pool Application which is set for hearing on September 28, 1977.

We would be happy to continue negotiations to form our proposed 640 acre unit.

Yours very truly,

BELCO PETROLEUM CORPORATION

Mary Ward
Landman

MW/sam
Enc.

NMOCC Nutter
BELCO PETROLEUM CORPORATION
EXHIBIT NO. 4
CASE NO. 6046
DATE 9-28-77

pg. 6

TEXAS PACIFIC OIL COMPANY, INC.
REGIONAL OFFICE
MIDLAND, TEXAS 79701

P. O. BOX 4067
1508 WEST WALL STREET

TEL. 915-684-5584
TWX. 910-895-5384

September 8, 1977

BELCO PETROLEUM CORPORATION
411 Petroleum Building
204 West Texas
Midland, Texas 79701

ATTENTION: Ms. Mary Ward

RE: Revelation Prospect
Section 3, T-22S, R-25E
Eddy County, New Mexico
TPOC Hackberry Prospect
TPOC Lease No. 70988-1

Gentlemen:

In response to your letter of August 18, 1977, we wish to advise that activity was commenced several weeks ago for the staking of the Texas Pacific No. 1 Hackberry Federal, to be located 1980' FSL and 990' FWL of Section 3-22S-25E, Eddy County, New Mexico.

This well has been filed as a Revelation Field well as it is offset to the west and south of two of your wells. As you well know, the Revelation Field is based on a 320-acre proration unit; and because of this it will not be possible for us to join with you in a 640-acre spaced unit. We might add that we have begun proceedings for despacing Section 3 out of the Catclaw Draw Field into the Revelation Field.

We appreciate the opportunity you have afforded us, however, we feel it is in our best interests to drill this well 100% Texas Pacific on its fully owned lease covering the W/2 of Section 3.

Yours very truly,

TEXAS PACIFIC OIL COMPANY, INC.

Jack D. Larremore
Regional Land Manager

NMOCC Nutter
BELCO PETROLEUM CORPORATION
EXHIBIT NO. 4
CASE NO. 6046
DATE 9-28-77

JDL/lrp

Pg. 7

CHRONOLOGY

RE: Belco-Texas Pacific

Concerning Section 3, T-22-S, R-25-E, Eddy County,
New Mexico

4/30/75	Belco requests a farmout from Texas Pacific; no written reply.
6/9/75	Belco requests that Texas Pacific join with others in forming a three-section working interest unit inclusive of Sections 3, 9, and 10.
7 - 76 to current	Belco proceeds alone to drill one discovery well, and one development well in the above-described proposed working interest unit.
10/5/76	Belco again requests farmout from Texas Pacific.
11/16/76	Texas Pacific advises Belco by letter that Texas Pacific will not farm out.
6/13/77	Texas Pacific stakes an irregular Catclaw Draw Morrow location in Section 3.
8/17/77	Belco requests permission from the USGS (Federal lease) to stake a regular Catclaw Draw Morrow location in Section 3.
8/18/77	Belco advises Texas Pacific by letter that Catclaw Draw Morrow 640-acre spacing applies to Section 3, and requests that Texas Pacific join.
8/29/77	Texas Pacific files Application with USGS for 320-acre spacing dedication with an irregular Catclaw Draw Morrow location.
9/8/77	Belco advises Texas Pacific by letter that Belco has made Application to force pool Section 3 for Catclaw Draw Morrow.
9/8/77	Texas Pacific advises Belco by letter of staked location in Section 3 and preparations to withdraw acreage dedicated to the Catclaw Draw Morrow Pool.

