Case No. 6847

Application, Transcripts, Small Exhibits, Etc.

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

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6647

May 20, 1981

Tenneco Oil Company
Exploration and Production Co.
P. O. Box 3249
Englewood, Colorado 80155

Attention: Mr. Carley Watkins

Re: M. G. Eaton A Well No. 1
Unit B, Section 25, Township
29 North, Range 11 West,
San Juan County, New Mexico

Gentlemen:

Reference is made to your application dated January 16, 1981, for authority to commingle Chacra and Mesaverde production in the well-bore of the subject well and to then dually complete to also produce Dakota through a separate string of tubing.

Order No. R-6313 authorized this manner of completion for a well to be located in Unit A of the same section.

If the well in Unit B is considered to be a substitute for the one previously authorized for Unit A, as we presume it is, we will consider approval already given with no further action necessary on the part of this office. Please advise if our presumtion is correct.

Very truly yours,

JOE D. RAMEY
Division Director

JDR/DN/og

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
STATE LAND OFFICE BLDG.
SANTA FE, NEW MEXICO
26 March 1980

EXAMINER HEARING

IN THE MATTER OF:

Application of Tenneco Oil Company for dual completions and downhole commingling, San Juan County, New Mexico.

CASE 6847

BEFORE: Richard L. Stamets

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation Division: Ernest L. Padilla, Esq.
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For the Applicant: W. Thomas Kellahin, Esq.
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E X H I B I T S

MR. STAMETS: We'll call next Case 6847.

MR. PADILLA: Application of Tenneco Oil Company for dual completions and downhole commingling, San Juan County, New Mexico.

MR. STAMETS: Call for appearances in this case.

MR. KELLAHIN: Tom Kellahin of Santa Fe, New Mexico, appearing on behalf of the applicant, and I have two witnesses.

MR. STAMETS: I'd like to have them stand and be sworn, please.

(Witnesses sworn.)

CAROLYN PEAVEY

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Would you please tell us your name, by whom you're employed, and in what capacity?

A. It's Carolyn Diane Peavey. I'm employed by Tenneco Oil Company and I'm a Senior Geological Engineer.

Q. Ms. Peavey, have you previously testified

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before the Oil Conservation Division?

A. No, I have not.

Q. Will you describe for the Examiner when and where you obtained your degree?

A. I graduated in 1974 from Stephen F. Austin State University, it's in Nacogdoches, Texas, with a BS in geology.

Q. Subsequent to graduation where have you been employed as a geologist?

A. I spent four and a half years with Sun Oil Company and the first year and a half was as a research geophysicist; the next three years were as a production geologist, and then I joined Tenneco Oil Company a year and a half ago as a geological engineer, and as of December of this year I was a senior geological engineer.

Q. Pursuant to your employment as a geologist with Tenneco, have you made a study of and are you familiar with the geological facts surrounding this particular application?

A. Yes, I am.

MR. KELLAHIN: We tender Ms. Peavey as an expert geologist.

MR. STAMETS: The witness is considered qualified.

Q. Would you please refer to what we've

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marked as Exhibits One, and I think it might be helpful if we also looked at the same time at Exhibit Number Two.

And, Ms. Peavey, if you'll begin your testimony by looking at Exhibit Number Two and identifying for us, first of all, how the wells you propose to complete as Chacra-Mesaverde downhole commingled wells, how those wells are identified and where they are located.

A. Okay. The Mesaverde-Chacra commingled are the locations that are just a single dot. That would be the northwest quarter of Section 19, Township 29 North, 10 West; the northwest quarter of Section 30, Township 29 North, 10 West; southeast quarter of Section 24, 29 North, 11 West; the northwest quarter of Section 25, 29 North, 11 West; and the southeast quarter of Section 25, 29 North, 11 West.

Q. And each of those five wells for which you propose a program for the downhole commingling of the Mesaverde and Chacra are identified specifically on Exhibit Number One, are they not?

A. Yes, they are, the first five wells, the second five wells.

Q. All right. What is identified by those wells with the well dot and the circle around the well dot?

A. Those are wells that we intend to drill to the Dakota and dual it with the Mesaverde-Chacra com-

mingled.

Q. Now let's start off with the spacing in the Chacra for this area. What will be the spacing for the Chacra wells?

A. The spacing on the Chacra is 160's.

Q. Okay. What is the spacing for each well to be completed in the Dakota formation?

A. Okay, they will be on 320's. The wells -- well, the -- it's 320 spacing now. Section 19 will be the west half, and the spacing in the well, the Dakota well in Section 30 will be in the north half. Going to Section 24, 29 North, 11 West, it will be the east half. Going to Section 25, it's split, east half/west half.

Q. All right. Now, the five Dakota wells involved, are these original Dakota wells on a proration unit or are these infill Dakota wells?

A. These will be infill wells.

Q. So on each of the five proration units there already exists an original Dakota producer.

A. This is true.

Q. And where would the Dakota producer be located?

A. They are at the time located where the single dots are, where we propose to have the Mesaverde-Chacra commingled wells. They're in the same quarter section.

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Q. All right. What is the spacing for the Mesaverde formation?

A. Right now the Mesaverde is in the undesignated Mesaverde and it will be on 160's.

Q. To orient the Examiner, where does this area lie in reference to the Blanco Mesaverde Pool?

A. It lies about two and a half miles southeast of the existing Blanco Mesaverde Pool.

Q. Are there any other wells in the immediate area located on Exhibit Number Two, which are operated by another operator and which produce either from the Chacra or Mesaverde formations?

A. No, all the wells that produce are on this map.

Q. All right, what about the Getty wells located to the north? What kind of wells are those?

A. Okay. Map 3, or your Exhibit Three, shows the existing Mesaverde completions. There are four of them at this time that I've included in the undesignated Mesaverde.

Q. Would you identify the four wells that are completed in the undesignated Mesaverde?

A. Okay. The one in the northeast quarter of Section 13, 29 North, 11 West, is the Hauk B No. 1.

The one in the northwest quarter of Sec-

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tion 18, 29 North, 10 West, is the Hanley A No. 1.

The southwest quarter of Section 18, 29 North, 10 West, is the Hanley B No. 1.

And the Buntz A No. 1 is the one in the northeast quarter of Section 19, 29 North, 10 West.

Q. Do any of those wells produce from any other formation other than the Mesaverde?

A. They are at this time dualed with the Chacra.

Q. Am I correct, I believe you've already said it, but am I correct in understanding that each of the Getty Wells are dedicated to 160-acre spacing and proration unit, dedicated to an undesignated Mesaverde formation?

A. Yes, sir.

Q. Would you now turn to what we've marked as EXhibit Number Four and have you identify that?

A. Okay. Exhibit Number Four is the Hanley B No. 1. It is the well, Getty's well that is closest to our acreage in question. That is dualed in the Mesaverde and the Chacra. This is a type log of the Chacra. They encountered about 8 to 10 feet of pay with average porosity of 2 percent, and their IP was 791 Mcf a day. Their shut-in casing pressure was 1012.

Q. Why have you chosen this particular log as a type log for the Chacra completion in each of the sub-

ject wells?

A. This well is the closest to Tenneco's acreage and I think -- I believe typifies what we will be encountering if we drill the well. We have a cross section, the next exhibit is the cross section of the Chacra.

Q. That's Exhibit Number Five?

A. Right.

Q. Let's look at that.

A. This is a southeast/northwest trending cross section. The type log is the well that is situated at A'. It extends southwest of Tenneco's acreage. As you can see, the Chacra is developed. We anticipate about 8 to 10 feet of pay in Tenneco's wells that we drill.

Q. Will you start with A and continue through A' and describe briefly each of the wells you've placed on your cross section?

A. Okay. Starting in the southwest quarter, we have the Delo No. 2 and it has two stringers that are developed in the Chacra. Estimated pay again is about 8 feet.

Moving towards the northeast we have the two stringers that are developed more as one sand with a slight shale indication. Probably pay would be about 10 to 12 feet.

Moving farther northeast to the Valdez

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A No. 1 we lose -- it appears we lose the resistivity in the first stringer, so production is probably only from the second stringer, and I anticipate a pay of about 6 to 8 feet.

Moving farther northeast, we do lose the first stringer and the second stringer is the production zone. Pay is about 6 feet.

And moving up to the Hanley B. No. 1 we have the first stringer again -- or second stringer again as production, and pay is about 8 feet.

Q. Okay. Would you turn to what we've marked as Exhibit Number Six and discuss the characteristics of the Mesaverde formation encountered in this area?

A. Okay, this is the Mesaverde formation. In this particular well, this is the Hanley B No. 1. The Point Lookout and the Menafee are the only two producing members of the Mesaverde.

Point Lookout had 18 feet of net pay and the Menafee had 32 feet of net pay, and the isolated stringers.

This well was perforated;initial potential was 2 barrels of condensate and 2.1 million cubic feet of gas a day. Shut-in tubing pressure was 1290.

Q. And why have you chosen this particular well as a type log for the Mesaverde?

A. Again, this is the well that is closest

to Tenneco's acreage and gives us a feel for what we may anticipate as far as what is the most production.

Q Go to the cross section marked Exhibit Number Seven and describe for us generally the -- how the Mesaverde formation appears through the cross section?

A Starting from the northeast, we have the Hanley B No. 1. As we progress southwest we encounter -- we get up-dip of structure.

As you know, the Menafee is -- was a plutal (sic) depositional environment. Most of the sand developments are not continuous throughout the area. There are isolated sand stringers.

The Cliff House in the Hanley B No. 1 encountered about 18 feet of pay again, and most of the production, I believe, is coming from the Menafee where you have 32 feet of pay.

As you move -- well, what is colored in this map in yellow is what I anticipate as being productive stringers, and what is in blue is what I calculated to be water productive.

As you move to the southwest, you're going up structure. You're encountering more of the stringers in the Menafee, becoming water productive, due to hydrodynamics, and also probably due to the fact that the stringers are not continuous from one well to another.

Q. As a generalization, Ms. Peavey, which of the two zones is generally going to be the better producing formation in each of the subject wells?

A. Typically in the San Juan Basin the Point Lookout is; however, taking the Hanley B No. 1, the Menafee, I believe, is the main producing horizon from this, and I -- as you move farther southwest you do not see the Menafee as productive across Tenneco's acreage.

The interval of the Menafee is from about 3550 down to about 4100.

Q. As a geologist would you recommend to your management the drilling and testing of the Mesaverde formation alone in this area?

A. Not for the reserves that we see here, no.

Q. Would you turn to Exhibit Number Eight and identify that?

A. Okay. This is a graph showing the -- each of the four wells that are presently completed, Getty's wells completed in the Mesaverde on Mcf per day basis.

As you can see, they start out at a fairly decent rate per Mcf a day, but within nine months they've dropped of 60 percent. Production in this area, I do not believe, is very significant in the Mesaverde, as you can see by the rapid decline.

Q. Based upon your study of the geology, Ms. Peavey, in your opinion would a prudent operator complete these wells as a downhole commingled well or as a dual completion?

A. Based on the reserves in the Mesaverde and the Chacra, I believe the only way to do it would be to commingle the two zones.

Q. Do you have any opinion with regards to the spacing of the Mesaverde formation? I realize that some of the -- or all of the Getty wells to the north are spaced on 160 acres for Mesaverde. Is that a reasonable and logical spacing for the Mesaverde in this area?

A. I believe it is. First, the reserves that we're looking at are not significant with the rapid decline. 160 acres is sufficient to -- for drainage, and again, it lies about two and a half miles southeast of the existing Blanco Mesaverde where they found that the infills should be on 160's.

Q. From the information contained on Exhibit Number Eight, do you have any opinion as to any potential risk of cross flows because of the pressure differential between the Mesaverde and the Chacra formations?

A. I believe that the pressures are in agreement with each other. I don't think you will have cross flow. We do have about 200, 250 pounds pressure

higher in the Mesaverde; however, we don't anticipate encountering the same quality of rock in the Mesaverde, and I anticipate the pressures to be more like the Chacra is.

Q. If this area is developed as Tenneco proposes, with the Chacra and the Mesaverde on 160-acre dedication, will the ownership be common between the Mesaverde and the Chacra formations?

A. Yes, they will.

Q. If the Mesaverde is developed on 320's, would the ownership be in common?

A. No, they would not.

Q. Would you turn to Exhibit Number Nine and Exhibit Number Ten and discuss those two exhibits?

A. Okay. This is the gas analysis on the Hanley B No. 1. For the first Exhibit Number Nine is for the Chacra. Exhibit Number Ten is for the Mesaverde. And as you can see, the BTU's are not that different. The Chacra is 1173 and the Mesaverde is 1274.

Q. Based upon your study of the gas analysis of the Getty Well, do you have an opinion as to whether the gas composition of the two formations are compatible with each other?

A. I believe they're compatible.

Q. Were Exhibits One through Ten prepared by you directly, except for the information from the Getty

wells, compiled under your direction and supervision?

A. Yes, they were.

Q. And where did you obtain the gas analysis on the Getty wells?

A. From El Paso, who had approval to release them from Getty.

Q. In your opinion, Ms. Peavey, will approval of this application be in the best interests of conservation, the prevention of waste, and the protection of correlative rights?

A. I believe it will.

MR. KELLAHIN: That concludes our examination of this witness.

CROSS EXAMINATION

BY MR. STAMETS:

Q. Ms. Peavey, let's just take, for example, Section 19. You show two wells there on your Exhibit Number Two, one is just simply a dot and the other is a dot with a circle around it. I believe that you indicated that ones with the circles are infill wells in the Dakota?

A. Right.

Q. And would that mean that the other well that is just a single dot is the original Dakota well?

A. No. The single dot is where we propose

the Mesaverde-Chacra commingling; however, it is also the same core section where we have an existing Dakota well.

Q. I see, so the original Dakota well is not shown on this particular map?

A. Right, yes, sir.

Q. And each one of these wells that we've discussed here will be a new well drilled?

A. Uh-huh.

Q. Okay. So the single dots will only be Mesaverde-Chacra downhole commingles.

A. Right.

Q. And then the other five wells will be dualed and commingled.

A. Uh-huh.

MR. STAMETS: Will your next witness talk about an allocation?

MR. KELLAHIN: Yes.

MR. STAMETS: Okay.

Q. You've indicated in a couple of cases that we're talking about pressures, say, 1000 pounds, 1100 pounds, in the Chacra, and maybe 1200 pounds in the Mesaverde. Do you anticipate that that will be true over this entire area?

A. I believe for the most part our Mesaverde that we will encounter will not be -- the development of

the Mesaverde is not as well developed as it is in Getty's wells, so our pressures, I believe, will probably be somewhat lower and more in agreement with the Chacra.

Q. Do you anticipate any liquid production from either of the two zones, the Chacra or the Mesaverde?

A. At the time the four Getty wells, they are making some condensate. On the average it's 3 to 4 barrels of condensate a day.

Q. Do you feel that would be any problem in producing these wells?

MR. STAMETS: Will the next witness address that?

MR. KELLAHIN: Our next witness will talk of that.

MR. STAMETS: Any other questions of this witness? She may be excused.

PAUL A. DOYLE

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

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

A. My name is Paul Anthony Doyle. I'm employed by Tenneco Oil Company, and I'm a Senior Production Engineer.

Q. Mr. Doyle, have you previously testified before the Oil Conservation Division?

A. No, I have not.

Q. Will you describe for the Examiner when and where you obtained your degree?

A. I graduated from Georgia Tech with a Bachelor in Science in civil engineering in 1975.

Q. Subsequent to graduation where have you been employed in the oil and gas industry?

A. I worked for Texaco for two years in Craig, Colorado, as a production engineer. After that I have worked for Tenneco for three years out of their Denver office, as a production engineer.

Q. Pursuant to your duties as a production engineer, have you made a study of the facts surrounding this particular application?

A. Yes, I have.

MR. KELLAHIN: We tender Mr. Doyle as an expert petroleum engineer.

MR. STAMETS: He is considered qualified.

MR. KELLAHIN: Production engineer.

Q. Would you refer to what we've marked as

Exhibit Number Eleven and describe for us how the proposed Mesaverde-Chacra commingled wells are going to be drilled and completed?

A. See, on these type wells we plan to drill a 250-foot hole with 12-1/4 inch bit and set surface pipe cementing over this area. Then we plan to drill through the Chacra formation at about approximately to a depth of approximately 3100 feet with mud and set 7-inch casing through this zone. We then plan to drill out below the 7-inch, through the Mesaverde formation to a depth of approximately 4500 feet, with gas, log the well, and set a 4-1/2 inch liner and cement it in place over the Chacra formation.

Inasfar as our completion is concerned, we plan to drill the well out to the total depth, perforate, acidize, and frac the Mesaverde formation, and we plan to do this in only one stage because we do not feel that it would be sufficient development to frac in two stages, which we have done in the past, because of such thick net pays.

We then plan to run our tubing back in the hole, clean the well out, let the -- return the frac fluid, and shut the well in for eight days and run an AOF test on the Mesaverde formation.

We then plan to pull -- clear the well, pull the tubing, set our retrievable bridge plug between the Chacra and the Mesaverde, complete the Chacra formation

by perforating, acidizing, and fracing this zone. Then plan to clean -- then we plan to retrieve our retrievable bridge plug, clean up both zones, and run an AOF test on the combined Mesaverde-Chacra well.

Q. While we're talking about how you're going to complete these zones, describe for us how you would propose to come up with a method of allocating the production between the Chacra and the Mesaverde formations?

A. We plan to do this in a similar method as we've done with Farmington -- with Fruitland-Pictured Cliffs, where we will AOF the first well -- the first zone in the well, which is the Mesaverde formation, get that AOF, then complete the well in the Chacra, and then AOF the well in both -- with both the Chacra and Mesaverde zones producing, giving us an AOF of the cumulative zones between them.

With the information from both zones and the information from one zone, by subtracting the first AOF from the second, we'll get an implied AOF in the Chacra formation, and we plan to use this AOF to allocate production between zones.

Q. Tenneco has used that method for determining allocation between commingled zones in other wells?

A. Yes, sir. The example of this is our recent method that we used between the Fruitland and the

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Pictured Cliffs formations, which is a similar circumstance, where the Fruitland in that case, as the Mesaverde in this case, was a relatively weak producer, and we felt that it would be necessary just for prudent operating to have the wells commingled to make sure that that would keep -- keep the Fruitland producing, and this is the method we used on these wells, and this is what we propose to do here.

Q. Was the method of completion on the Fruitland-Pictured Cliffs commingled production one approved by the Oil Conservation Division?

A. Yes, sir, it was.

Q. Would you turn to Exhibit Number Twelve and identify that schematic for us?

A. This is a downhole schematic of our proposed Mesaverde-Chacra commingled wells, showing a 9-5/8ths casing set through 200 to 250 feet; 7-inch casing set through 3100 feet, and a 4-1/2 inch liner set from 2900 feet to 4500 feet, and both zones will be produced up 2-3/8ths tubing, set approximately the top of the Mesaverde formation.

Q. Let me address a question to you that was asked of the last witness. What, if any, liquids are produced from either of these zones?

A. We do not anticipate significant liquid production as far as condensate is concerned. There is a

possibility, if the Mesaverde is a weaker producer, as was mentioned, that there may be some water production from the Mesaverde. We don't anticipate it being significant, but if it should become a problem in either zone, we feel the commingling of zones having a higher gas volume, because both zones will be coming up the same string of tubing, we feel that we'll get better removal of our liquids from the wellbore by commingling the wells.

Q. All right, let's turn to Exhibit Number Thirteen and have you talk about that exhibit, and in addition, at the same time, if you'll look at Exhibit Number Fourteen, which is the schematic. Go through your completion procedure for those wells that will also include dualing the Dakota.

A. Okay. These wells, again, we'll set 250 feet of surface pipe. Then we'll drill out with an 8-3/4 inch hole, using mud, drill through the Mesaverde to approximately 4500 feet. We'll then set 7-inch casing and cement the 7-inch casing in place with a two-stage cement job with a DV tool being placed just below the Chacra formation in order to cover that interval with cement.

After this is done we'll drill out below the 7-inch, through the Dakota formation to approximately 6400 feet, we'll run our logs, and we'll set 4-1/2 inch liner across the Dakota formation and cement it in place.

For our completion we will drill out to plug back total depth and then perforate and acidize and frac the Dakota formation in a manner similar to the method in which we complete all our Dakota wells in the San Juan Basin. We will flow this zone to clean up for a couple days. We will not run an AOF test at that time until the well has been completed and the tubing has been -- final tubing string has been landed in the Dakota.

But after we flow some of the water off the formation we'll set a Model F packer with an expendable plug above the Dakota formation, which will then isolate the Dakota formation.

We'll then perforate the Mesaverde formation, perforate, acidize, and frac the Mesaverde formation, clean it up, and flow the well until it is cleaned up. We will then shut it in for eight days, perform an AOF test on that zone.

After that is completed we'll set a retrievable bridge plug between the Chacra and Mesaverde, and we'll complete the Chacra by perforating, acidizing, and fracing the Chacra.

We'll then remove the retrievable bridge plug, flow both zones to clean up, and run an AOF test -- excuse me, at that time we'll run in the hole and land our long string in the MOdel F packer to produce the Dakota

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formation and we'll run in the hole and land our short string to produce the Mesaverde-Chacra up the short string.

Then flow the well to clean up in both zones; we'll then shut the well in and run an AOF test in the Dakota formation and in the commingled Chacra-Mesaverde formations.

Then next --

Q. If I understood you correctly, then the method for determining the allocation between the Chacra and the Mesaverde in those wells that also contain a dual with the Dakota will be the same way as you've done with the other five wells that do not contain Dakota production?

A. That is correct.

The next exhibit is just a schematic of the bottom hole assembly that we've just described with 9-5/8ths casing set to 250 feet, 7-inch casing set to 4500 feet, and a 4-1/2 inch liner set from 4300 feet to 6400 feet. In the 7-inch casing a DV tool will be placed at 2950 just below the Chacra formation to insure that we get cement both across the Mesaverde and the Chacra formations.

The well -- the Dakota formation will be produced through the Model F packer that will be set just above the Dakota formation and up the 2-3/8ths tubing. The Chacra and Mesaverde formation will be produced commingled through the 2-3/8ths tubing, that second string of 2-3/8ths

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tubing that we will set just above the Mesaverde formation.

MR. STAMETS: While we're on the subject of that string of tubing, your exhibit shows the Mesaverde tubing to be set above the DV tool at 2950 feet.

A. Yes, sir, that is incorrect.

MR. STAMETS: Okay.

A. Diagrammatically incorrect.

MR. STAMETS: Well, I'll fix my copy.

A. Thank you.

Q. Mr. Doyle, do you have an opinion as to whether or not the optimum spacing for the development of these ten wells in the Mesaverde is 160 acres?

A. Just from the fact that the ownership would be different between the wells, it would cause a problem if we were not spaced on 160, but as far as --

Q. Have you made any reserve calculations for each of the three zones which would demonstrate the profitability of any of those zones?

A. Yes, I have.

Q. All right. Let's look at Exhibit Number Fifteen, then, and have you explain how you reached those numbers.

A. Okay, the Exhibit Fifteen gives what we estimate to be the reserves to be produced from the three formations in this particular area.

For the Chacra formation we anticipate 170-million cubic feet. IN the Mesaverde formation we anticipate 160-million cubic feet, and for the Dakota formation we anticipate 1,350-million cubic feet.

Q. Would you summarize for us briefly what kind of data you used in order to get to those numbers?

A. Well, the way we achieved these numbers is we looked at the wells in the surrounding area, both the Chacra and the Mesaverde wells. We looked at the initial rates from these wells, how -- what the initial turn-on rates were for the wells, how much they produced. We looked at the decline curves for these wells to see just what kind of a decline percentage -- percentage decline they experienced every year, and what maybe their stabilized decline rate was at some point in time.

By then, having these initial productions and the decline rates for the Chacra and Mesaverde wells, we ran it through a computer simulator that gives you an estimated lifetime production history of the well, and cums up your ultimate recovery from the wells.

As far as the Dakota formation is concerned, the way we achieved these reserve numbers is there are other Dakota wells in the area that have extensive production histories, cumulative data, and anticipated ultimate cumulative data. The figure that we're using to achieve

reserves, to estimate reserves in our Dakota infills right now, is by taking the performance of these original wells and multiplying their production, and therefore, obviously, their cumulative production, by a factor of 60 percent, assuming that our infill wells will produce 60 percent of what the original wells have produced.

Q. Would you turn to Exhibit Number Sixteen and explain that exhibit for us?

A. Okay. In order to analyze the different options we had for recovering reserves from all three of what we felt were the potentially productive zones in this area, the Chacra, Mesaverde, and Dakota, we put together cost estimates for individual wells and even several different types of wells to see just how much these different types of wells would cost.

The first option that we have is a single completion in any one of the three zones and the costs on here are all given in thousands of dollars.

The Mesaverde, single Mesaverde completion in the area we estimated would cost $263,000.

A single Dakota completion would be $347,000.

And a single Chacra completion would be $140,000.

Q. Am I correct in assuming from the exhibit

that it is uneconomic to drill a single completion to test either the Mesaverde or the Chacra formation, based upon the reserve information you compiled?

A. Based upon the reserves, the costs of the wells, and the operating costs of the wells, these wells are uneconomic by Tenneco's standards, yes.

Q. Now, let's compare the costs of a dually completed Mesaverde and Chacra to a situation, as you propose, where those two zones are commingled.

A. Okay, well, going further on Exhibit Sixteen here, we estimated the costs of dualing the wells -- in making a dual completion without commingling; otherwise, with two strings of tubing and with a packer isolating the zones.

The dual Mesaverde-Dakota well we estimated would run $449,000.

The Mesaverde-Chacra dual well would run $349,000, and the Dakota-Chacra dual well would run $401,000.

Now, then we also analyzed the estimated cost of a well that was commingled, a commingled Chacra-Mesaverde well, and the costs we estimated for this was $327,000.

And then we also have the cost on here for the proposed -- the wells that we are proposing of the type where the Dakota is produced up one string of tubing

and then the Chacra and Mesaverde are commingled and the estimated cost for this type of well is $461,000.

Q. Let's focus for a moment on those five wells in which you do intend to test the Dakota.

Is there an acceptable way of completing a Dakota producer in such a fashion that you could -- I guess what I'm asking is, is it feasible to triple complete the well?

A. Well, I --

Q. To have a triple completion with the Dakota, Chacra, and Mesaverde?

A. In our opinion it's unfeasible to have a triple completion because of the requirement of having three strings of tubing in the hole and the size of the hole that you would have to drill for this makes the costs excessive to where we would not want -- we would not feasibly do anything like that.

We have approximately 500 wells in the San Juan Basin, Tenneco does, and close to ten percent of those wells are dually completed wells, and of those 500 wells we do not have any triple completions. We just consider it an unfeasible, unacceptable method of completing the wells, because it just creates operating problems and bottom hole difficulties become such plumbers headaches that they are just -- we consider them unfeasible.

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Q. All right. If the Division should deny your application to commingle the Mesaverde and Chacra formations, what would your alternative be?

A. Okay, if you'll look at the Exhibit Number Seventeen, the proposed completion costs for a well that is commingled in the Mesaverde and Chacra, is $327,000. The only -- the alternative to this method of completion is to dually complete the Chacra and Mesaverde. As we said, this has a cost of $349,000, or an additional cost of $22,000, and these additional costs stem from the necessity of installing a bottom hole packer to isolate the zones, an additional string of tubing, a dual wellhead, which is more expensive than a single wellhead, and having two separators on the surface, which is obviously more expensive than one separator.

And we've also -- we've run some economics on these two alternative cases, and that is shown in Exhibit Eighteen.

Q. All right, let's look at that.

A. Okay, the two types of wells are shown here, the commingled Mesaverde-Chacra and the dual Mesaverde-Chacra.

The after tax rate of return, the discounted profit, reserves that we expect, and the payout in years for each of these wells is presented.

The -- I'd like to point out on here this discounted profit number is for the 100 percent working interest, so for instance, if the well was only 50 percent ownership by Tenneco or another company, that you'd have to divide these numbers in half, but these economics are run with a working interest owner of 100 percent.

Okay, using your different intial expenses to complete the wells, as I said, it's $22,000 more expensive to complete the dual, and then using also, you have a more expensive operating cost, because,if you have a dual well, because of the fact that you have two separators on surface.

We again ran through a simulated history of these wells, looking at production expenses, and calculated what our rates of return would be on these wells.

The commingled Mesaverde-Chacra well had a rate of return,after tax rate of return of 22.6 percent, which is a number that Tenneco feels is acceptable for an investment at this time.

The dual completion had an after tax rate of return of 14 percent, which is a number that Tenneco feels is an unacceptable rate of return on any project with borrowing money for a capital investment at interest rates of -- in excess of 18 percent. We do not feel that 14 percent rate of return is an acceptable return on our money,

and we would not drill a well of this type.

Another thing that I think is significant on this exhibit is the fact that we feel the commingled well will produce an additional 30-million cubic feet of reserves because of the fact that when one zone gets weak and possibly starts producing liquids, it will -- between both zones coming up the tubing, the life of the well will just be longer. With the more efficient flow regime, we'll just be able to keep it on longer.

Q. All right, would you describe for us Exhibit Number Nineteen?

A. Okay. Exhibit Number Nineteen is our options, this time looking at the comparison of drilling -- well, our objective is to recover gas from all three zones.

One way in which we can do this is the way we have proposed, the first proposal here, which is dualing the Dakota with commingled Mesaverde-Chacra, for a cost of $461,000.

Should we want to recover the reserves from all the wells without -- without commingling those two zones, we would have several other alternatives that we could follow, and these are listed in Group Two there.

The first alternative, of course, would be to drill three single completions. Now this would cost $750,000. Both the Mesaverde and the Chacra under our econ-

omic standards are uneconomic, so this is not what we -- this is not really a consideration for us.

A more feasible consideration, as far as costs are concerned, would be the next three options, and this is essentially, drill one dual well and one single completion, and I should also mention that these options would be considered far superior and of less cost than drilling a triple completion.

Q. But am I correct in understanding, under all the other alternatives, the total ultimate recovery from both the formations is going to be less than if they were commingled?

A. We believe that to be the case, yes.

The second alternative on here is to drill a dual Mesaverde-Dakota well, for a cost of $449,000, and drill a single Chacra well for $140,000, for a total cost of $589,000. This would be $128,000 more expensive than our initial alternative, but because of the fact that the Chacra well is economically unfeasible, we would not drill that well, and therefor, we would not recover the reserves in that zone.

The third alternative is to drill a dual Mesaverde-Chacra well and a single Dakota well, with the dual Mesaverde-Chacra well costing $349,000 and the single Dakota, $347,000, total cost would be $696,000, which again

is -- which is $235,000 more expensive than our initial alternative.

But again in case three, we have a dual Mesaverde-Chacra well, which I have just showed on the previous page, only has a rate of return of 14 percent, which we consider unacceptable, so we would not drill a well of that type.

The fourth alternative is to drill one -- to drill a dual Dakota-Chacra well for $401,000, and then a single Mesaverde well for $263,000. That would give you a total cost of $664,000, which is $203,000 more than our initial -- than our proposed alternative, but again here we would have a single Mesaverde well, which is far from being anywhere near economically acceptable with what we believe the reserves to be, and we would not drill a well of that type, and therefor, we would not recover any reserve from the Mesaverde in that alternative.

Q. Were Exhibits One -- I'm sorry, Exhibits Eleven through Nineteen prepared by you or compiled under your direction?

A. Yes.

Q. And in your opinion, Mr. Doyle, will approval of this application be in the best interests of conservation, the prevention of waste, and the protection of correlative rights?

A. Yes.

MR. KELLAHIN: We move the introduction of Exhibits One through Nineteen.

MR. STAMETS: These exhibits will be admitted.

Any questions of this witness?

MR. PADILLA: I have.

CROSS EXAMINATION

BY MR. PADILLA:

Q. Mr. Doyle, on Exhibit Eighteen you were comparing the after tax rate of return. I believe you testified that the 14 percent rate of return would be unacceptable because of your interest costs.

If that is an after tax rate of return would you have already taken into account your interest costs?

A. I don't really understand the question. Now, if the -- the after tax -- I believe the answer to the question is no. We do not consider, you know, in our economic evaluations we do not consider the, you know, the 18 percent cost of that money. We do discount the money that we have to -- that we spend. All our economics are discounted to present value of 10 percent, but as far as the cost of borrowing the money, we -- we have a present value,

I would say, of the money, but there is no value pre-tax, you know, there is no cost figured in for the -- for the cost of capital, no, that is not in the economic analysis as we run them.

I don't know if that really answered your question.

Q. Well, I don't know, it just seems to me thatin computing your tax you would be deducting the interest cost.

A. No, we are not.

Q. In arriving at a net --

A. No, in this particular computer simulation we do not.

Q. Then this really isn't an after tax rate of return, is it?

A. Okay, well, we -- when we go through this computer program, it takes a net lease operating income, or profit, from each year, and then it takes Federal income tax from that, and that is subtracted from our cash flow. That is how that after tax comes out. It's a reduction in our profitability because of Federal taxes. That's where our tax consideration comes in.

MR. PADILLA: Okay. Mr. Kellahin, did anyone testify as to whether the nature of the ownership in each of the commingled -- or proposed commingled zones?

MR. KELLAHIN: Yes, Ms. Peavey did. She indicated that if the Mesaverde is continued to be developed on 160 acres, and a Chacra 160-acre unit is dedicated, that the interest between the two zones is common.

The only time the interest is different is if the Mesaverde is developed on 320, and then we have a problem. We couldn't downhole commingle because of the difference in ownership.

MR. PADILLA: No further questions.

MR. STAMETS: The witness may be excused. Anything further in this case?

The case will be taken under advisement.

(Hearing concluded.)

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REPORTER'S CERTIFICATE

I, SALLY W. BOYD, C. S. R., DO HEREBY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division was reported by me; that the said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability.

Sally W. Boyd C.S.R.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 6847 heard by me on 3-26, 1980.

Richard L. Stamets, Examiner
Oil Conservation Division

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STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

LARRY KEHOE
SECRETARY

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87501
(505) 827-2434

April 17, 1980

Re: CASE NO. 6847
ORDER NO. R-6313

Applicant:

Tenneco Oil Company

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

Dear Sir:

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

Yours very truly,

JOE D. RAMEY
Director

JDR/fd

Copy of order also sent to:

Hobbs OCD x
Artesia OCD x
Aztec OCD x

Other _____

29-10

C - 19 no dual
N - 19 to be dualled
A - 30 " "
D - 30 no dual

29-11

G-24 to be dualled
O-24 no dual
A-25 to be dualled
D-25 no dual
M-25 to be dualled
P-25 no dual

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:

CASE NO. 6847
Order No. R-6313

APPLICATION OF TENNECO OIL COMPANY FOR DUAL COMPLETIONS AND DOWNHOLE COMMINGLING, SAN JUAN COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 9 a.m. on March 26, 1980, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 15th day of April, 1980, the Division Director, 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 Division has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Tenneco Oil Company, seeks authority to dually complete, in such a manner as to produce gas from the Dakota formation and commingled Chacra and Mesaverde production through parallel strings of tubing, ten proposed wells to be located as follows:

in Township 29 North, Range 10 West: Unit C, Section 19; Unit N, Section 19; Unit A, Section 30; and Unit D, Section 30; in Township 29 North, Range 11 West: Unit G, Section 24; Unit O, Section 24; Unit A, Section 25; Unit D, Section 25; Unit M, Section 25; and Unit P, Section 25.

(3) That at the hearing the applicant amended the subject application to eliminate the request for dual completion of the commingled Chacra/Mesaverde zones with the Dakota zone for five of the proposed wells to be located as follows:

in Township 29 North, Range 10 West: Unit C, Section 19 and Unit D, Section 30; in Township 29 North, Range 11 West: Unit O, Section 24; Unit D, Section 25; and Unit P, Section 25.

(4) That the Chacra and Mesaverde zones in each of the ten wells proposed to be drilled are expected to be capable of low rates of production.

(5) That the proposed commingling may result in the recovery of additional hydrocarbons from each of the subject pools, thereby preventing waste, and will not violate correlative rights.

(6) That the reservoir characteristics of each of the subject zones are such that underground waste would not be caused by the proposed commingling provided that any such well is not shut-in for an extended period.

(7) That to afford the Division the opportunity to assess the potential for waste and to expeditiously order appropriate remedial action, the operator should notify the Aztec district office of the Division any time any of the subject wells is shut-in for 7 consecutive days.

(8) That in order to allocate the commingled production to each of the commingled zones in the wells, applicant should consult with the supervisor of the Aztec district office of the Division and determine an allocation formula for each of the production zones.

(9) That the mechanics of the proposed dual completions are feasible and in accord with good conservation practices.

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

IT IS THEREFORE ORDERED:

(1) That the applicant, Tenneco Oil Company, is hereby authorized to commingle Chacra and Mesaverde production within the wellbore of ten proposed wells to be located as follows:

In Township 29 North, Range 10 West: Unit C, Section 19; Unit N, Section 19; Unit A, Section 30; and Unit D, Section 30; in Township 29 North, Range 11 West: Unit G, Section 24; Unit O, Section 24; Unit A, Section 25; Unit

D, Section 25; Unit M, Section 25; and Unit P, Section 25; all in San Juan County, New Mexico.

(2) That the applicant is further authorized to dually complete in such a manner as to produce gas from the commingled Chacra and Mesaverde zones and gas from the Dakota zone five of said wells located as follows:

in Township 29 North, Range 10 West: Unit N, Section 19; Unit A, Section 30; in Township 29 North, Range 11 West: Unit G, Section 24; Unit A, Section 25; and Unit M, Section 25, each of said wells being equipped with parallel strings of tubing and a packer between the commingled zones and the Dakota.

PROVIDED HOWEVER, that the applicant shall complete, operate, and produce said wells in accordance with the provisions of Rule 112-A of the Division Rules and Regulations insofar as said rule is not inconsistent with this order;

PROVIDED FURTHER, that the applicant shall take packer leakage tests upon completion and annually thereafter during the Deliverability Test Period for gas wells in Northwest New Mexico.

(3) That the applicant shall consult with the Supervisor of the Aztec district office of the Division and determine an allocation formula for the allocation of production to each zone in each of the subject wells.

(4) That the operator of the subject wells shall immediately notify the Division's Aztec district office any time any of the commingled wells has been shut-in for 7 consecutive days and shall concurrently present, to the Division, a plan for remedial action.

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

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

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

JOE D. RAMEY
Director

S E
fd/

STATE OF NEW MEXICO

DEPARTMENT OF ENERGY AND MINERALS

OIL CONSERVATION DIVISION

MARCH 26, 1980

EXHIBITS

TENNECO OIL COMPANY
1980 BLOOMFIELD AREA DRILLING PROGRAM
WELL SUMMARY

CHACRA-MESA VERDE-DAKOTA WELLS

WELL	LOCATION
1. Marquis G. Eaton A1E	NE-25-29-11
2. Elvin J. Payne A1E	SW-19-29-10
3. Sullivan Frame Gas A1E	NE-30-29-10
4. Sullivan Gas A1E	SW-25-29-11
5. Valdez Gas A1E	NE-24-29-11

CHACRA-MESA VERDE WELLS

WELL	LOCATION
1. Bunce Com 1	NW-29-29-10
2. Eaton Com B-1	SW-25-29-11
3. Bruce Sullivan Com B-1	NW-25-29-11
4. Sullivan Frame Com B-1	NW-30-29-10
5. Valdez Com B-1	SE-24-29-11

PAD 3/21/80

TYPE LOG

CHACRA FM.