NMOCC Nutter
BELCO PETROLEUM CORPORATION
EXHIBIT NO. 5
CASE NO. 6046
DATE 9-28-77

19		Revelation	New Mexico	Eddy		

NO MORE THAN NINE DIGITS PER COLUMN-WHOLE DOLLARS ONLY

SO.	CHG.	PROPERTY NO. 7435005	CSG. PT. COST	COMPL. COST	TOTAL COST
20		INTANGIBLE EXPENSE	730	734	
		Rig Expenditure			
		Move In & Out - $ 10,000			
		Drilling ___ Ft. @ $ ___ /Ft.			
		Daywork 42 days @ $2,800/day = $117,000			
		Completion/W.O. Unit 10 days @ $1000/day = 10,000			
218		Total Rig Expenditure	$127,600	$ 10,000	$137,600
612		Location - Roads, Row & Damages	10,000	3,000	13,000
204		Contract Professional Services	15,000	6,000	21,000
210		Misc. Contract Labor	2,500	5,000	7,500
418		Mud & Additives	20,000	1,000	21,000
[illegible]		Mud Logging	4,000	-	4,000
4[illegible]		Bits	20,000	500	20,500
228		Tubular Testing/Inspection	-	4,000	4,000
230		CSG/TBG Crews/Tools	4,800	3,000	7,800
422		Float Eq., Cent & Scratchers	2,800	2,000	4,800
420		Cement & Additives	15,000	8,000	23,000
236		Pump Truck/Skid Unit Serv. & Cmt. Tools	5,000	2,000	7,000
222		Coring & Analysis	-	-	-
224		Elec. Line - Logs, Perf, Production, Etc.	11,000	8,000	19,000
226		Well Testing - DST, Wireline, Etc.	-	2,000	2,000
512		Eq. Rntls. - Surface/Downhole	11,000	2,000	13,000
950		Directional Drilling Expense	-	-	-
234		Transportation - Land - Marine	20,000	5,000	25,000
410		Fuel, Power & Water	9,000	2,000	11,000
930		Well Stimulation	-	10,000	10,000
808		Insurance & Bonds	-	-	-
920		Misc. & Contingency	18,300	7,500	25,800
		TOTAL INTANGIBLE EXPENSE	$296,000	$ 81,000	$377,000

SO.	CHG.	TANGIBLE EXPENSE	CSG. PT. COST	COMPL. COST	TOTAL COST
20			732	736	
[illegible]		CSG. & LINER			
		Drive ___ Ft. ___ O.D. @ $ ___ /Ft. =			
		Cond ___ Ft. ___ O.D. @ $ ___ /Ft. =			
		Surf. 300 Ft. 13-3/8" O.D. @ $ 14.56 /Ft. = $ 4,400			
		Intr. 2300 Ft. 9-5/8" O.D. @ $ 10.55 /Ft. = 24,300			
		Prod. 10600 Ft. 5-1/2" O.D. @ $ 6.68 /Ft. = 70,800			
		Liner ___ Ft. ___ O.D. @ $ ___ /Ft. =			
426		TOTAL	$ 28,700	$ 70,800	$ 99,500
432		TUBING 10500 Ft. 2-3/8" O.D. @ $ 2.65 /Ft. = 27,800	-	27,800	27,800
430		WELLHEAD EQUIPT.	6,300	9,400	15,700
438		WELL PROD. EQUIPT. SURFACE	-	5,000	5,000
440		WELL PROD. EQUIPT. DOWNHOLE	-	7,000	7,000
442		PROD. FACILITIES TANKS, EQUIPT. & LINES	-	20,000	20,000
450		MARINE PLATFORMS	-	-	-
452		OFFSHORE PROD. FACILITIES	-	-	-
		TOTAL TANGIBLE EXPENSE	$ 35,000	$140,000	$175,000
		TOTAL WELL COST	$331,000	$221,000	$552,000

Notter-NMOCC

BELCO PETROLEUM CORPORATION
EXHIBIT NO. 7
CASE NO. 6046
DATE 2-28-77

Case 6067

Read CCC 9/21

CAMPBELL, BINGAMAN AND BLACK, P.A.
LAWYERS

JACK M. CAMPBELL
JEFF BINGAMAN
BRUCE D. BLACK
MICHAEL B. CAMPBELL

POST OFFICE BOX 2208
JEFFERSON PLACE
SANTA FE, NEW MEXICO 87501
TELEPHONE (505) 988-4421

September 20, 1977

Ms. Lynn Techendorf
Oil Conservation Commission
Legal Division
Post Office Box 2088
Santa Fe, New Mexico 87501

Dear Lynn:

Enclosed please find an Application for Hearing filed on behalf of Texas Pacific Oil Company, Inc. The Company seeks to withdraw acreage dedicated to the Catclaw Draw Morrow Pool and to extend the Revelation Morrow Pool limits to include Section 3, T22S, R25E, Eddy County, New Mexico.