GETTY OIL COMPANY
HANLEY B#1

SW/4 SEC. 18, T29N-R10W

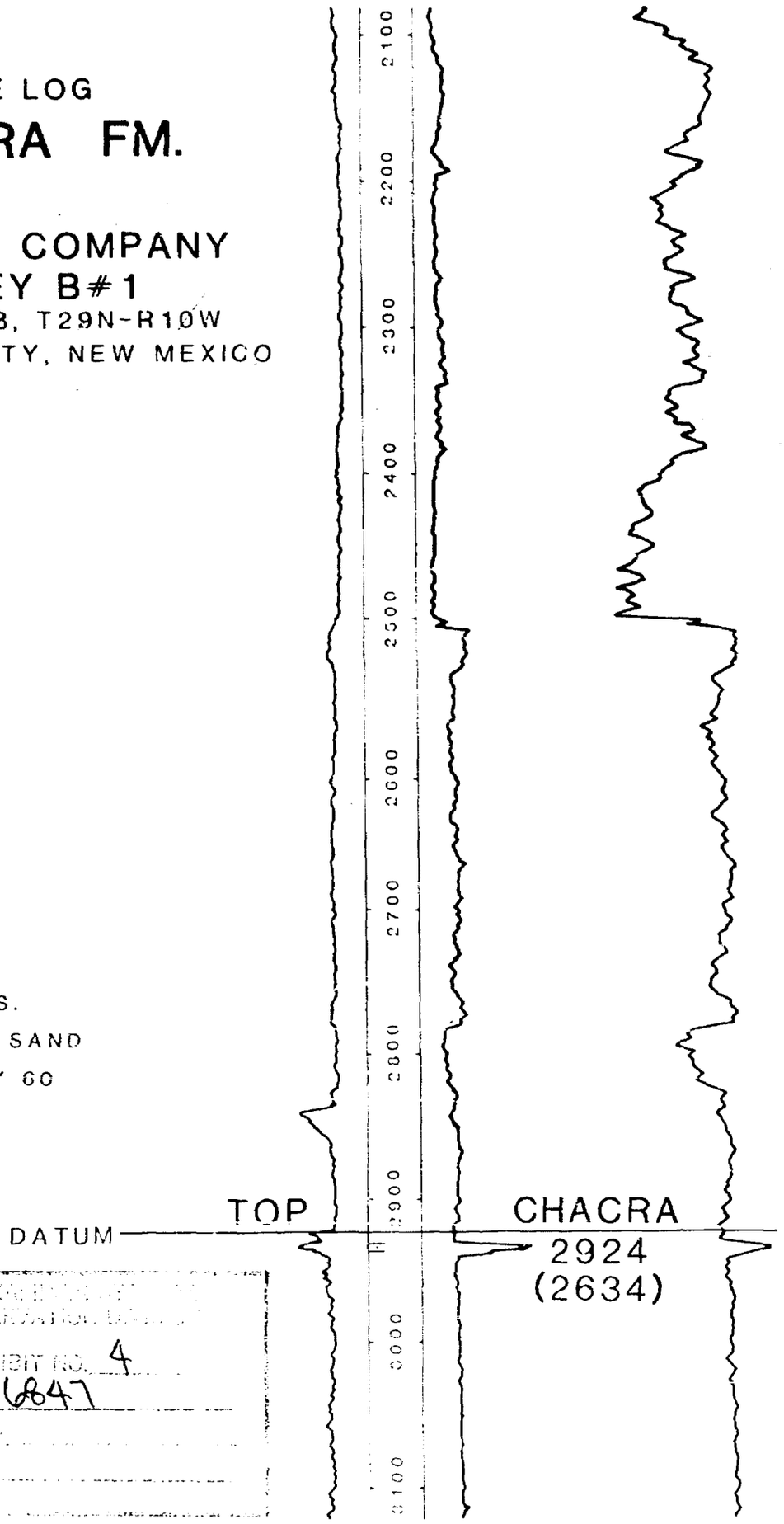
SAN JUAN COUNTY, NEW MEXICO

IPF: 791 MCFD
48/64 CK

PERF: 2932-38

SWFR 21,000 GALS.
30,000 LBS. SAND

TP 46, CP 290, GTY 60



API-ASL 396

API DATE 09 13 79
ANAL DATE 09 17 79

Betty Ch.

TYPE CODE	SAMPLE DATE	[illegible] DATE	[illegible]	[illegible]	[illegible]
00	09 13 79	09 14 79		1	

	MOLE %	GPM
C O 2	00.21	0.000
H 2 S	00.000*	0.000
N2	00.27	0.000
METHANE	88.37	0.000
ETHANE	07.13	1.905
PROPANE	02.91	0.933
ISO-BUTANE	00.47	0.179
NORM-BUTANE	00.62	0.230
ISO-PENTANE	00.23	0.084
NORM-PENTANE	00.19	0.065
HEXANE PLUS	00.41	0.179
TOTALS	100.00	3.584

SPECIFIC GRAVITY [illegible]

MIXTURE HEATING VALUE
(BTU/CF @ 14.73 PSIA,60 DEGREES, DRY) 1171

RATIO OF SPECIFIC HEATS [illegible]
* NO TEST SECURED FOR DETERMINATION [illegible]

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Getty M.V.

CO2		
H2S		
N2		
METHANE		
ETHANE		
PROPANE		1.618
ISO-BUTANE		0.283
NORM-BUTANE	01.23	0.369
ISO-PENTANE		0.141
NORM-PENTANE		0.101
HEXANE PLUS		0.227
TOTALS	100.00	3.708

SPECIFIC GRAVITY 0.731

MIXTURE HEATING VALUE
(BTU/CF @ 14.73 PSIA,60 DEGREES,DRY) 1374

RATIO OF SPECIFIC HEATS 1.078
* NO TEST SECURED FOR DETERMINATION AS CONTENT

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TENNECO OIL COMPANY
1980 BLOOMFIELD AREA DRILLING PROGRAM
DRILLING AND COMPLETION PROCEDURE
COMMINGLED MESA VERDE-CHACRA WELLS

DRILLING

1. Drill 12-1/4" hole to 250'.
2. Set 9-5/8" casing and cement to surface.
3. Drill 8-3/4" hole thru Chacra to ≈ 3100'.
4. Set 7" csg and cement to surface.
5. Drill 6-1/4" hole thru Mesa Verde to ≈ 4500'.
6. Run open hole logs over Mesa Verde and cased hole logs over Chacra.
7. Set 4-1/2" liner from 4500' to 2900'.
8. Cement liner in place.

COMPLETION

1. Drill out to plug back total depth.
2. Perforate Mesa Verde (≈ 50') with 2 shots per foot.
3. Acidize Mesa Verde with 1000 gals 15% HCL and ball sealers.
4. Frac Mesa Verde with 175,000# 20/40 sand in 1% KCl water.
5. Set retrievable bridge plug between Chacra and Mesa Verde.
6. Perforate Chacra (≈ 10') with 2 shots per foot.
7. Acidize Chacra with 500 gals 15% HCL and ball sealers.
8. Frac Chacra with 30,000# 10/20 sand in 70% quality foam.
9. Retrieve bridge plug.
10. Land tubing above Mesa Verde perforations.
11. Flow well to cleanup frac fluid.
12. Shut-in well for AOF test.

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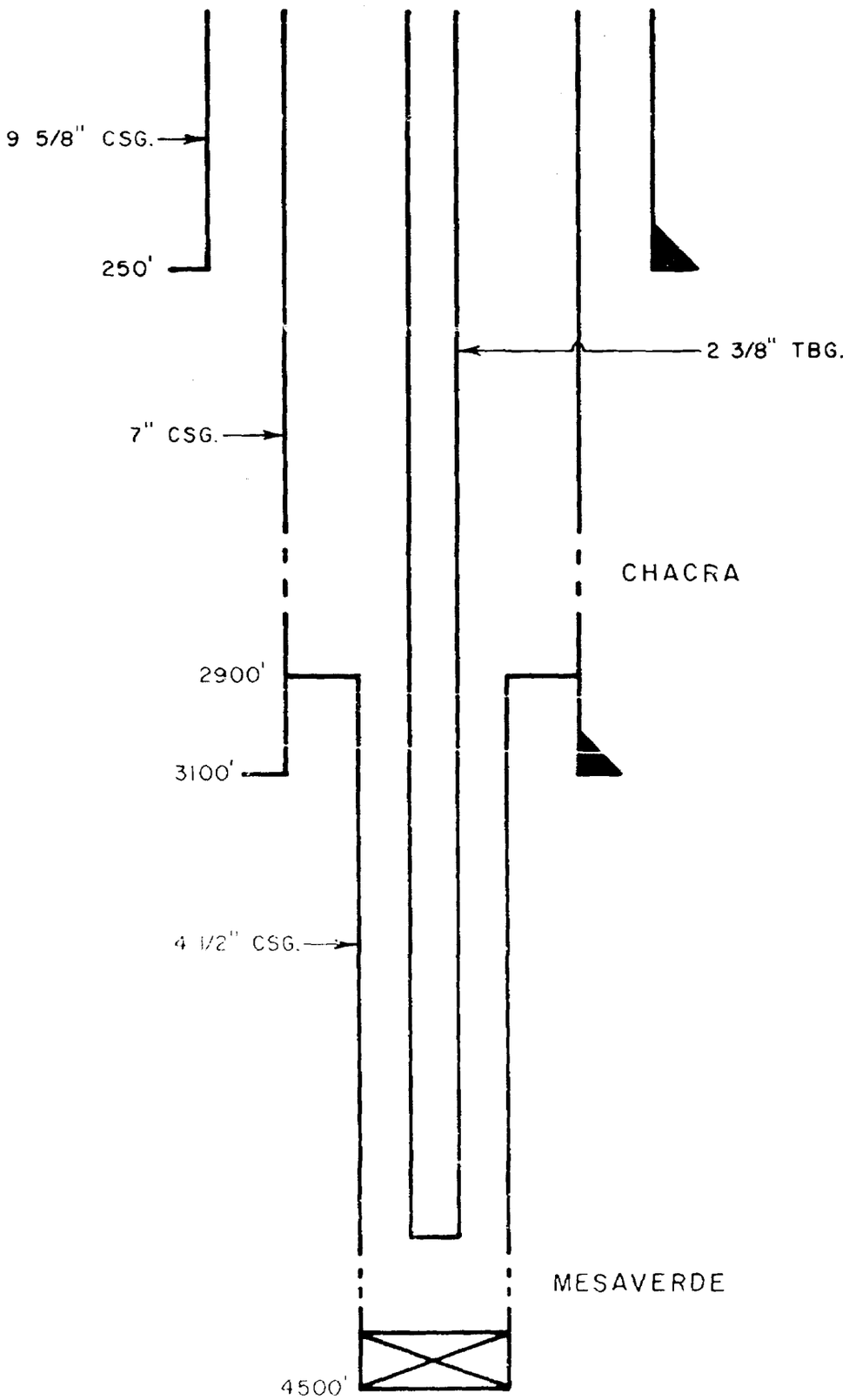
TENNECO OIL COMPANY

BLOOMFIELD AREA

T 29 N - R 10 & 11 W

SAN JUAN COUNTY, NEW MEXICO

MESAVERDE - CHACRA COMINGLED WELLBORE SCHEMATIC



TENNECO OIL COMPANY
1980 BLOOMFIELD AREA DRILLING PROGRAM
DRILLING AND COMPLETION PROCEDURE
DAKOTA DUALED WITH COMMINGLED CHACRA-MESA VERDE

DRILLING

1. Drill 12-1/4" hole to 250'.
2. Set 9-5/8" csg and cement to surface.
3. Drill 8-3/4" hole thru Mesa Verde to ≈ 4500'.
4. Set 7" csg and cement to surface using 2 stage cement job with DV tool at 2950'
5. Drill 6-1/4" hole thru Dakota to ≈ 6400'.
6. Run open hole logs over Dakota and cased hole log in 4-1/2" casing.
7. Set 4-1/2" liner from 6400' to 4300'.
8. Cement liner in place.

COMPLETION

1. Drill out to plug back total depth.
2. Perforate Dakota (≈ 50') with 2 shots per foot.
3. Acidize Dakota with 1500 gals 15% HCL and ball sealers.
4. Frac Dakota with 105,000# sand in 30# cross-linked gelled water.
5. Set Model "F" packer with expendable plug above Dakota.
6. Perforate Mesa Verde (≈ 50') with 2 shots per foot.
7. Acidize Mesa Verde with 1000 gals 15% HCL and ball sealers.
8. Frac Mesa Verde with 175,000# 20/40 sand in 1% KCl water.
9. Set retrievable bridge plug between Chacra and Mesa Verde.
10. Perforate Chacra (≈ 10') with 2 shots per foot.
11. Acidize Chacra with 500 gal 15% HCL and ball sealers.
12. Frac Chacra with 30,000# 10/20 sand in 70% quality foam.
13. Retrieve bridge plug.
14. Run in hole and land Dakota tubing string in Model "F" packer.
15. Run in hole and land Mesa Verde-Chacra tubing string above Mesa Verde.
16. Flow well to cleanup frac fluid.
17. Shut-in well for AOF test.

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PAD 3/21/80

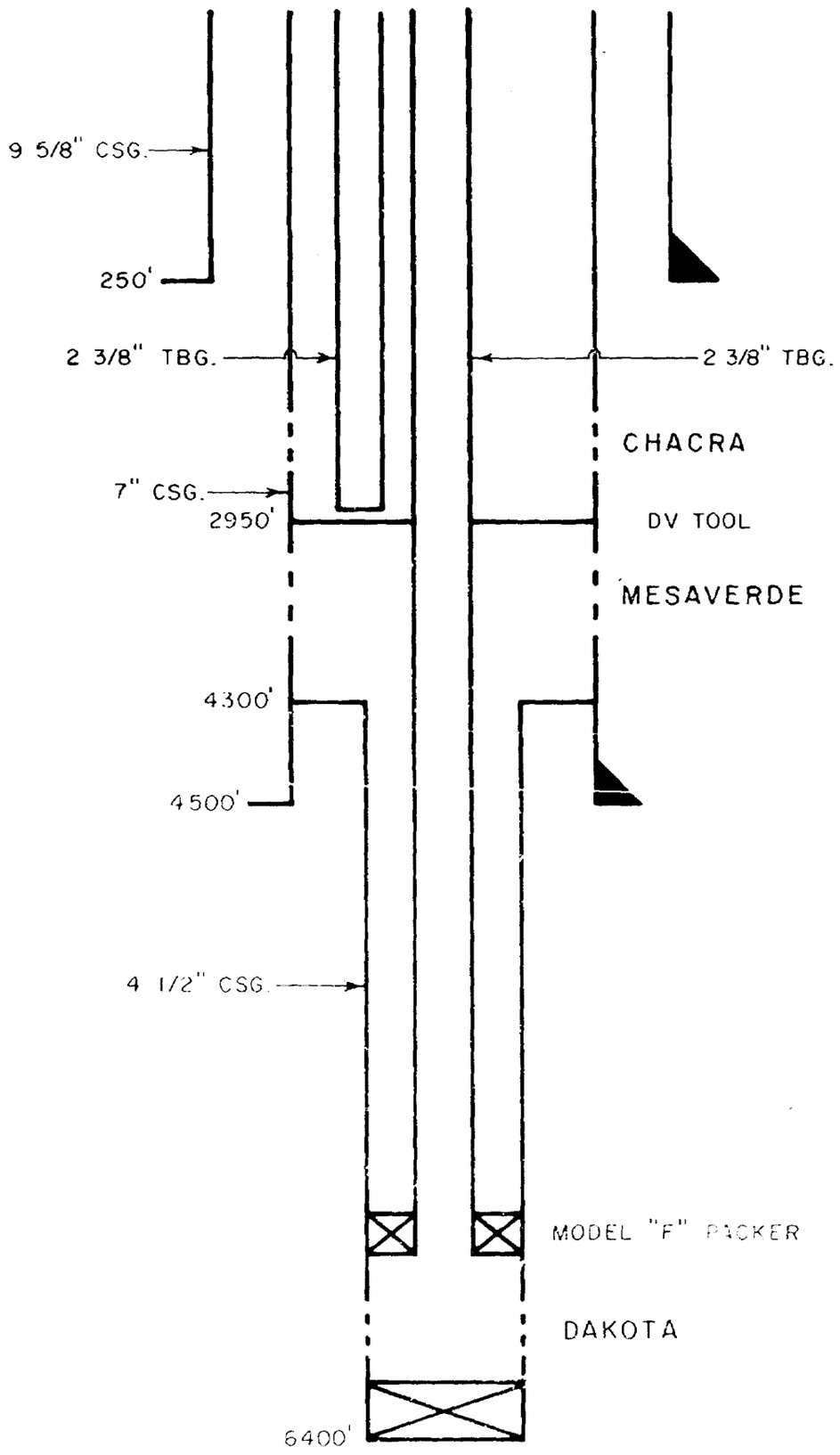
TENNECO OIL COMPANY

BLOOMFIELD AREA

T 29 N - R 10 & 11 W

SAN JUAN COUNTY, NEW MEXICO

DAKOTA DUAL WITH MESAVERDE - CHACRA COMINGLED WELLBORE SCHEMATIC



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TENNECO OIL COMPANY
1980 BLOOMFIELD AREA DRILLING PROGRAM
ESTIMATED GROSS RESERVES

ZONE	RESERVES (MMCF)
Chacra	170
Mesa Verde	160
Dakota	1350

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TENNECO OIL COMPANY
1980 BLOOMFIELD AREA DRILLING PROGRAM
ALTERNATIVE COST SUMMARY

TYPE WELL	TOTAL COST ($M)
Single Completion	
Mesa Verde	263
Dakota	347
Chacra	140
Duals Without Commingling	
Dakota-Mesa Verde	449
Mesa Verde-Chacra	349
Dakota-Chacra	401
Commingled Charca-Mesa Verde	
Mesa Verde-Chacra	327
Three Zones With Two Commingled	
Dakota Dualed with Chacra & Mesa Verde Commingled	461

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TENNECO OIL COMPANY
1980 BLOOMFIELD AREA DRILLING PROGRAM
WELLS WITH MESA VERDE AND CHACRA POTENTIAL
COST COMPARISON

I. Proposed Completion-Commingle Zones

Cost: $327,000

II. Alternative Without Commingling

Alternative	Cost	Cost Over Commingled Alternative ($M)
1. Dually Complete Chacra & Mesa Verde	349	22

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PAD 3/21/80

TENNECO OIL COMPANY
1980 BLOOMFIELD AREA DRILLING PROGRAM
ECONOMIC SUMMARY
MESA VERDE-CHACRA WELL

TYPE WELL	AFTER TAX RATE OF RETURN (%)	DISCOUNTED PROFIT @10% (M$)	RESERVES (MMCF)	PAYOUT (YEARS)
COMMINGLED				
Mesa Verde-Chacra	22.6	80.9	360	3.2
DUAL				
Mesa Verde-Chacra	14.0	28.6	330	3.9

EXHIBIT NO. 18
6847

TENNECO OIL COMPANY
1980 BLOOMFIELD AREA DRILLING PROGRAM
WELLS WITH CHACRA, MESA VERDE, AND DAKOTA POTENTIAL
COST COMPARISON

I. Proposed Completion-Dakota Dual With Mesa Verde & Charca Commingled

Cost: $461,000

II. Alternatives Without Commingling

Alternative	Cost	Cost Over Commingled Alternative ($M)
1. Drill 3 Single Completions	750	289
2. Drill 1 Dual MV-Dakota	449	-
Drill 1 Single Chacra	140	-
Total 2 Wells	589	128
3. Drill 1 Dual MV-Chacra	349	-
Drill 1 Single Dakota	347	-
Total 2 Wells	696	235
4. Drill 1 Dual Dakota-Chacra	401	-
Drill 1 Single Mesa Verde	263	-
Total 2 Wells	664	203

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6847

PAD 3/21/80

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
STATE LAND OFFICE BLDG.
SANTA FE, NEW MEXICO
26 March 1980

EXAMINER HEARING

IN THE MATTER OF:

Application of Tenneco Oil Company for dual completions and downhole commingling, San Juan County, New Mexico.

CASE 6847

BEFORE: Richard L. Stamets

TRANSCRIPT OF HEARING

A P P E A R A N C E S

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E X H I B I T S

MR. STAMETS: We'll call next Case 9947.

MR. PADILLA: Application of Tenneco Oil Company for dual completions and downhole commingling, San Juan County, New Mexico.

MR. STAMETS: Call for appearances in this case.

MR. KELLAHIN: Tom Kellahin of Santa Fe, New Mexico, appearing on behalf of the applicant, and I have two witnesses.

MR. STAMETS: I'd like to have them stand and be sworn, please.

(Witnesses sworn.)

CAROLYN PEAVEY

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. Would you please tell us your name, by whom you're employed, and in what capacity?

A. My name is Carolyn Peavey. I'm employed by Tenneco Oil Company and I'm a Senior Geological Engineer.

Q. Ms. Peavey, have you previously testified

before the Oil Conservation Division?

A. No, I have not.

Q. Will you describe for the Examiner when and where you obtained your degree?

A. I graduated in 1974 from Stephen F. Austin State University, it's in Nacogdoches, Texas, with a BS in geology.

Q. Subsequent to graduation where have you been employed as a geologist?

A. I spent four and a half years with Sun Oil Company and the first year and a half was as a research geophysicist; the next three years were as a production geologist, and then I joined Tenneco Oil Company a year and a half ago as a geological engineer, and as of December of this year I was a senior geological engineer.

Q. Pursuant to your employment as a geologist with Tenneco, have you made a study of and are you familiar with the geological facts surrounding this particular application?

A. Yes, I am.

MR. HALEY: We tender Ms. Peavey as an expert geologist.

MR. STAMETS: She is considered qualified.

Q. Would you please turn to what we've

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marked as Exhibits One, and I think it might be helpful if we also looked at the same time at Exhibit Number Two.

And, Ms. Peavey, if you'll begin your testimony by looking at Exhibit Number Two and identifying for us, first of all, how the wells you propose to complete as Chacra-Mesaverde downhole commingled wells, how those wells are identified and where they are located.

A. Okay. The Mesaverde-Chacra commingled are the locations that are just a single dot. That would be the northwest quarter of Section 19, Township 29 North, 10 West; the northwest quarter of Section 30, Township 29 North, 10 West; southeast quarter of Section 24, 29 North, 11 West; the northwest quarter of Section 25, 29 North, 11 West; and the southeast quarter of Section 25, 29 North, 11 West.

Q. And each of those five wells for which you propose a program for the downhole commingling of the Mesaverde and Chacra are identified specifically on Exhibit Number One, are they not?

A. Yes, they are, the first five wells, the second five wells.

Q. All right. What is identified by those wells with the well [illegible] around them, [illegible]?

A. Those are wells that we intend to drill to the Dakota and [illegible] the [illegible]-Chacra [illegible]

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mingled.

Q. Now let's start off with the spacing in the Chacra for this area. What will be the spacing for the Chacra wells?

A. The spacing on the Chacra is 160's.

Q. Okay. What is the spacing for each well to be completed in the Dakota formation?

A. Okay, they will be on 320's. The wells -- well, the -- it's 320 spacing now. Section 19 will be the west half, and the spacing in the well, the Dakota well in Section 30 will be in the north half. Going to Section 24, 29 North, 11 West, it will be the east half. Going to Section 25, it's split, east half/west half.

Q. All right. Now, the five Dakota wells involved, are these original Dakota wells on a proration unit or are these infill Dakota wells?

A. These will be infill wells.

Q. So on each of the five proration units there already exists an original Dakota producer.

A. This is true.

Q. And where would the Dakota producer be located?

A. They are at the -- located where the single dots are, where we propose to put the Mesaverde-Chacra completion wells. They're in the same quarter section.

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Q. All right. What is the spacing for the Mesaverde formation?

A. Right now the Mesaverde is in the undesignated Mesaverde and it will be on 160's.

Q. For the Examiner, where does this area lie in reference to the Blanco Mesaverde Pool?

A. It lies about two and a half miles southeast of the existing Blanco Mesaverde Pool.

Q. Are there any other wells in the immediate area located on Exhibit Number Two, which are operated by another operator and which produce either from the Chacra or Mesaverde formations?

A. No, all the wells that produce are on this map.

Q. All right, what about the Getty wells located to the north? What kind of wells are those?

A. Okay. Map 3, or your Exhibit Three, shows the existing Mesaverde completions. There are four of them at this time that I've included in the undesignated Mesaverde.

Q. Would you identify the four wells that are completed in the undesignated Mesaverde?

A. Okay, one is in the northeast quarter of Section 13, 29 North, 11 West, the Ute Park B No. 1.

The one in the northwest quarter of Sec-

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tion 18, 29 North, [illegible] West, is the [illegible] A No. 1.

The southwest quarter of Section 18, 29 North, 10 West, is the Hanley B No. [illegible]

And the Duntz A No. 1 is the one in the northeast quarter of Section 19, 29 North, 10 West.

Q Do any of those wells produce from any other formation other than the Mesaverde?

A They are at this time dualed with the Chacra.

Q Am I correct, I believe you've already said it, but am I correct in understanding that each of the Getty Wells are dedicated to 160-acre spacing and proration unit, dedicated to an undesignated Mesaverde formation?

A Yes, sir.

Q Would you now turn to what we've marked as Exhibit Number Four and have you identify that?

A Okay. Exhibit Number Four is the Hanley B No. 1. It is the well, Getty's well that is closest to our acreage in question. That is dualed in the Mesaverde and the Chacra. This is a type log of the Chacra. They encountered about 8 to 10 feet of pay with average porosity of 12 percent, and [illegible] percent. [illegible] shut-in casing pressure was [illegible].

Q [illegible] log

as a type log [illegible]

ject wells?

A. This well is the closest to Tenneco's acreage and I think -- I believe typifies what we will be encountering if we drill the well. We have a cross section, the next exhibit is the cross section of the Chacra.

Q. That's Exhibit Number Five?

A. Right.

Q. Let's look at that.

A. This is a southeast/northwest trending cross section. The type log is the well that is situated at A'. It extends southwest of Tenneco's acreage. As you can see, the Chacra is developed. We anticipate about 8 to 10 feet of pay in Tenneco's wells that we drill.

Q. Will you start with A and continue through A' and describe briefly each of the wells you've placed on your cross section?

A. Okay. Starting in the southwest quarter, we have the Delo No. 2 and it has two stringers that are developed in the Chacra. Estimated pay again is about 8 feet.

Moving towards the northeast we have the two stringers that are developed [illegible] with a slight shale indica[illegible] pay would be about 10 to 12 feet.

[illegible]

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[illegible] No. 1 we lose -- it appears we lose the resistivity in the first stringer, so production is probably only from the second stringer, and I anticipate a pay of about 6 to [illegible] feet.

Moving farther northeast, we do lose the first stringer and the second stringer is the production zone. Pay is about [illegible] feet.

And moving up to the Hanley B. No. 1 we have the first stringer again -- or second stringer again as production, and pay is about [illegible] feet.

Q Okay. Would you turn to what we've marked as Exhibit Number Six and discuss the characteristics of the Mesaverde formation encountered in this area?

A Okay, this is the Mesaverde formation. In this particular well, this is the Hanley B No. 1. The Point Lookout and the Menafee are the only two producing members of the Mesaverde.

Point Lookout had [illegible] feet of net pay and the Menafee had 32 feet of net pay, and the isolated stringers.

This well was perforated; initial potential was 2 barrels of condensate and [illegible] million cubic feet of gas a day. Shut-in [illegible] pressure [illegible] 1099.

Q [illegible] particular well a type log for the Mesaverde?

A [illegible] [illegible] that is [illegible]

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to Tenneco's acreage and [illegible] for what we may anticipate as far as [illegible] production.

Q Go to the cross section marked Exhibit Number Seven and describe for us generally the -- how the Mesaverde formation appears through the cross section?

A Starting from the northeast, we have the Hanley B No. 1. As we progress southwest we encounter -- we get up-dip of structure.

As you know, the Menafee is -- was a plutal (sic) depositional environment. Most of the sand developments are not continuous throughout the area. There are isolated sand stringers.

The Cliff House in the Hanley B No. 1 encountered about 10 feet of pay again, and most of the production, I believe, is coming from the Menafee where you have 32 feet of pay

As you move -- well, what is colored in this map in yellow is what I anticipate as being productive stringers, and what is in blue is what I calculated to be water productive.

As you move to the southeast, you're going up structure. You're encountering [illegible] of the stringers in the [illegible] due to hydrodynamics, and also probably due to the fact that the stringers are not [illegible].

Q. As a generalization, Mr. Bovay, which of the two zones is generally going to be the better producing formation in each of the subject wells?

A. Typically in the San Juan Basin the Point Lookout is; however, taking the Hanley B No. 1, the Menafee, I believe, is the main producing horizon from this, and I -- as you move farther southwest you do not see the Menafee as productive across Tenneco's acreage.

The interval of the Menafee is from about 3550 down to about 4100.

Q. As a geologist would you recommend to your management the drilling and testing of the Mesaverde formation alone in this area?

A. Not for the reserves that we see here, no.

Q. Would you turn to Exhibit Number Eight and identify that?

A. Okay. This is a graph showing the -- each of the four wells that are presently completed, Getty's wells completed in the Mesaverde on Mcf per day basis.

As you can see, they start out at a fairly decent rate per Mcf a day, but within nine months they've dropped at 60 percent. Production in this area, I do not believe, is very significant in the Mesaverde, as you can see by the rapid decline.

Q [illegible] of the geology, Ms. [illegible], in your opinion [illegible] operator complete these wells as a downhole commingled well or as a dual completion?

A Based on the reserves in the Mesaverde and the Chacra, I believe the only way to do it would be to commingle the two zones

Q Do you have any opinion with regards to the spacing of the Mesaverde formation? I realize that some of the -- or all of the Getty wells to the north are spaced on 160 acres for Mesaverde. Is that a reasonable and logical spacing for the Mesaverde in this area?

A I believe it is. First, the reserves that we're looking at are not significant with the rapid decline. 160 acres is sufficient to -- for drainage, and again, it lies about two and a half miles southeast of the existing Blanco Mesaverde where they found that the infills should be on 160's.

Q From the information contained on Exhibit Number Eight, do you have any opinion as to any potential risk of cross flows because of the pressure differential between the Mesaverde and the Chacra formations?

A [illegible] commingled with [illegible] will have cross flow. [illegible]

higher in the Mesaverde, [illegible] anticipate encountering the same [illegible] the Mesaverde, and I anticipate the pressure to be same like the Chacra is.

Q. If this gas is developed as Tenneco proposes, with the Chacra and the Mesaverde on 160-acre dedication, will the ownership be common between the Mesaverde and the Chacra formations?

A. Yes, they will.

Q. If the Mesaverde is developed on 320's, would the ownership be in common?

A. No, they would not.

Q. Would you turn to Exhibit Number Nine and Exhibit Number Ten and discuss those two exhibits?

A. Okay. This is the gas analysis on the Hanley B No. 1. For the first Exhibit Number Nine is for the Chacra. Exhibit Number Ten is for the Mesaverde. And as you can see, the BTU's are not that different. The Chacra is 1173 and the Mesaverde is 1174.

Q. Based upon your study of the gas analysis of the Getty Well, do you have an opinion as to whether the gas composition of the two formations are compatible with each other?

A. [illegible]

Q. [illegible]

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[illegible] on the Getty wells?

A. [illegible] approval to release them from Getty.

Q. In your opinion, Ms. Peavey, will approval of this application be in the best interests of conservation, the prevention of waste, and the protection of correlative rights?

A. I believe it will.

MR. WILLIAMS: That concludes our examination of this witness.

CROSS EXAMINATION

BY MR. STAMETS:

Q. Ms. Peavey, in the first case, for example, Section 19. You show two wells there on your Exhibit Number Two, one is just a dot by itself and the other is a dot with a circle around it. I believe you indicated that ones with the circles are [illegible]?

A. Right.

Q. [illegible]

A. [illegible]

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the Mesaverde-Chacra [illegible], it is [illegible] the same core section [illegible] Dakota well.

Q [illegible] the original Dakota well is not shown on this particular map?

A [illegible], sir.

Q [illegible] one of these wells that we've discussed here will be a new well drilled?

A Uh-huh.

Q Okay. So the single dots will only be Mesaverde-Chacra downhole commingles.

A Right.

Q And then the other five wells will be dualed and commingled.

A Uh-huh.

MR. STAMETS: Will your next witness talk about an allocation?

MR. [illegible]: Yes.

MR. STAMETS: Okay.

Q You've indicated in a couple of cases that we're talking about pressures, say, 1000 pounds, 1100 pounds, in the Chacra, [illegible] 12[illegible] pounds in the [illegible]. Do you anticipate [illegible] this [illegible]?

A [illegible] that we will [illegible] of

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the Mesaverde is not as well developed as it is in Getty's wells, so our pressures, I believe, will probably be somewhat lower and more in agreement with the Chacra.

Q Do you anticipate any liquid production from either of the two zones, the Chacra or the Mesaverde?

A At the time the four Getty wells, they are making some condensate. On the average it's 3 to 4 barrels of condensate a day.

Q Do you feel that would be any problem in producing these wells?

MR. STAMETS: Will the next witness address that?

MR. KELLAHIN: Our next witness will talk of that.

MR. STAMETS: Any other questions of this witness? She may be excused.

PAUL A. DOYLE

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

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

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A. My name is Paul Anthony Doyle. I'm employed by Tenneco Oil Company, and I'm a Senior Production Engineer.

Q. Mr. Doyle, have you previously testified before the Oil Conservation Division?

A. No, I have not.

Q. Will you describe for the Examiner when and where you obtained your degree?

A. I graduated from Georgia Tech with a Bachelor in Science in civil engineering in 1975.

Q. Subsequent to graduation where have you been employed in the oil and gas industry?

A. I worked for Texaco for two years in Craig, Colorado, as a production engineer. After that I have worked for Tenneco for three years out of their Denver office, as a production engineer.

Q. Pursuant to your duties as a production engineer, have you made a study of the facts surrounding this particular application?

A. Yes, I have.

MR. KELLAHIN: We tender Mr. Doyle as an expert petroleum engineer.

MR. [illegible]: He is considered qualified.

MR. KELLAHIN: Production engineer.

Q. Would you refer to what we've marked as

Exhibit Number Eleven and describe for us how the proposed Mesaverde-Chacra commingled wells are going to be drilled and completed?

A. See, on these type wells we plan to drill a 250-foot hole with 12-1/4 inch bit and set surface pipe cementing over this area. Then we plan to drill through the Chacra formation at about approximately to a depth of approximately 3100 feet with mud and set 7-inch casing through this zone. We then plan to drill out below the 7-inch, through the Mesaverde formation to a depth of approximately 4500 feet, with gas, log the well, and set a 4-1/2 inch liner and cement it in place over the Chacra formation.

Inasfar as our completion is concerned, we plan to drill the well out to the total depth, perforate, acidize, and frac the Mesaverde formation, and we plan to do this in only one stage because we do not feel that it would be sufficient development to frac in two stages, which we have done in the past, because of such thick net pays.

We then plan to run our tubing back in the hole, clean the well out, let the -- return the frac fluid, and shut the well in for eight days and run an AOF test on the Mesaverde formation.

We then plan to pull -- clean the well, pull the tubing, set our retrievable bridge plug between the Chacra and the Mesaverde, complete the Chacra formation

by perforating, acidizing, and fracing this zone. Then plan to clean -- then we plan to retrieve our retrievable bridge plug, clean up both zones, and run an AOF test on the combined Mesaverde-Chacra well.

Q While we're talking about how you're going to complete these zones, describe for us how you would propose to come up with a method of allocating the production between the Chacra and the Mesaverde formations?

A We plan to do this in a similar method as we've done with Farmington -- with Fruitland-Pictured Cliffs, where we will AOF the first well -- the first zone in the well, which is the Mesaverde formation, get that AOF, then complete the well in the Chacra, and then AOF the well in both -- with both the Chacra and Mesaverde zones producing, giving us an AOF of the cumulative zones between them.

With the information from both zones and the information from one zone, by subtracting the first AOF from the second, we'll get an implied AOF in the Chacra formation, and we plan to use this AOF to allocate production between zones.

Q Tenneco has used that method for determining allocation between commingled zones in other wells?

A Yes, sir. The example of this is our recent method that we used between the Fruitland and the

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Pictured Cliffs formations, which is a similar circumstance, where the Fruitland in that case, as the Mesaverde in this case, was a relatively weak producer, and we felt that it would be necessary just for prudent operating to have the wells commingled to make sure that that would keep -- keep the Fruitland producing, and this is the method we used on these wells, and this is what we propose to do here.

Q. Was the method of completion on the Fruitland-Pictured Cliffs commingled production one approved by the Oil Conservation Division?

A. Yes, sir, it was.

Q. Would you turn to Exhibit Number Twelve and identify that schematic for us?

A. This is a downhole schematic of our proposed Mesaverde-Chacra commingled wells, showing a 9-5/8th casing set through 200 to 250 feet; 7-inch casing set through 3100 feet, and a 4-1/2 inch liner set from 2900 feet to 4500 feet, and both zones will be produced up 2-3/8ths tubing, set approximately the top of the Mesaverde formation.

Q. Let me address a question to you that was asked of the last witness. What, if any, liquids are produced from either of these wells?

A. We do not anticipate significant liquid production as far as condensate is concerned. There is a

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possibility, if the Mesaverde is a weaker producer, as was mentioned, that there may be some water production from the Mesaverde. We don't anticipate it being significant, but if it should become a problem in either zone, we feel the commingling of zones having a higher gas volume, because both zones will be coming up the same string of tubing, we feel that we'll get better removal of our liquids from the wellbore by commingling the wells.

Q All right, let's turn to Exhibit Number Thirteen and have you talk about that exhibit, and in addition, at the same time, if you'll look at Exhibit Number Fourteen, which is the schematic. Go through your completion procedure for those wells that will also include dualing the Dakota.

A Okay. These wells, again, we'll set 250 feet of surface pipe. Then we'll drill out with an 8-3/4 inch hole, using mud, drill through the Mesaverde to approximately 4500 feet. We'll then set 7-inch casing and cement the 7-inch casing in place with a two-stage cement job with a DV tool being placed just below the Chacra formation in order to cover that interval with cement.

After this is done we'll drill out below the 7-inch, through the Dakota formation to approximately 6400 feet, we'll run our logs, and we'll set 4-1/2 inch liner across the Dakota formation and cement it in place.

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For our completion we will drill out to plug back total depth and then perforate and acidize and frac the Dakota formation in a manner similar to the method in which we complete all our Dakota wells in the San Juan Basin. We will flow this zone to clean up for a couple days. We will not run an AOF test at that time until the well has been completed and the tubing has been -- final tubing string has been landed in the Dakota.

But after we flow some of the water off the formation we'll set a Model F packer with an expendable plug above the Dakota formation, which will then isolate the Dakota formation.

We'll then perforate the Mesaverde formation, perforate, acidize, and frac the Mesaverde formation, clean it up, and flow the well until it is cleaned up. We will then shut it in for eight days, perform an AOF test on that zone.

After that is completed we'll set a retrievable bridge plug between the Chacra and Mesaverde, and we'll complete the Chacra by perforating, acidizing, and fracing the Chacra.

We'll then remove the retrievable bridge plug, flow both zones to clean up, and run an AOF test -- excuse me, at that time we'll go in the hole and land our long string in the Model F packer isolating the Dakota

formation and we'll run in the hole and land our short string to produce the Mesaverde-Chacra up the short string.

Then flow the well to clean up in both zones; we'll then shut the well in and run an MOF test in the Dakota formation and in the commingled Chacra-Mesaverde formations.

Then next --

Q. If I understood you correctly, then the method for determining the allocation between the Chacra and the Mesaverde in those wells that also contain a dual with the Dakota will be the same way as you've done with the other five wells that do not contain Dakota production?

A. That is correct.

The next exhibit is just a schematic of the bottom hole assembly that we've just described with 9-5/8ths casing set to 250 feet, 7-inch casing set to 4500 feet, and a 4-1/2 inch liner set from 4300 feet to 6400 feet. In the 7-inch casing a DV tool will be placed at 2930 just below the Chacra formation to insure that we get cement both across the Mesaverde and the Chacra formations.

The well -- the Dakota formation will be produced through the Model F packer that will be set just above the Dakota formation and up the 2-3/8ths tubing. The Chacra and Mesaverde formation will be produced commingled through the 2-3/8ths tubing, that second string of 2-3/8ths

tubing that we will set just above the Mesaverde formation.

MR. STAMETS: While we're on the subject of that string of tubing, your exhibit shows the Mesaverde tubing to be set above the DV tool at 2950 feet.

A. Yes, sir, that is incorrect.

MR. STAMETS: Okay.

A. Diagrammatically incorrect.

MR. STAMETS: Well, I'll fix my copy.

A. Thank you.

Q. Mr. Doyle, do you have an opinion as to whether or not the optimum spacing for the development of these ten wells in the Mesaverde is 160 acres?

A. Just from the fact that the ownership would be different between the wells, it would cause a problem if we were not spaced on 160, but as far as --

Q. Have you made any reserve calculations for each of the three zones which would demonstrate the profitability of any of those zones?

A. Yes, I have.

Q. All right. Let's look at Exhibit Number Fifteen, then, and have you explain how you reached those numbers.

A. Okay, the Exhibit Fifteen gives what we estimate to be the reserves to be produced from the three formations in this particular area.

For the Chacra formation we anticipate 170-million cubic feet. IN the Mesaverde formation we anticipate 160-million cubic feet, and for the Dakota formation we anticipate 1,350-million cubic feet.

Q Would you summarize for us briefly what kind of data you used in order to get to those numbers?

A Well, the way we achieved these numbers is we looked at the wells in the surrounding area, both the Chacra and the Mesaverde wells. We looked at the initial rates from these wells, how -- what the initial turn-on rates were for the wells, how much they produced. We looked at the decline curves for these wells to see just what kind of a decline percentage -- percentage decline they experienced every year, and what maybe their stabilized decline rate was at some point in time.

By then, having these initial productions and the decline rates for the Chacra and Mesaverde wells, we ran it through a computer simulator that gives you an estimated lifetime production history of the well, and cums up your ultimate recovery from the wells.

As far as the Dakota formation is concerned, the way we achieved these reserve numbers is there are other Dakota wells in the area that have extensive production histories, cumulative data, and anticipated ultimate cumulative data. The figure that we're using to achieve

reserves, to estimate reserves in our Dakota infills right now, is by taking the performance of these original wells and multiplying their production, and therefore, obviously, their cumulative production, by a factor of 60 percent, assuming that our infill wells will produce 60 percent of what the original wells have produced.

Q. Would you turn to Exhibit Number Sixteen and explain that exhibit for us?

A. Okay. In order to analyze the different options we had for recovering reserves from all three of what we felt were the potentially productive zones in this area, the Chacra, Mesaverde, and Dakota, we put together cost estimates for individual wells and even several different types of wells to see just how much these different types of wells would cost.

The first option that we have is a single completion in any one of the three zones and the costs on here are all given in thousands of dollars.

The Mesaverde, single Mesaverde completion in the area we estimated would cost $263,000.

A single Dakota completion would be $347,000.