It is my understanding that Belco Petroleum Corporation has filed a Force Pool Application for the same acreage. A hearing on Belco's Application is set for September ~~18~~ 28, 1977. We believe that both Applications should be heard by the Commission at the same time. We have contacted Belco to request that they voluntarily continue their scheduled hearing until October 12, 1977, the date on which I understand our Application will be heard. Belco has refused to continue its hearing voluntarily. I have therefore enclosed a Motion to Consolidate the hearing on Belco's Application with ours. I believe that consolidation of the matter is in the best interest of the Commission and the parties involved.

Very truly yours,

Michael B. Campbell

MBC.mr

Enclosures

Case 6067

APPLICATION FOR HEARING BEFORE THE NEW MEXICO OIL CONSERVATION COMMISSION

Applicant's Name: Texas Pacific Oil Company, Inc.
Regional Office
Post Office Box 4067
Midland, Texas

Common Sources of Supply: The Catclaw Draw Morrow Pool and the Revelation Morrow Pool in Eddy County, New Mexico.

General Nature of the Order Sought: To withdraw acreage dedicated to the Catclaw Draw Morrow Pool by Order No. 4861 Paragraph (M) and to extend the Revelation Morrow Pool limits to include Section 3, T22S, R25E, Eddy County, New Mexico.

Case 5336
Case 6067 to 5311
was incorporated in 5336
Case No. 4548 was inc.

Justification:

1. Dry holes to the west and southwest of the Catclaw Field have delineated the boundary of the field.

2. Section 3, T22S, R25E, is located outside the defined boundaries.

3. Rule 1 of the Special Rules and Regulations for the Catclaw Draw Morrow Gas Pool (Order No. R-4157, Case No. 4548) appears to provide that in the event dedicated Catclaw acreage is nearer to another designated Morrow gas pool, such acreage should be reclassified and drilled under the closer pool field regulations. Section 3, T22S, R25E is nearer to the Revelation Morrow gas pool and should be reclassified and drilled under the pool field regulations governing that pool.

Respectfully submitted,

CAMPBELL, BINGAMAN & BLACK

By _____
Michael B. Campbell
Attorneys for Applicant,
Texas Pacific Oil Company, Inc.
Post Office Box 2208
Santa Fe, New Mexico 87501

DRAFT

dr/

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

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

CASE NO. 6067

Order No. R- 5594

APPLICATION OF TEXAS PACIFIC OIL CO., INC., FOR POOL CONTRACTION AND EXTENSION, EDDY COUNTY, NEW MEXICO.

NOMENCLATURE

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on October 12, 19 77, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this _____ day of December, 19 77, 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, Texas Pacific Oil Co., Inc., is the owner of an oil and gas lease covering the W/2 of Section 3, Township 22 South, Range 25 East, NMPM, Catclaw Draw-Morrow Gas Pool, Eddy County, New Mexico.

(3) That Belco Petroleum Corporation is the operator, by farmout agreement, of an oil and gas lease covering the E/2 of Section 3, Township 22 South, Range 25 East, NMPM, Catclaw Draw-Morrow Gas Pool, Eddy County, New Mexico.

(4) That in Case No. 6046, heard by the above-named examiner on September 28, 1977, Belco Petroleum Corporation seeks an order from the Commission pooling all mineral interests in the Morrow formation underlying all of Section 3, Township 22 South, Range 25 East, NMPM, Catclaw Draw-Morrow Gas Pool, Eddy County, New Mexico, to form a standard 640-acre spacing and proration unit for said pool to be dedicated to a well Belco proposes to drill in the SW/4 of said Section 3.

(5) That in the instant case, Texas Pacific Oil Co., Inc., seeks an order from the Commission deleting all of the aforesaid Section 3 from the horizontal boundaries of the ~~Catclaw Draw~~ Catclaw Draw-Morrow Gas Pool and extending the horizontal boundaries of the Revelation-Morrow Gas Pool in Sections 4 and 9 of Township 22 South, Range 25 East, NMPM, Eddy County, New Mexico, to include said Section 3.

(6) That the Revelation-Morrow Gas Pool is spaced one well to each 320 acres, and Texas Pacific proposes to dedicate the W/2 of the aforesaid Section 3 to a Morrow gas well it proposes to drill in the SW/4 of said Section 3.

(7) That the records in Cases Nos. 6046 and 6067 were consolidate by the examiner but a separate order should be entered in each case.

(8) That the Catclaw Draw-Morrow Gas Pool was created and defined by Commission Order No. R-4157 dated June 21, 1971, which order also established 640-acre spacing for said pool on a temporary basis pending development of additional reservoir information.