And a single Chacra completion would be $149,000.

Q. Am I correct in assuming from the exhibit

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that it is uneconomic to drill a single completion to test either the Mesaverde or the Chacra formation, based upon the reserve information you compiled?

A. Based upon the reserves, the costs of the wells, and the operating costs of the wells, these wells are uneconomic by Tenneco's standards, yes.

Q. Now, let's compare the costs of a dually completed Mesaverde and Chacra to a situation, as you propose, where those two zones are commingled.

A. Okay, well, going further on Exhibit Sixteen here, we estimated the costs of dualing the wells -- in making a dual completion without commingling; otherwise, with two strings of tubing and with a packer isolating the zones.

The dual Mesaverde-Dakota well we estimated would run $449,000.

The Mesaverde-Chacra dual well would run $349,000, and the Dakota-Chacra dual well would run $401,000.

Now, then we also analyzed the estimated cost of a well that was commingled, a commingled Chacra-Mesaverde well, and the costs we estimated for this was $327,000.

And then we also have the cost on here for the proposed -- the wells that we are proposing of the type where the Dakota is produced up one string of tubing

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and then the Chacra and Mesaverde are commingled and the estimated cost for this type of well is $461,000.

Q Let's focus for a moment on those five wells in which you do intend to test the Dakota.

Is there an acceptable way of completing a Dakota producer in such a fashion that you could -- I guess what I'm asking is, is it feasible to triple complete the well?

A Well, I --

Q To have a triple completion with the Dakota, Chacra, and Mesaverde?

A In our opinion it's unfeasible to have a triple completion because of the requirement of having three strings of tubing in the hole and the size of the hole that you would have to drill for this makes the costs excessive to where we would not want -- we would not feasibly do anything like that.

We have approximately 500 wells in the San Juan Basin, Tenneco does, and close to ten percent of those wells are dually completed wells, and of those 500 wells we do not have any triple completions. We just consider it an unfeasible, unacceptable method of completing the wells, because it just creates operating problems and bottom hole difficulties become such plumbers headaches that they are just -- we consider that unfeasible.

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Q. All right. If the Division should deny your application to commingle the Mesaverde and Chacra formations, what would your alternative be?

A. Okay, if you'll look at the Exhibit Number Seventeen, the proposed completion costs for a well that is commingled in the Mesaverde and Chacra, is $327,000. The only -- the alternative to this method of completion is to dually complete the Chacra and Mesaverde. As we said, this has a cost of $349,000, or an additional cost of $22,000, and these additional costs stem from the necessity of installing a bottom hole packer to isolate the zones, an additional string of tubing, a dual wellhead, which is more expensive than a single wellhead, and having two separators on the surface, which is obviously more expensive than one separator.

And we've also -- we've run some economics on these two alternative cases, and that is shown in Exhibit Eighteen.

Q. All right, let's look at that.

A. Okay, the two types of wells are shown here, the commingled Mesaverde-Chacra and the dual Mesaverde-Chacra.

The after tax rate of return, the discounted profit, reserves that we expect, and the payout in years for each of these wells is presented.

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The -- I'd like to point out on here this discounted profit number is for the 100 percent working interest, so for instance, if the well was only 50 percent ownership by Tenneco or another company, that you'd have to divide these numbers in half, but these economics are run with a working interest owner of 100 percent.

Okay, using your different intial expenses to complete the wells, as I said, it's $22,000 more expensive to complete the dual, and then using also, you have a more expensive operating cost, because,if you have a dual well, because of the fact that you have two separators on surface.

We again ran through a simulated history of these wells, looking at production expenses, and calculated what our rates of return would be on these wells.

The commingled Mesaverde-Chacra well had a rate of return,after tax rate of return of 22.6 percent, which is a number that Tenneco feels is acceptable for an investment at this time.

The dual completion had an after tax rate of return of 14 percent, which is a number that Tenneco feels is an unacceptable rate of return on any project with borrowing money for a capital investment at interest rates of -- in excess of 18 percent. We do not feel that 14 percent rate of return is an acceptable return on our money,

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and we would not drill a well of this type.

Another thing that I think is significant on this exhibit is the fact that we feel the commingled well will produce an additional 30-million cubic feet of reserves because of the fact that when one zone gets weak and possibly starts producing liquids, it will -- between both zones coming up the tubing, the life of the well will just be longer. With the more efficient flow regime, we'll just be able to keep it on longer.

Q. All right, would you describe for us Exhibit Number Nineteen?

A. Okay. Exhibit Number Nineteen is our options, this time looking at the comparison of drilling -- well, our objective is to recover gas from all three zones.

One way in which we can do this is the way we have proposed, the first proposal here, which is dualing the Dakota with commingled Mesaverde-Chacra, for a cost of $461,000.

Should we want to recover the reserves from all the wells without -- without commingling those two zones, we would have several other alternatives that we could follow, and these are listed in Group Two there.

The first alternative, of course, would be to drill three single completions. Now this would cost $750,000. Both the Mesaverde and the Chacra under our econ-

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omic standards are uneconomic, so this is not what we -- this is not really a consideration for us.

A more feasible consideration, as far as costs are concerned, would be the next three options, and this is essentially, drill one dual well and one single completion, and I should also mention that these options would be considered far superior and of less cost than drilling a triple completion.

Q. But am I correct in understanding, under all the other alternatives, the total ultimate recovery from both the formations is going to be less than if they were commingled?

A. We believe that to be the case, yes.

The second alternative on here is to drill a dual Mesaverde-Dakota well, for a cost of $449,000, and drill a single Chacra well for $140,000, for a total cost of $589,000. This would be $128,000 more expensive than our initial alternative, but because of the fact that the Chacra well is economically unfeasible, we would not drill that well, and therefor, we would not recover the reserves in that zone.

The third alternative is to drill a dual Mesaverde-Chacra well and a single Dakota well, with the dual Mesaverde-Chacra at an estimated $242,000 and the single Dakota, $347,000, total cost would be $589,000, which again

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is -- which is $235,000 more expensive than our initial alternative.

But again in case three, we have a dual Mesaverde-Chacra well, which I have just showed on the previous page, only has a rate of return of 14 percent, which we consider unacceptable, so we would not drill a well of that type.

The fourth alternative is to drill one -- to drill a dual Dakota-Chacra well for $401,000, and then a single Mesaverde well for $263,000. That would give you a total cost of $664,000, which is $203,000 more than our initial -- than our proposed alternative, but again here we would have a single Mesaverde well, which is far from being anywhere near economically acceptable with what we believe the reserves to be, and we would not drill a well of that type, and therefor, we would not recover any reserve from the Mesaverde in that alternative.

Q. Were Exhibits One -- I'm sorry, Exhibits Eleven through Nineteen prepared by you or compiled under your direction?

A. Yes.

Q. And in your opinion, Mr. Boyle, will approval of this application be in the best interests of conservation, the prevention of waste, and the protection of correlative rights?

A. Yes.

MR. KELLAHIN: We move the introduction of Exhibits One through Nineteen.

MR. STAMETS: These exhibits will be admitted.

Any questions of this witness?

MR. PADILLA: I have.

CROSS EXAMINATION

BY MR. PADILLA:

Q. Mr. Doyle, on Exhibit Eighteen you were comparing the after tax rate of return. I believe you testified that the 14 percent rate of return would be unacceptable because of your interest costs.

If that is an after tax rate of return would you have already taken into account your interest costs?

A. I don't really understand the question. Now, if the -- the after tax -- I believe the answer to the question is no. We do not consider, you know, in our economic evaluations we do not consider the, you know, the 18 percent cost of that money. We do discount the money that we have to -- that we spend. All our economics are discounted to present value of 10 percent, but as far as the cost of borrowing the money, we -- we have a present value,

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I would say, of the money, but there is no value pre-tax, you know, there is no cost figured in for the -- for the cost of capital, no, that is not in the economic analysis as we run them.

I don't know if that really answered your question.

Q. Well, I don't know, it just seems to me thatin computing your tax you would be deducting the interest cost.

A. No, we are not.

Q. In arriving at a net --

A. No, in this particular computer simulation we do not.

Q. Then this really isn't an after tax rate of return, is it?

A. Okay, well, we -- when we go through this computer program, it takes a net lease operating income, or profit, from each year, and then it takes Federal income tax from that, and that is subtracted from our cash flow. That is how that after tax comes out. It's a reduction in our profitability because of Federal taxes. That's where our tax consideration comes in.

MR. HUBBARD: Okay. Mr. Kellahin, did [illegible] as to whether the nature of the ownership [illegible] the combined -- or proposed combined zone?

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MR. KELLAHIN: Yes, Ms. Peavey did. She indicated that if the Mesaverde is continued to be developed on 160 acres, and a Chacra 160-acre unit is dedicated, that the interest between the two zones is common.

The only time the interest is different is if the Mesaverde is developed on 320, and then we have a problem. We couldn't downhole commingle because of the difference in ownership.

MR. PADILLA: No further questions.

MR. STAMETS: The witness may be excused. Anything further in this case?

The case will be taken under advisement.

(Hearing concluded.)

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REPORTER'S CERTIFICATE

I, SALLY W. BOYD, C. S. R., DO HEREBY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division was reported by me; that the said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability.

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____.

_____, Examiner
Oil Conservation Division

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STATE OF NEW MEXICO

DEPARTMENT OF ENERGY AND MINERALS

OIL CONSERVATION DIVISION

MARCH 26, 1980

EXHIBITS

TENNECO OIL COMPANY
1980 BLOOMFIELD AREA DRILLING PROGRAM
WELL SUMMARY

CHACRA-MESA VERDE-DAKOTA WELLS

WELL	LOCATION
1. Marquis G. Eaton AlE	NE-25-29-11
2. Elvin J. Payne AlE	SW-19-29-10
3. Sullivan Frame Gas AlE	NE-30-29-10
4. Sullivan Gas AlE	SW-25-29-11
5. Valdez Gas AlE	NE-24-29-11

CHACRA-MESA VERDE WELLS

WELL	LOCATION
1. Bunce Com 1	NW-29-29-10
2. Eaton Com B-1	SW-25-29-11
3. Bruce Sullivan Com B-1	NW-25-29-11
4. Sullivan Frame Com B-1	NW-30-29-10
5. Valdez Com B-1	SE-24-29-11

PAD 3/21/80

TYPE LOG

CHACRA FM.

GETTY OIL COMPANY
HANLEY B#1

SW/4 SEC. 18, T29N-R10W

SAN JUAN COUNTY, NEW MEXICO

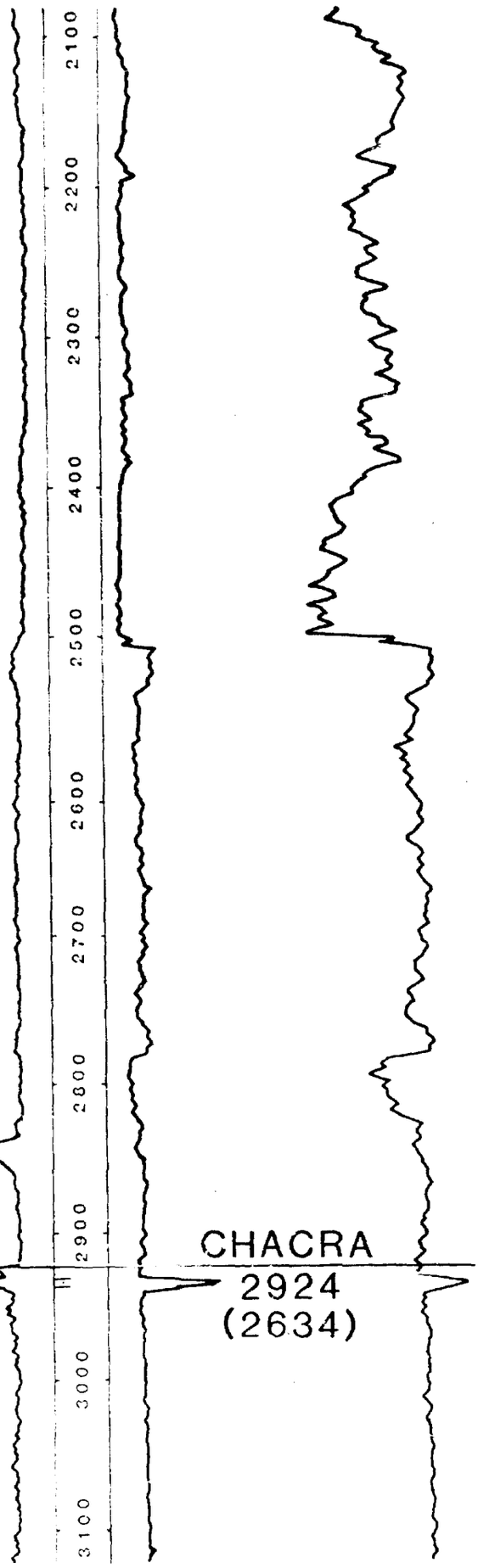
IPF: 791 MCFD
48/64 CK

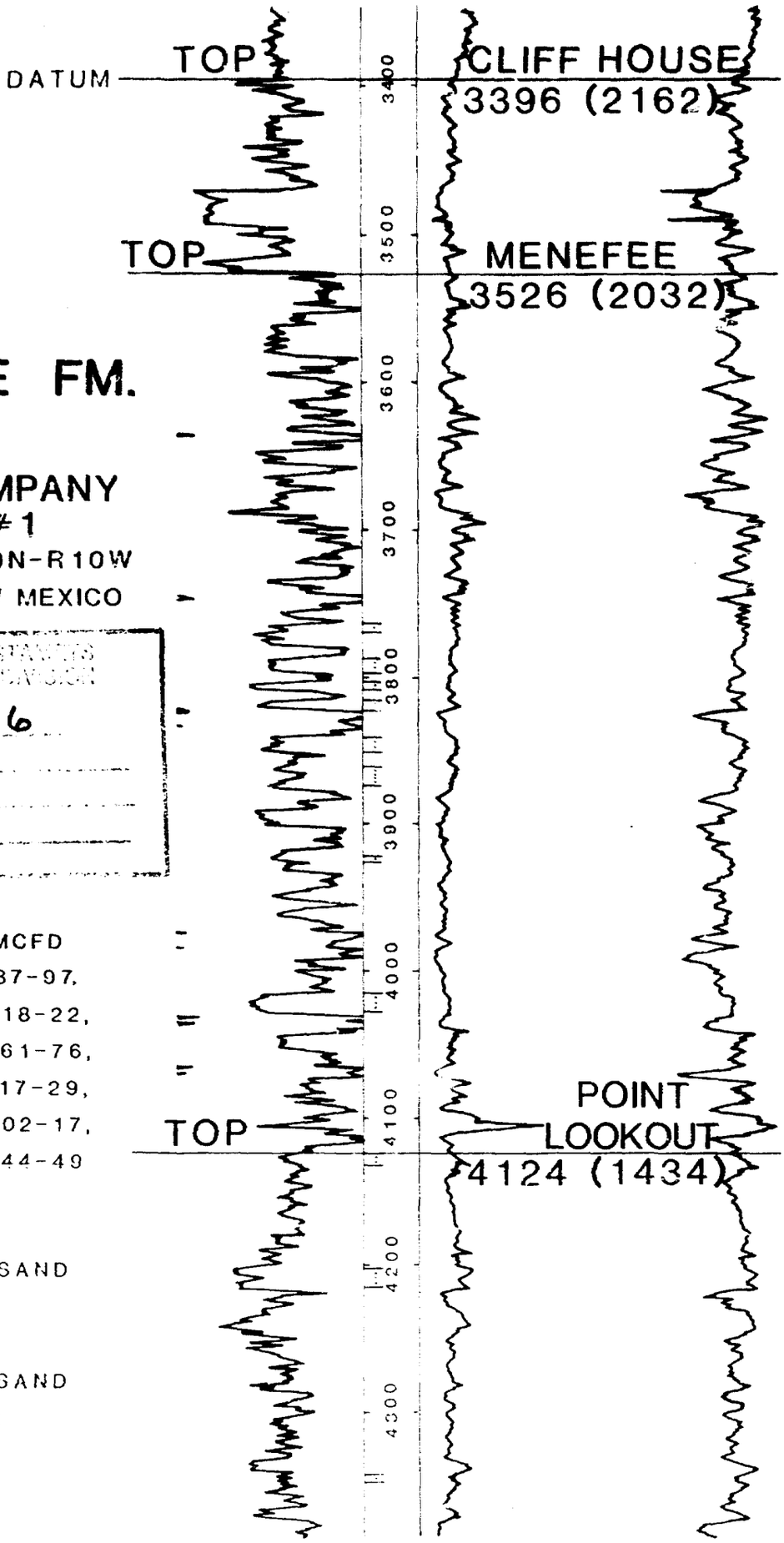
PERF: 2932-38

SWFR 21,000 GALS.
30,000 LBS. SAND

TP 46, CP 290, GTY 60

5 1CP
1012





TYPE LOG

MESAVERDE FM.

GETTY OIL COMPANY
HANLEY B#1

SW/4 SEC. 18, T29N-R10W

SAN JUAN CO., NEW MEXICO

BEFORE EXAMINER STAMETS
OIL CONSERVATION DIVISION
EXHIBIT NO. 6
CASE NO. 6847

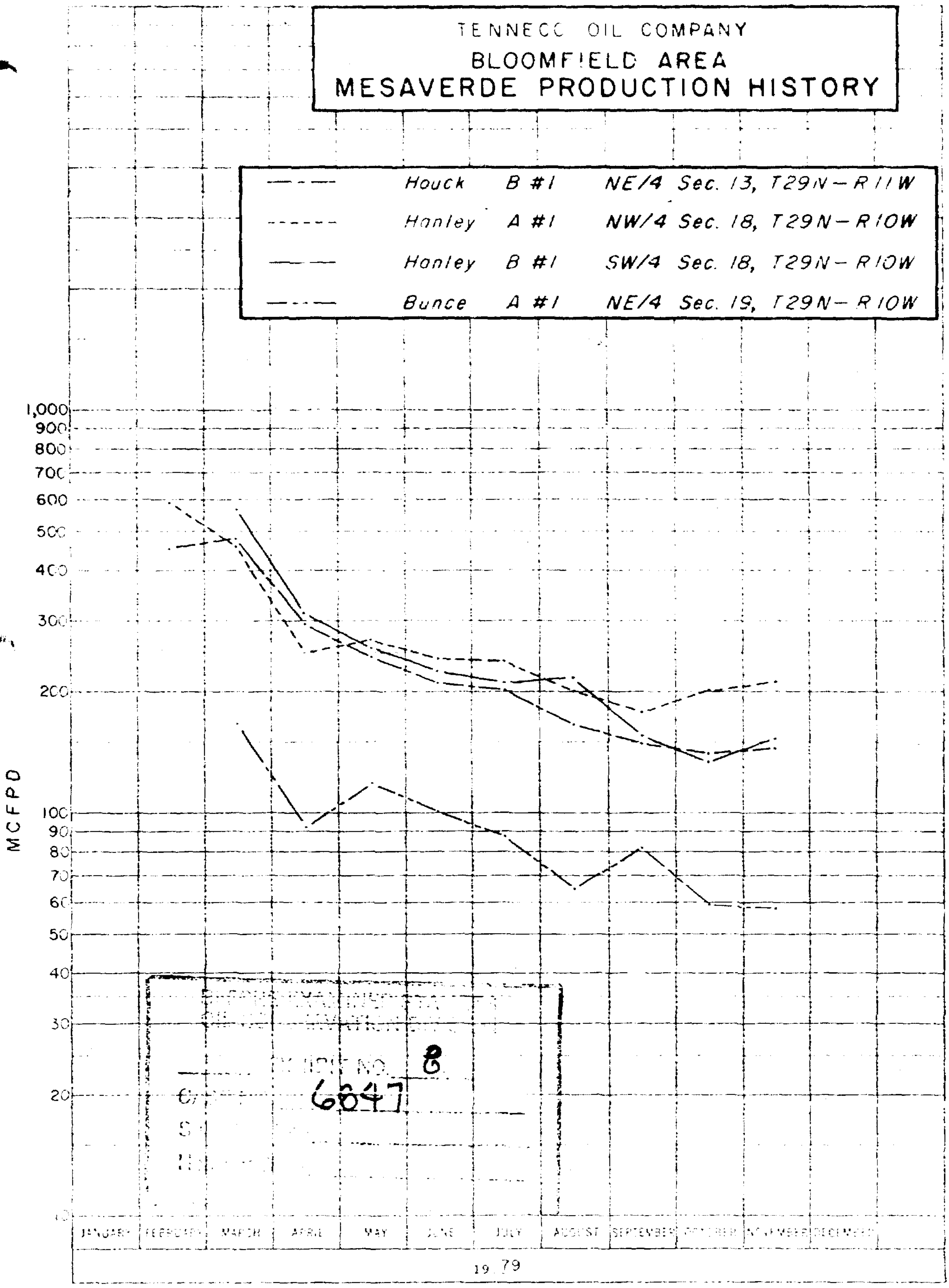
IPF: 2 BCPD 2117 MCFD

PERF: 3764-69, 3787-97,
3804-10, 3818-22,
3842-52, 3861-76,
3924-28, 4017-29,
4126-32, 4202-17,
4243-44, 4344-49

SWFR 3764 3876
73,000 GALS.
75,000 LBS. SAND

SWFR 3924-4349
48,310 GALS.
55,000 LBS. SAND

TP 148 CPO, GTY 60


TENNECO OIL COMPANY
BLOOMFIELD AREA
MESAVERDE PRODUCTION HISTORY
Houck B #1 NE/4 Sec. 13, T29N-R11W
Hanley A #1 NW/4 Sec. 18, T29N-R10W
Hanley B #1 SW/4 Sec. 18, T29N-R10W
Bunce A #1 NE/4 Sec. 19, T29N-R10W
MCFPD
1,000
900
800
700
600
500
400
300
200
100
90
80
70
60
50
40
30
20
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
19 79
EXHIBIT NO. 8
6847

EL PASO NATURAL GAS COMPANY

RPT-ASL 396 CHROMATOGRAPHIC ANALYSIS

Getty Ch.

RPT DATE 05 18 79
ANAL DATE 05 17 79

TYPE CODE	SAMPLE DATE	RPT. DATE		SCALE		
00	05 15 79	05 18 79		1		

	MOLE %	GPM
C O 2	00.21	0.020
H 2 S	00.00*	0.000
N2	00.27	0.033
METHANE	88.37	0.000
ETHANE	07.15	1.905
PROPANE	02.61	0.735
ISO-BUTANE	00.47	0.156
NORM-BUTANE	00.82	0.258
ISO-PENTANE	00.23	0.084
NORM-PENTANE	00.15	0.065
HEXANE PLUS	00.41	0.177
TOTALS	100.00	3.534

SPECIFIC GRAVITY 0.684

MIXTURE HEATING VALUE
(BTU/CF @ 14.73 PSIA&60 DEGREES F) 1171

RATIO OF SPECIFIC HEATS 1.19
* NO TEST SECURED FOR DETERMINATION WAS SUPPLIED.

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6847

Getty M.V.

C O 2	[illegible]	[illegible]
H 2 S	[illegible]	[illegible]
N2	[illegible]	[illegible]
METHANE	[illegible]	[illegible]
ETHANE	[illegible]	[illegible]
PROPANE	[illegible]	[illegible]
ISO-BUTANE	[illegible]	[illegible]
NORM-BUTANE	01.23	0.305
ISO-PENTANE	[illegible]	[illegible]
NORM-PENTANE	[illegible]	[illegible]
HEXANE PLUS	[illegible]	[illegible]
TOTALS	100.00	5.708

SPECIFIC GRAVITY [illegible]

MIXTURE HEATING VALUE
(BTU/CF @ [illegible] PSIA AND DEGREES F) 1.74

RATIO OF SPECIFIC HEATS [illegible]
* NO TEST SECURED FOR DETERMINATION [illegible]

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6847

TENNECO OIL COMPANY
1980 BLOOMFIELD AREA DRILLING PROGRAM
DRILLING AND COMPLETION PROCEDURE
COMMINGLED MESA VERDE-CHACRA WELLS

DRILLING

1. Drill 12-1/4" hole to 250'.
2. Set 9-5/8" casing and cement to surface.
3. Drill 8-3/4" hole thru Chacra to ≈ 3100'.
4. Set 7" csg and cement to surface.
5. Drill 6-1/4" hole thru Mesa Verde to ≈ 4500'.
6. Run open hole logs over Mesa Verde and cased hole logs over Chacra.
7. Set 4-1/2" liner from 4500' to 2900'.
8. Cement liner in place.

COMPLETION

1. Drill out to plug back total depth.
2. Perforate Mesa Verde (≈ 50') with 2 shots per foot.
3. Acidize Mesa Verde with 1000 gals 15% HCL and ball sealers.
4. Frac Mesa Verde with 175,000# 20/40 sand in 1% KCl water.
5. Set retrievable bridge plug between Chacra and Mesa Verde.
6. Perforate Chacra (≈ 10') with 2 shots per foot.
7. Acidize Chacra with 500 gals 15% HCL and ball sealers.
8. Frac Chacra with 30,000# 10/20 sand in 70% quality foam.
9. Retrieve bridge plug.
10. Land tubing above Mesa Verde perforations.
11. Flow well to cleanup frac fluid.
12. Shut-in well for AOF test.

PAD 3/21/80

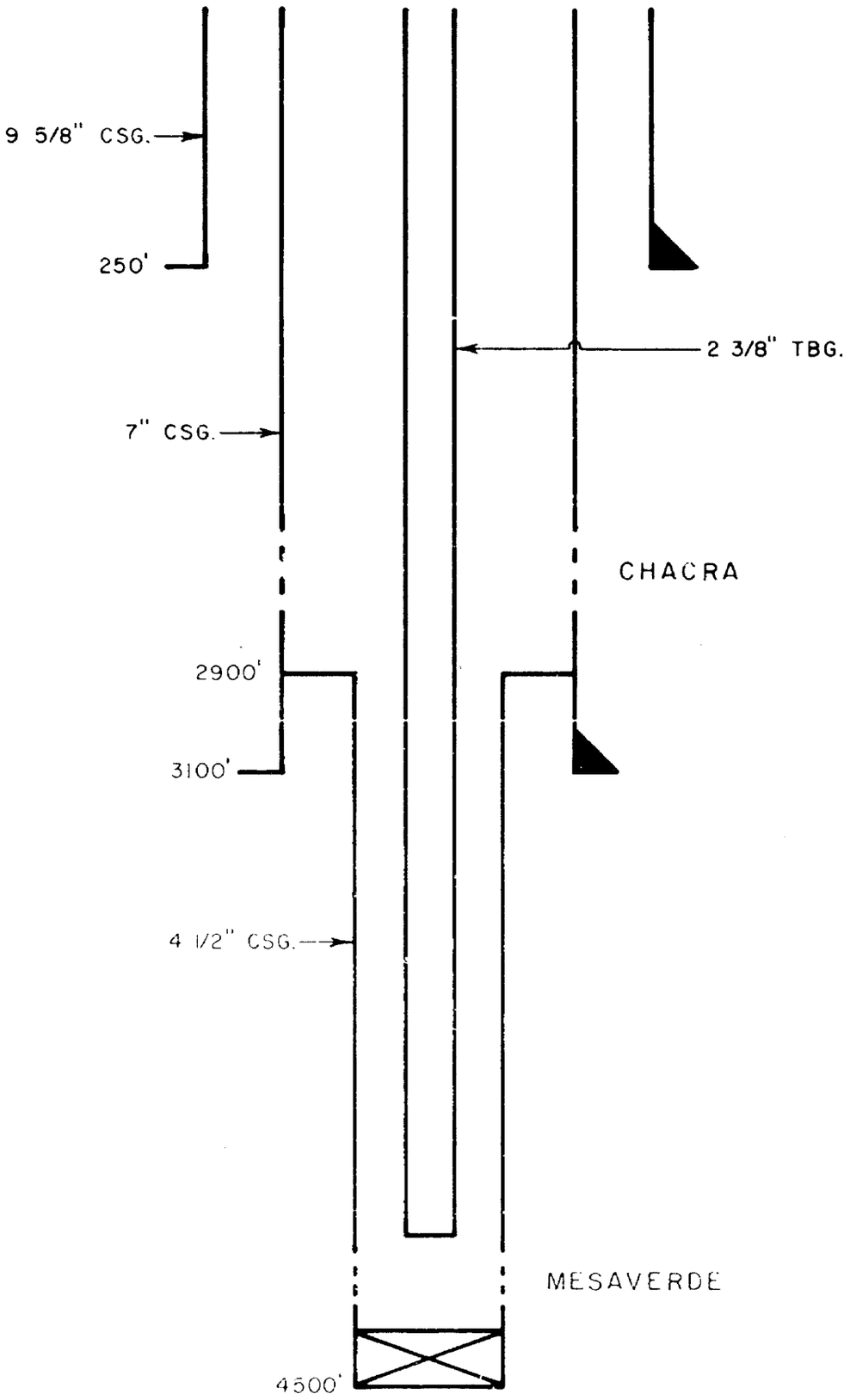
TENNECO OIL COMPANY

BLOOMFIELD AREA

T 29 N - R 10 & 11 W

SAN JUAN COUNTY, NEW MEXICO

MESAVERDE - CHACRA COMINGLED WELLBORE SCHEMATIC



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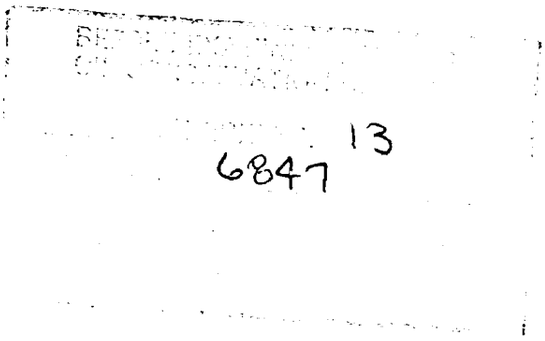
'TENNECO OIL COMPANY
1980 BLOOMFIELD AREA DRILLING PROGRAM
DRILLING AND COMPLETION PROCEDURE
DAKOTA DUALED WITH COMMINGLED CHACRA-MESA VERDE

DRILLING

1. Drill 12-1/4" hole to 250'.
2. Set 9-5/8" csg and cement to surface.
3. Drill 8-3/4" hole thru Mesa Verde to ≈ 4500'.
4. Set 7" csg and cement to surface using 2 stage cement job with DV tool at 2950'
5. Drill 6-1/4" hole thru Dakota to ≈ 6400'.
6. Run open hole logs over Dakota and cased hole log in 4-1/2" casing.
7. Set 4-1/2" liner from 6400' to 4300'.
8. Cement liner in place.

COMPLETION

1. Drill out to plug back total depth.
2. Perforate Dakota (≈ 50') with 2 shots per foot.
3. Acidize Dakota with 1500 gals 15% HCL and ball sealers.
4. Frac Dakota with 105,000# sand in 30# cross-linked gelled water.
5. Set Model "F" packer with expendable plug above Dakota.
6. Perforate Mesa Verde (≈ 50') with 2 shots per foot.
7. Acidize Mesa Verde with 1000 gals 15% HCL and ball sealers.
8. Frac Mesa Verde with 175,000# 20/40 sand in 1% KCl water.
9. Set retrievable bridge plug between Chacra and Mesa Verde.
10. Perforate Chacra (≈ 10') with 2 shots per foot.
11. Acidize Chacra with 500 gal 15% HCL and ball sealers.
12. Frac Chacra with 30,000# 10/20 sand in 70% quality foam.
13. Retrieve bridge plug.
14. Run in hole and land Dakota tubing string in Model "F" packer.
15. Run in hole and land Mesa Verde-Chacra tubing string above Mesa Verde.
16. Flow well to cleanup frac fluid.
17. Shut-in well for AOF test.



PAD 3/21/80

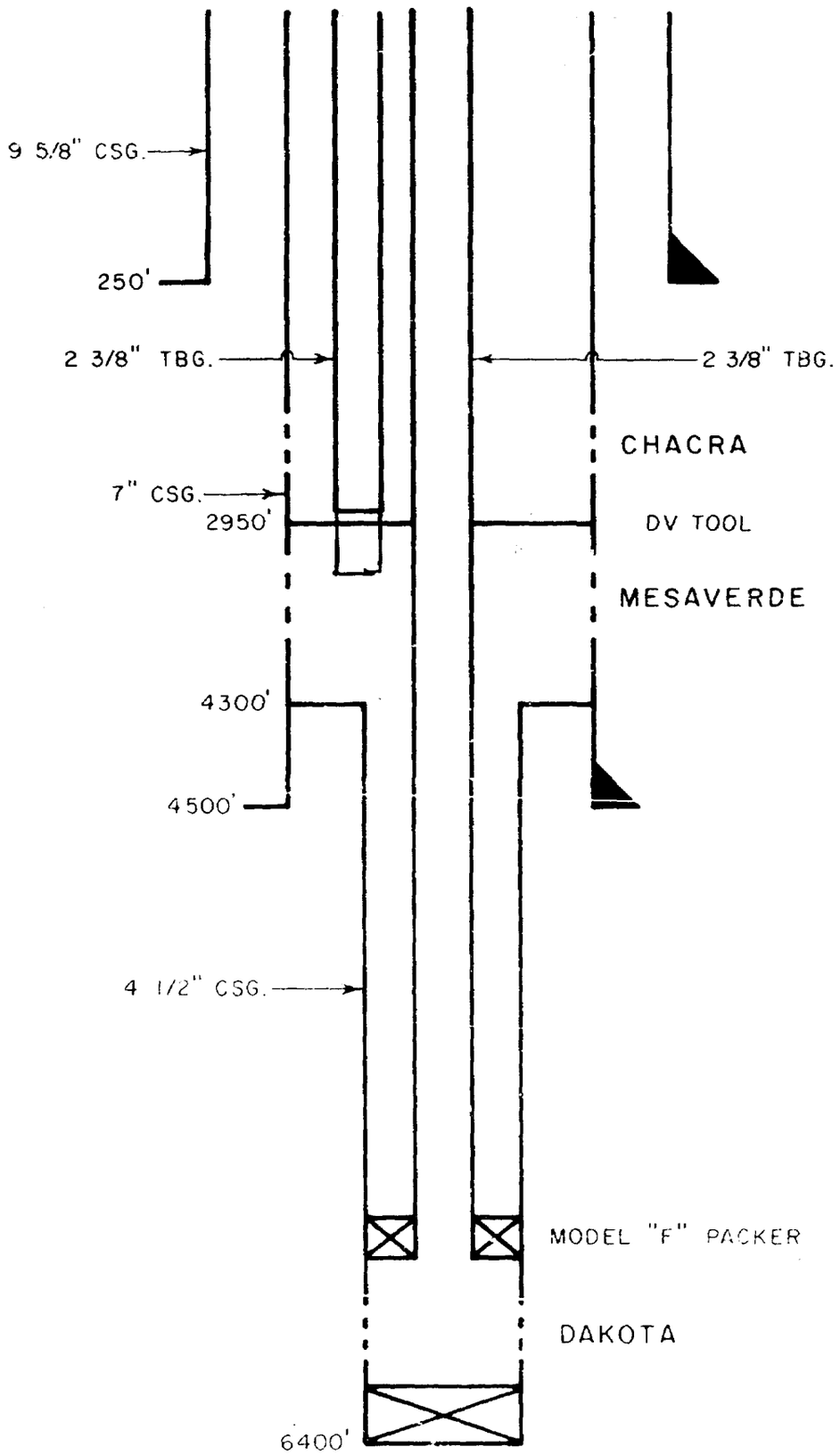
TENNECO OIL COMPANY

BLOOMFIELD AREA

T 29 N - R 10 & 11 W

SAN JUAN COUNTY, NEW MEXICO

DAKOTA DUAL WITH MESAVERDE - CHACRA COMINGLED WELLBORE SCHEMATIC



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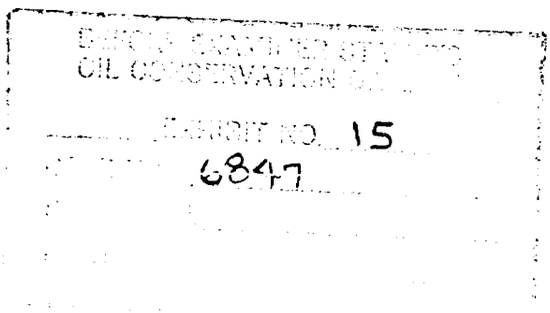
TENNECO OIL COMPANY
1980 BLOOMFIELD AREA DRILLING PROGRAM
ESTIMATED GROSS RESERVES

ZONE	RESERVES (MMCF)
Chacra	170
Mesa Verde	160
Dakota	1350



TENNECO OIL COMPANY
1980 BLOOMFIELD AREA DRILLING PROGRAM
ALTERNATIVE COST SUMMARY

TYPE WELL	TOTAL COST ($M)
Single Completion	
Mesa Verde	263
Dakota	347
Chacra	140
	750
Duals Without Commingling	
Dakota-Mesa Verde	449
Mesa Verde-Chacra	349
Dakota-Chacra	401
Commingled Charca-Mesa Verde	
Mesa Verde-Chacra	327
Three Zones With Two Commingled	
Dakota Dualed with Chacra & Mesa Verde Commingled	461

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TENNECO OIL COMPANY
1980 BLOOMFIELD AREA DRILLING PROGRAM
WELLS WITH MESA VERDE AND CHACRA POTENTIAL
COST COMPARISON

I. Proposed Completion-Commingle Zones

Cost: $327,000

II. Alternative Without Commingling

Alternative	Cost	Cost Over Commingled Alternative ($M)
1. Dually Complete Chacra & Mesa Verde	349	22

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6847

PAD 3/21/80

TENNECO OIL COMPANY
1980 BLOOMFIELD AREA DRILLING PROGRAM
ECONOMIC SUMMARY
MESA VERDE-CHACRA WELL

TYPE WELL	AFTER TAX RATE OF RETURN (%)	DISCOUNTED PROFIT @10% (M$)	RESERVES (MMCF)	PAYOUT (YEARS)
COMMINGLED Mesa Verde-Chacra	22.6	80.9	360	3.2
DUAL Mesa Verde-Chacra	14.0	28.6	330	3.9

TENNECO OIL COMPANY
1980 BLOOMFIELD AREA DRILLING PROGRAM
WELLS WITH CHACRA, MESA VERDE, AND DAKOTA POTENTIAL
COST COMPARISON

I. Proposed Completion-Dakota Dual With Mesa Verde & Charca Commingled

Cost: $461,000

II. Alternatives Without Commingling

Alternative	Cost	Cost Over Commingled Alternative ($M)
1. Drill 3 Single Completions	750	289
2. Drill 1 Dual MV-Dakota	449	-
Drill 1 Single Chacra	140	-
Total 2 Wells	589	128
3. Drill 1 Dual MV-Chacra	349	-
Drill 1 Single Dakota	347	-
Total 2 Wells	696	235
4. Drill 1 Dual Dakota-Chacra	401	-
Drill 1 Single Mesa Verde	263	-
Total 2 Wells	664	203

PAD 3/21/80

Dockets Nos. 9-80 and 10-80 are tentatively set for April 9 and 23, 1980. Applications for hearing must be filed at least 22 days in advance of hearing date.

DOCKET: EXAMINER HEARING - WEDNESDAY - MARCH 26, 1980

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

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

CASE 6838: Application of Amax Chemical Corporation for the amendment of Order No. R-111-A, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the amendment of Order No. R-111-A to extend the boundaries of the Potash-Oil Area by the inclusion of certain lands in Sections 11, 12, and 13, Township 19 South, Range 30 East, and Sections 7 and 18, Township 19 South, Range 31 East.

CASE 6839: Application of Kimbell Oil Company for downhole commingling, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of Otero-Chacra and South Blanco-Pictured Cliffs production in the wellbore of its Salazar Well No. 4-26 to be located in Unit D of Section 26, Township 25 North, Range 6 West.

CASE 6840: Application of Union Texas Petroleum for downhole commingling, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks approval for the downhole commingling of Fruitland and Pictured Cliffs production in the wellbore of its Johnston Federal Well No. 11Y located in Unit N of Section 7, Township 31 North, Range 9 West.

CASE 6841: Application of CIG Exploration, Inc. for two non-standard gas proration units, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of two non-standard gas proration units in Township 16 South, Range 28 East, the first being 219.6 acres comprising Lots 1 thru 8 of Section 1 and the second being 219.92 acres comprising Lots 1 thru 8 of Section 2, for the Wolfcamp, Pennsylvanian, and Mississippian formations, each unit to be dedicated to a well to be drilled at a standard location thereon.

CASE 6842: Application of ARCO Oil and Gas Company for an unorthodox gas well location, simultaneous dedication, and approval of infill drilling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of its W. C. Roach Well No. 6, 660 feet from the North line and 1980 feet from the West line of Section 21, Township 20 South, Range 37 East, Eumont Gas Pool, to be simultaneously dedicated with its W. C. Roach Well No. 1 in Unit D to the W/2 of said Section 21. Also sought are findings that the proposed well is necessary to effectively and efficiently drain that portion of the proration unit which cannot be so drained by the existing unit well.

CASE 6843: Application of Yates Petroleum Corporation for two compulsory poolings, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Yeso formation underlying two 40-acre proration units, the first being the SE/4 SE/4 and the second being the SW/4 SE/4 of Section 6, Township 19 South, Range 25 East, Penasco Draw Field, each unit to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said wells and the allocation of the cost thereof as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the wells and a charge for risk involved in drilling said wells.