(9) That the 640-acre spacing rules for said pool were extended for a period of one year by Commission Order No. R-4157-A dated September 13, 1973, and were extended indefinitely by Commission Order No. R-4157-B dated October 22, 1974, with the specific provision that the rules should apply only to wells within the defined limits of the pool and not, as is often the case in other pools, to the pool limits and to lands outside said limits but within one mile thereof.

(10) That the aforesaid limitation to the application of the pool rules was "...to avoid conflicts of spacing patterns and violation of correlative rights," inasmuch as the Catclaw Draw-Morrow Gas Pool was being developed on 640-acre spacing and "...the drilling of Pennsylvanian gas wells on the standard Southeast New Mexico spacing of 320 acres [was] occurring in lands offsetting the established limits of the...pool but outside the productive limits of the pool."

(11) That in an effort to protect correlative rights by finding the appropriate line of juxtaposition for the meeting of two different spacing patterns, i.e., 320-acre spacing and 640-acre spacing, the Commission entered Order No. R-4861 effective November 1, 1974, and Order No. R-4887, also effective November 1, 1974, extending the Catclaw Draw-Morrow Gas Pool in several places, including all of Section 3, Township 22 South, Range 25 East, NMPM.

(12) That some of the aforesaid extensions were predicated upon the completion of Morrow gas wells the characteristics of which indicated that they were in fact completed in the Catclaw Draw-Morrow Gas Pool, but others of said extensions were based upon the Commission's interpretation of the best geological information available at the time.

(13) That the extension of the Catclaw Draw-Morrow Gas Pool to include the aforesaid Section 3 was based upon such geological information inasmuch as the nearest production from the Catclaw Draw Pool was from a well in the SE/4 SW/4 of Section 35, Township 21 South, Range 25 East, NMPM.

(14) That the geological information at hand when the pool was extended to include Section 3, Township 22 South, Range 25 East, NMPM, indicated a favorable looking Morrow structure extending from Sections 23, 26, and 35 of Township 21 South, Range 25 East, NMPM, where producing Morrow gas wells were located, into Sections 27 and 34 of Township 21 South, Range 25 East, NMPM, and Section 3, Township 22 South, Range 25 East, NMPM.

(15) That subsequent to the extension of the pool to include, among other lands, the aforesaid Section 3, non-productive Morrow wells have been drilled in Sections 27 and 34, Township 21 South, Range 25 East, and in Section 2, Township 22 South, Range 25 East, NMPM.

(16) That this subsequent development and the attendant additional geological information would appear to indicate that the favorable looking Morrow structure described in Finding No. (14) above is either non-existent, or of a different configuration than originally thought, or is non-productive of gas from the Catclaw Draw-Morrow Gas Pool.

(17) That a non-productive belt in the Morrow formation appears to run in a north-south direction through the east half of Sections 27 and 34, Township 21 South, Range 25 East, NMPM, thence southeasterly across Section 2, Township 22 South, Range 25 East, NMPM, thereby effectively separating Section 3 of Township 22 South, Range 25 East, NMPM, from the Catclaw Draw-Morrow Gas Pool.

(18) That the aforesaid non-productive belt constitutes a reasonable and logical line of juxtaposition for the meeting of two different spacing patterns, and in order to prevent waste and protect correlative rights, the Catclaw Draw-Morrow Gas Pool should be contracted by the deletion therefrom of all of Section 3, Township 22 South, Range 25 East, NMPM.

(19) That while there is another productive Morrow structure to the south and west of said Section 3, and the Commission has heretofore created and defined the Revelation-Morrow Gas Pool to include portions of said structure, and it appears that said structure extends north and east into said Section3, it would be premature for the Commission to extend the Revelation-Morrow Gas Pool into said Section 3 at this time.

(20) That the application of Texas Pacific Oil Co., Inc., for the extension of the Revelation-Morrow Gas Pool should be denied.

IT IS THEREFORE ORDERED:

(1) That the Catclaw Draw-Morrow Gas Pool, Eddy County, New Mexico, as heretofore classified, defined, and described, is hereby contracted by the deletion of the following described lands:

TOWNSHIP 22 SOUTH, RANGE 25 EAST, NMPM
Section 3: All

(2) That the application of Texas Pacific Oil Co., Inc., for the extension of the Revelation-Morrow Gas Pool is hereby denied.

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

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