CASE 6844: Application of Arrowhead Oil Corporation for two exceptions to Order No. R-111-A and an unorthodox well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an exception to the casing-cementing rules of Order No. R-111-A to complete its Creek Federal Well No. 3 at an unorthodox location 250 feet from the North line and 2350 feet from the East line and its Creek Federal Well No. 4 to be drilled in Unit G, both in Section 23, Township 18 South, Range 30 East, by setting surface casing at a depth of approximately 600 feet and production casing at total depth. The production casing would have cement circulated back to the potash zone in the salt section.

CASE 6845: Application of Marathon Oil Company for an unorthodox gas well location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval for the unorthodox location of a well to be drilled 800 feet from the North line and 200 feet from the East line of Section 30, Township 21 South, Range 23 East, Indian Basin-Upper Pennsylvanian Gas Pool, all of Section 30 or that portion thereof which may be reasonably presumed productive of gas from said pool to be dedicated to the well.

CASE 6846: Application of Doyle Hartman for two compulsory poolings, two non-standard gas proration units, and two unorthodox well locations, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Eumont Gas Pool underlying two 80-acre non-standard gas proration units, the first being the S/2 NE/4 of Section 13, Township 21 South, Range 36 East, to be dedicated to a well to be drilled at an unorthodox location 1650 feet from the North line and 2310 feet from the East line of said Section 13, and the second being the N/2 NE/4 of said Section 13 to be dedicated to a well to be drilled at an unorthodox location 1330 feet from the North line and 2310 feet from the East line of said Section 13. Also to be considered will be the cost of drilling and completing said wells and the allocation of the cost thereof as well as actual operating costs and charges for supervision. Also to be considered will be the designtion of applicant as operator of the wells and a charge for risk involved in drilling said wells.

CASE 6834: (Continued and Readvertised)

Application of Conoco Inc. for a dual completion and unorthodox well location, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval for the dual completion (conventional) of its SEMU Burger Well No. 107 at an unorthodox location 2615 feet from the South and East lines of Section 19, Township 20 South, Range 38 East, to produce oil from the Blinebry Oil and Gas and Drinkard Pools.

CASE 6837: (Continued from March 12, 1980, Examiner Hearing)

Application of Curtis Little for compulsory pooling, Rio Arriba County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Dakota formation underlying the W/2 of Section 7, Township 25 North, Range 3 West, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in drilling said well.

CASE 6847: Application of Tenneco Oil Company for dual completions and downhole commingling, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks authority to dually complete, in such a manner as to produce gas from the Dakota formation and commingled Chacra and Mesaverde production through parallel strings of tubing, ten proposed wells to be located as follows: in Township 29 North, Range 10 West: Unit C, Section 19; Unit N, Section 19; Unit A, Section 30; and Unit D, Section 30; in Township 29 North, Range 11 West: Unit G, Section 24; Unit O, Section 24; Unit A, Section 25; Unit D, Section 25; Unit M, Section 25; and Unit P, Section 25.

CASE 6818: (Continued from March 12, 1980, Examiner Hearing)

Application of Tenneco Oil Company for an NGPA determination, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks a new onshore reservoir determination for its State HL 11 Well No. 1 located in Unit N of Section 11, Township 19 South, Range 29 East.

CASE 6849: (This is the same matter as was previously designated Case No. 6813.)

Application of Petroleum Development Corporation to amend Order No. R-6196, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks to amend Order No. R-6196 which authorized re-entry of a well at an unorthodox location in the Lusk-Morrow Gas Pool to be dedicated to the N/2 of Section 13, Township 19 South, Range 31 East. Applicant now seeks approval for a new revised location 750 feet from the North line and 660 feet from the West line of said Section 13.

CASE 6848: Application of Petroleum Development Corporation for pool contraction and creation, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the contraction of the Querecho Plains-Bone Spring Pool to comprise the Upper Bone Spring formation only, from 8390 feet to 8680 feet on the log of its McKay West Federal Well No. 1 located in Unit F of Section 34, Township 18 South, Range 32 East, and the creation of the Querecho Plains-Lower Bone Spring Pool to comprise said formation from 8680 feet to the base of the Bone Spring underlying the NW/4 of said Section 34.

CASE 6826: (Continued from March 12, 1980, Examiner Hearing)

Application of Tahoe Oil and Cattle Company for compulsory pooling, Lea County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Penrose Skelly Pool underlying the SE/4 SE/4 of Section 25, Township 21 South, Range 36 East, to be dedicated to its Bromlee Well No. 1 located thereon. Also to be considered will be the cost of recompleting said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision. Also to be considered will be the designation of applicant as operator of the well and a charge for risk involved in recompleting said well.

KELLAHIN and KELLAHIN
Attorneys at Law
500 Don Gaspar Avenue
Post Office Box 1769
Santa Fe, New Mexico 87501

Jason Kellahin
W. Thomas Kellahin
Karen Aubrey

Telephone 982-4285
Area Code 505

March 3, 1980

Mr. Joe Ramey
Oil Conservation Division
P. O. Box 2088
Santa Fe, New Mexico

re: Tenneco Oil Company
Application for Dual Completion
and Downhole Commingling,
San Juan County, New Mexico

Case 6847

Dear Joe:

Please set the enclosed application for hearing on March 26, 1980.

Very truly yours,

W. Thomas Kellahin

encl.
cc: Mr. Millard Carr (Tenneco - Denver)
WTK:msf

STATE OF NEW MEXICO

DEPARTMENT OF ENERGY AND MINERALS

OIL CONSERVATION DIVISION

IN THE MATTER OF THE APPLICATION
OF TENNECO OIL COMPANY FOR DUAL
COMPLETION AND DOWNHOLE COMMINGLING,
SAN JUAN COUNTY, NEW MEXICO.

Case 6847

APPLICATION

COMES NOW TENNECO OIL COMPANY, by and through its attorneys, KELLAHIN & KELLAHIN, and applies to the New Mexico Oil Conservation Division for approval to drill ten wells in which the Chacra and Mesa Verde production will be commingled and then produced as a dual completion with the Dakota formation, all in San Juan County, New Mexico, and in support thereof would show:

1. Applicant is the operator of each of the units and formations involved in this application as shown on the attached surface plat.

2. Applicant requests approval to commingle production from the Chacra and Mesaverde formations and to dually complete those commingled zones with the Dakota formation for the following wells:

1. Bunce Com Well No. 1, Unit C, Sec. 19, 729N, R10W, NMPM; ✓
2. Elvin J. Paynes Gas Unit "A" Well No. 1-E, Unit N, Sec. 19, T29N, R10W, NMPM; ✓
3. Sullivan Frame Gas Unit "A" Well No. 1-E, Unit A, Sec. 30, T29N, R10W, NMPM; ✓
4. Sullivan Frame Com "B" Well No. 1, Unit D, Sec. 30, T29N, R10W, NMPM; ✓
5. Valdez Gas Unit "A" Well No. 1-E, Unit G, Sec. 24, T29N, R11W, NMPM; X
6. Marquis G. Eaton Gas Unit "A" Well No. 1-E, Unit A, Sec. 25, T29N, R11W, NMPM; X
7. Valdez Com B-1 Well No. 1, Unit O, Sec. 24, T29N, R11W, NMPM; X

8. Bruce Sullivan Com B Well No. 1, Unit D, Sec. 25, T29N, R11W, NMPM;

9. Sullivan Gas Unit "A" Well No. 1-E, Unit M, Sec 25, T29N, R11W, NMPM;

10. Eaton Com "B" Well No. 1, Unit P, Sec. 25, T29N, R11W, NMPM.

Attached hereto and incorporated by reference are Division Forms C-102 for each well.

3. Applicant proposes to dedicate a 320-acre Dakota unit to each well and a 160-acre Chacra-Mesaverde unit to each well as shown on the Form C-102 attached hereto and incorporated by reference.

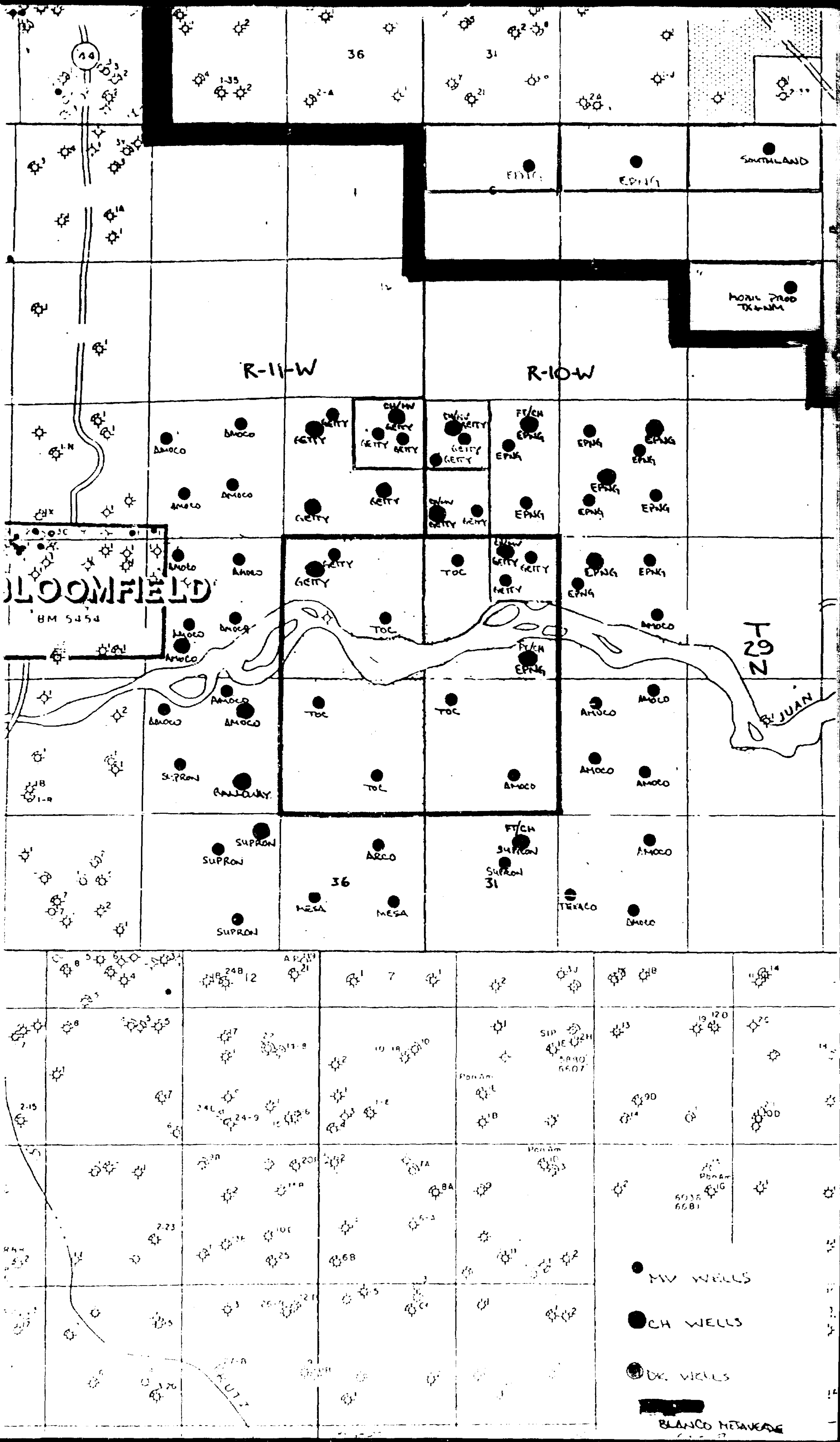
4. Applicant proposes to complete each well as shown on the wellbore schematic attached hereto and incorporated by reference.

5. That approval of the application will be in the best interest of conservation, the prevention of waste and the protection of correlative rights.

WHEREFORE, Applicant requests that this matter be set for hearing and that after notice and hearing, the Division approve the application as requested.

TENNECO OIL COMPANY

By _____
W. Thomas Kellahin
KELLAHIN & KELLAHIN
P. O. Box 1769
Santa Fe, New Mexico 87501
ATTORNEYS FOR APPLICANT



36
31
SOUTHLAND
EPNG
MOBIL PROD TX-NM
R-11-W
R-10-W
GETTY
AMOCO
EPNG
TOC
BLOOMFIELD
BM 5454
T 29 N
JUAN
SUPRON
ARCO
MESA
TEXACO
12
7
MV WELLS
CH WELLS
DK WELLS
BLANCO MESAVERDE

OIL CONSERVATION DIVISION

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-102
Revised 10-1-78

All distances must be from the outer boundaries of the Section

Operator	Lease	Well No.
TENNECO OIL COMPANY	BUNCE COM	1

Unit Letter	Section	Township	Range	County
C	19	29N	10W	San Juan

Actual Footage Location of Well:
990 feet from the North line and 1650 feet from the West line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
5521			Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

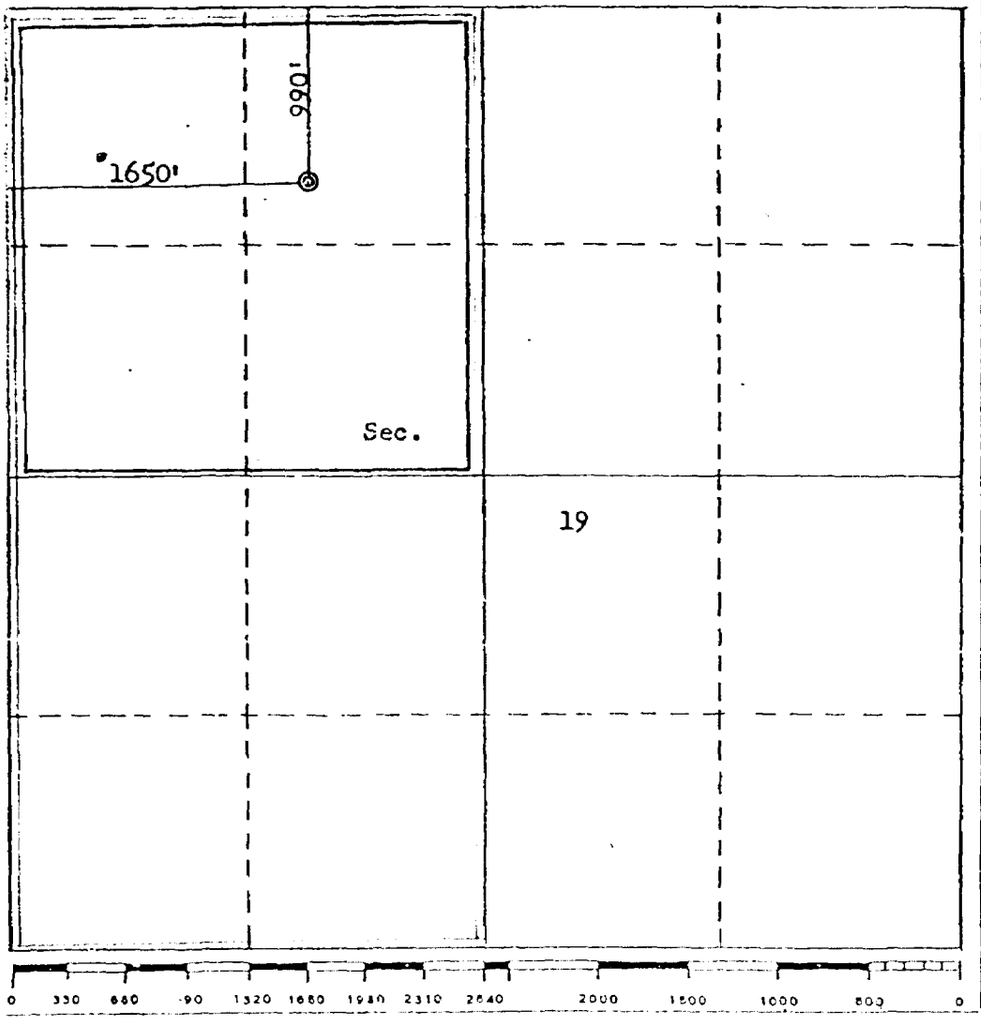
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

3. If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling. etc?

☐ Yes ☐ No If answer is "yes," type of consolidation _____

If answer is "no," list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.) _____

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interests, has been approved by the Commission.



CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Name

Position

Company

Date

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed
November 26, 1979

Registered Professional Engineer and/or Land Surveyor

Fred B. Kerr Jr.

Certificate No. 3950

FRED B. KERR, JR. — NEW MEXICO — 3950 — REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-102
Revised 10-1-78

All distances must be from the outer boundaries of the Section

Operator	Lease	Well No.
TENNECO OIL COMPANY	ELVIN J. PAYNE GAS UNIT "A"	1-E

Unit Letter	Section	Township	Range	County
N	19	29N	10W	San Juan

Actual Footage Location of Well:
530 feet from the South line and 2080 feet from the West line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
5476			Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

3. If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling. etc?

☐ Yes ☐ No If answer is "yes," type of consolidation _____

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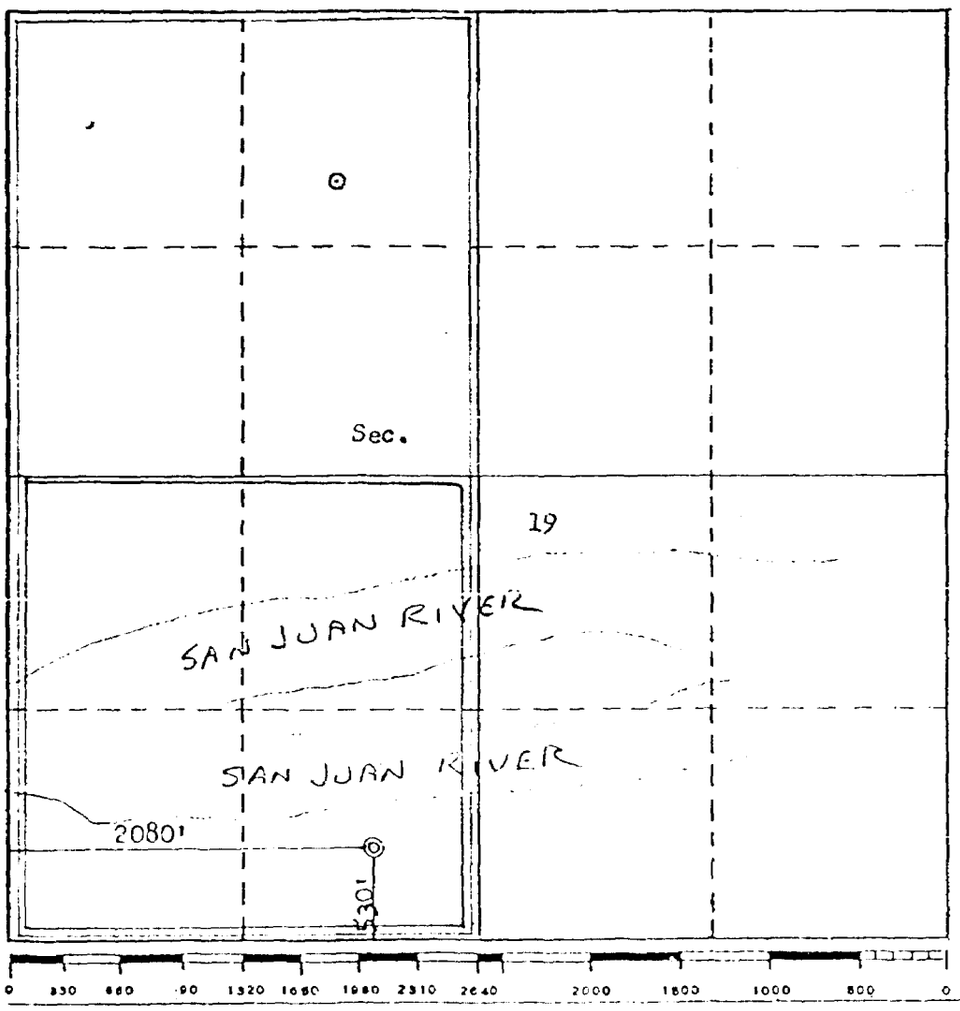

CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Name

Position

Company

Date

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed
September 7, 1979

Registered Professional Engineer and/or Land Surveyor
Fred B. Kerr Jr.

Certificate No.
3950

REGISTERED LAND SURVEYOR
NEW MEXICO
JOHN W. WEST
FRED B. KERR JR.

OIL CONSERVATION DIVISION

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-102
Revised 10-1-78

All distances must be from the outer boundaries of the Section

Operator	Lease	Well No.
TENNECO OIL COMPANY	SULLIVAN FRAME GAS UNIT "A"	1-E

Unit Letter	Section	Township	Range	County
A	30	29N	10W	San Juan

Actual Footage Location of Well:
990 feet from the North line and 790 feet from the East line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
5502	Dakota	Basin Dakota	Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

3. If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling. etc?

☐ Yes ☐ No If answer is "yes," type of consolidation _____

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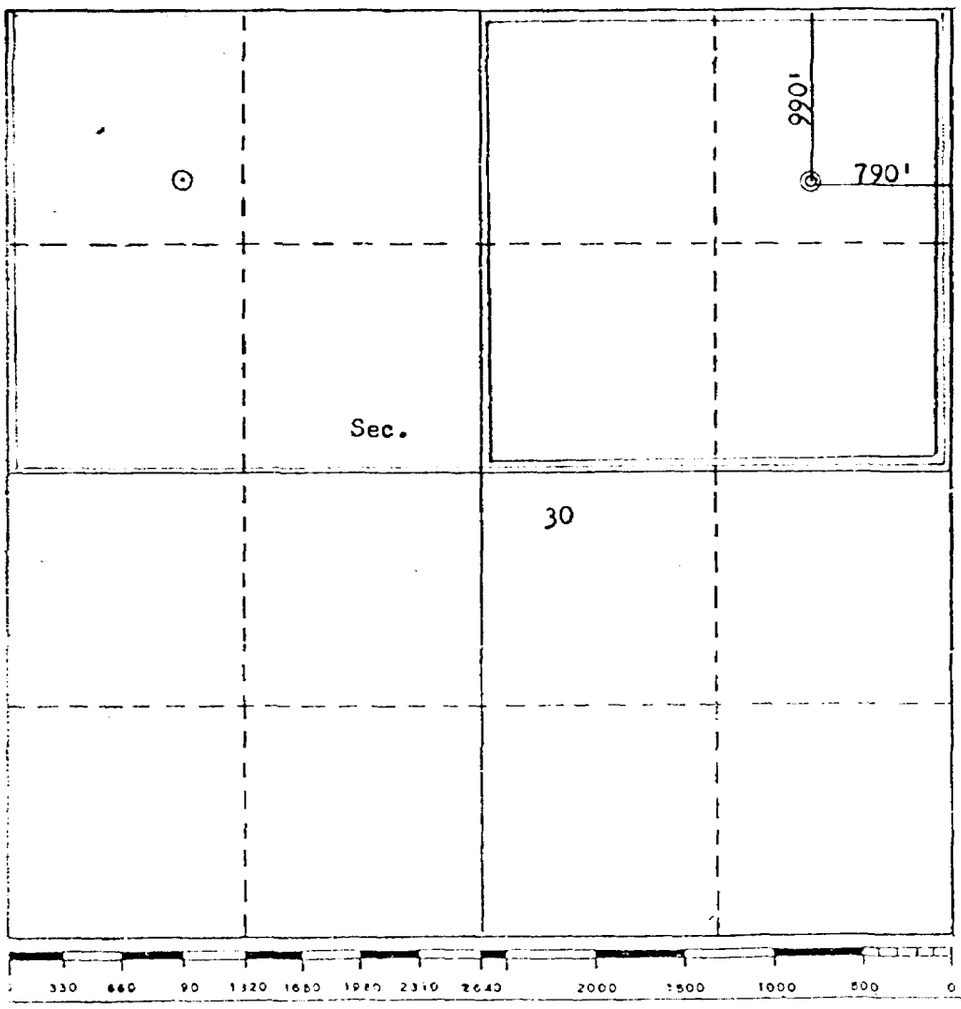


CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Name

Position

Company

Date

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed
September 3, 1979

Registered Professional Engineer and/or Land Surveyor
Fred B. Kerr Jr.

Certificate No. 3950

OIL CONSERVATION DIVISION

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-102
Revised 10-1-78

All distances must be from the outer boundaries of the Section.

Operator	Lease	Well No.
TENNECO OIL COMPANY	SULLIVAN FRAME COM "B"	1

Unit Letter	Section	Township	Range	County
D	30	29N	10W	San Juan

Actual Footage Location of Well:
1100 feet from the North line and 800 feet from the West line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
5466			Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

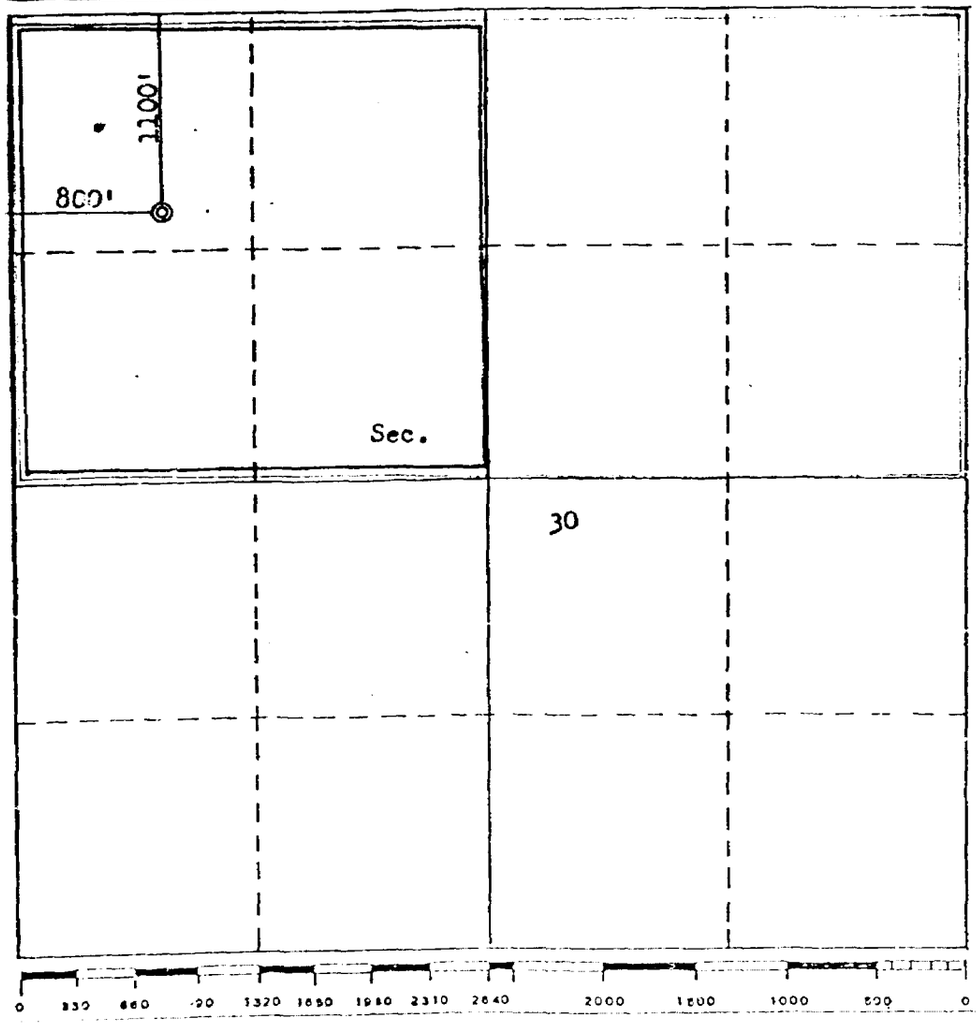
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

3. If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling. etc?

☐ Yes ☐ No If answer is "yes," type of consolidation _____

If answer is "no," list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.) _____

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interests, has been approved by the Commission.



CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Name

Position

Company

Date

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed
November 27, 1979

Registered Professional Engineer and/or Land Surveyor

Fred B. Kerr Jr.

Certificate No.
3950

REGISTERED LAND SURVEYOR
FRED B. KERR, JR.
NO. 3950

OIL CONSERVATION DIVISION

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-102
Revised 10-1-78

All distances must be from the outer boundaries of the Section

Operator	Lease	Well No.
TENNECO OIL COMPANY	VALDEZ GAS UNIT "A"	1-E

Unit Letter	Section	Township	Range	County
G	24	29N	11W	San Juan

Actual Footage Location of Well:
1650 feet from the North line and 1650 feet from the East line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
5486	Dakota	Basin Dakota	Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

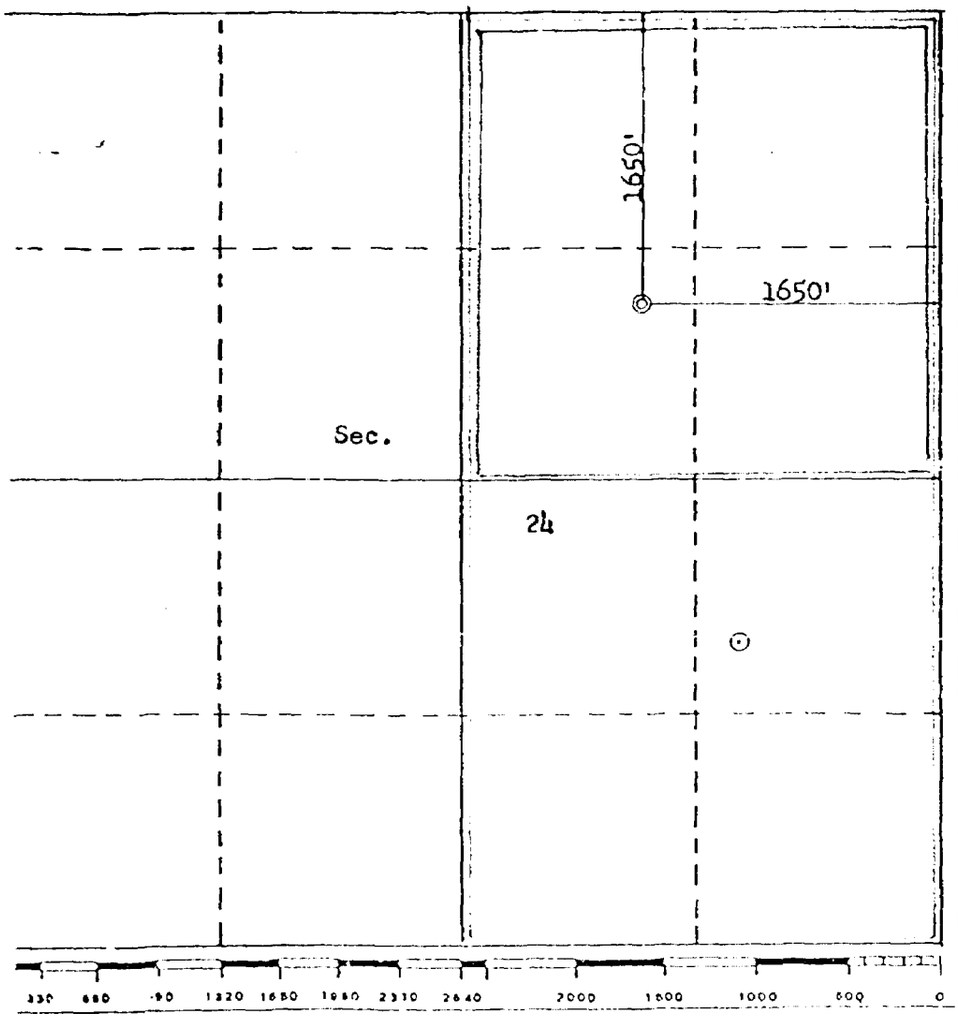
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

3. If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling. etc?

☐ Yes ☐ No If answer is "yes," type of consolidation _____

If answer is "no," list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.) _____

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interests, has been approved by the Commission.



CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Name

Position

Company

Date

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed
February 1, 1980

Registered Professional Engineer and/or Land Surveyor

Fred B. Kerr Jr.

Certificate No. 3950

FRED B. KERR, JR.

OIL CONSERVATION DIVISION

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-102
Revised 10-1-7

All distances must be from the outer boundaries of the Section

Operator	Lease	Well No.
TENNECO OIL COMPANY	MARQUIS G. EATON GAS UNIT "A"	1-E

Unit Letter	Section	Township	Range	County
A	25	29N	11W	San Juan

Actual Footage Location of Well:
990 feet from the North line and 990 feet from the East line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
5457	Dakota	Basin Dakota	Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

3. If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling. etc?

☐ Yes ☐ No If answer is "yes," type of consolidation _____

If answer is "no," list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.) _____

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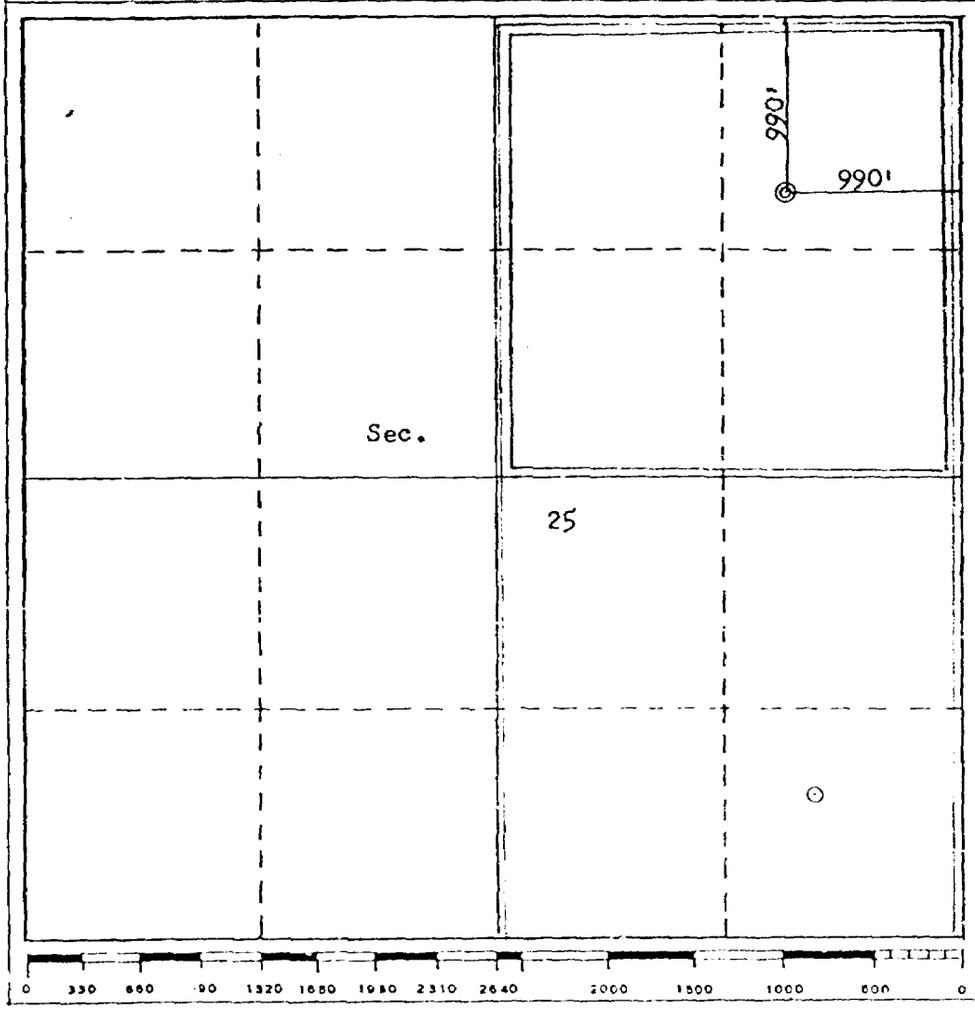


CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Name

Position

Company

Date

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

REGISTERED LAND SURVEYOR
FRED B. KERR JR.

Date Surveyed
September 14, 1979

Registered Professional Engineer and/or Land Surveyor
Fred B. Kerr Jr.

Certificate No.
3950

TENNECO OIL
Penthouse
720 South Colorado Boulevard
Denver, Colorado 80222

WELL LOCATION PLAT AND DESCRIPTION

Well Name VALDEZ COM B-1

Location: ~~1850~~ 825 FSL ~~1850~~ 1670 FEL Section 24, T 29N, R 11W

1/4-1/4-1/4 Section SE NW SE County San Juan State New Mexico

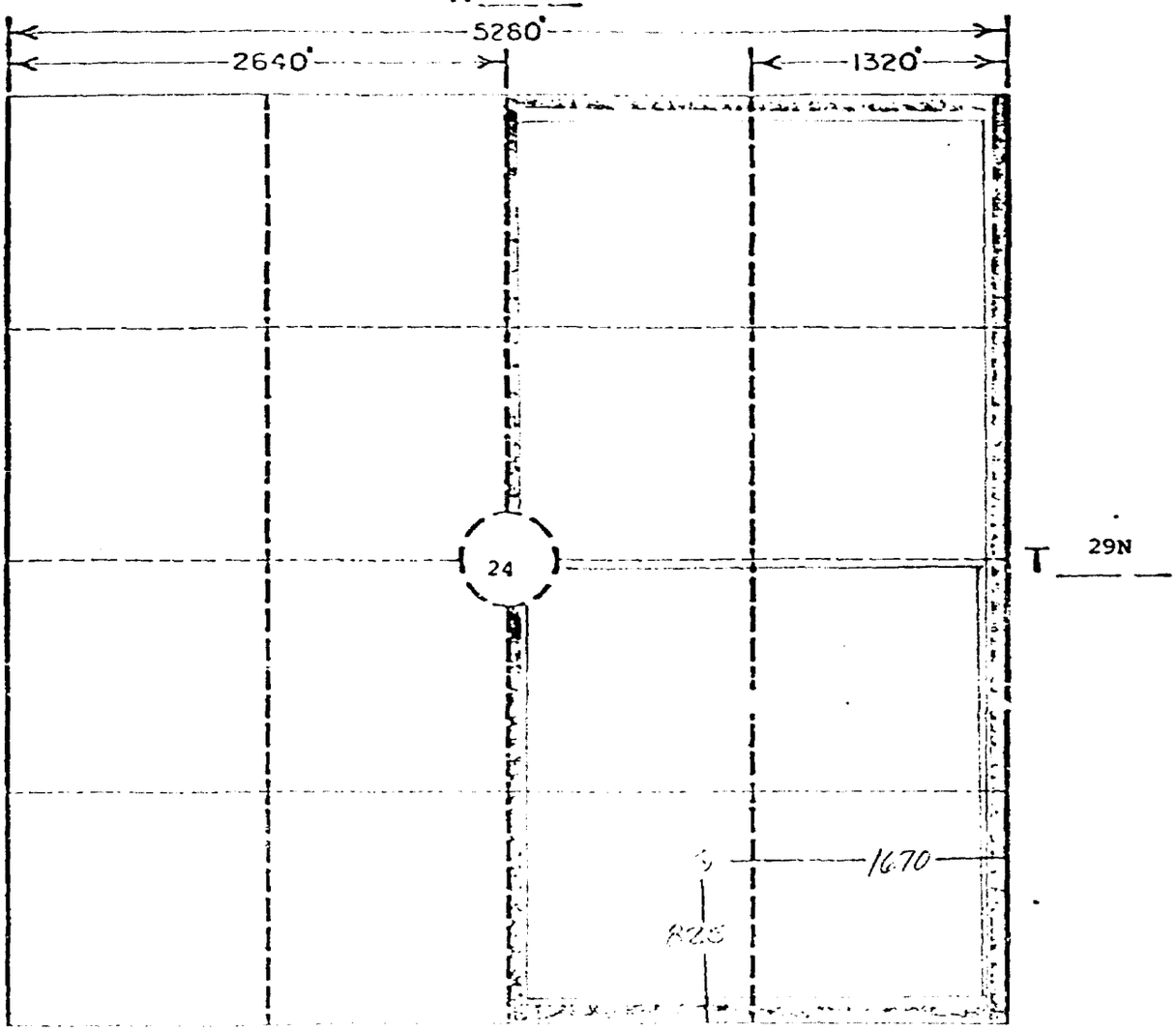
Lease No.: Federal MV 320 State NM 481 482 483 484 530 Fee

Spacing Unit Chacra 160 Acres: Description Mesaverde: E/2 Chacra: SE/4

Location meets State rules Yes Field Rules Yes

Deepest Objective Mesaverde Est. TD 4500 Est. G.L. Elev 5450

Plat Scale: 1" = 1000 ft.



Preferred direction for relocation within legal boundaries shown SE

If relocation of more than 0 feet is necessary, please contact Carol Peavey

in the G.E. Section.

Prepared by Doug Brandon Approved by Original Signed By: R. H. CASTLE Date October 24, 1979

cc: Well File
Land
Properties
Administrative
Drilling

OIL CONSERVATION DIVISION

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-102
Revised 10-1-78

All distances must be from the outer boundaries of the Section

Operator	Lease	Well No.
TENNECO OIL COMPANY	BRUCE SULLIVAN COM B	1

Unit Letter	Section	Township	Range	County
D	25	29N	11W	San Juan

Actual Footage Location of Well:
790 feet from the North line and 790 feet from the West line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
5457			Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

3. If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling. etc?

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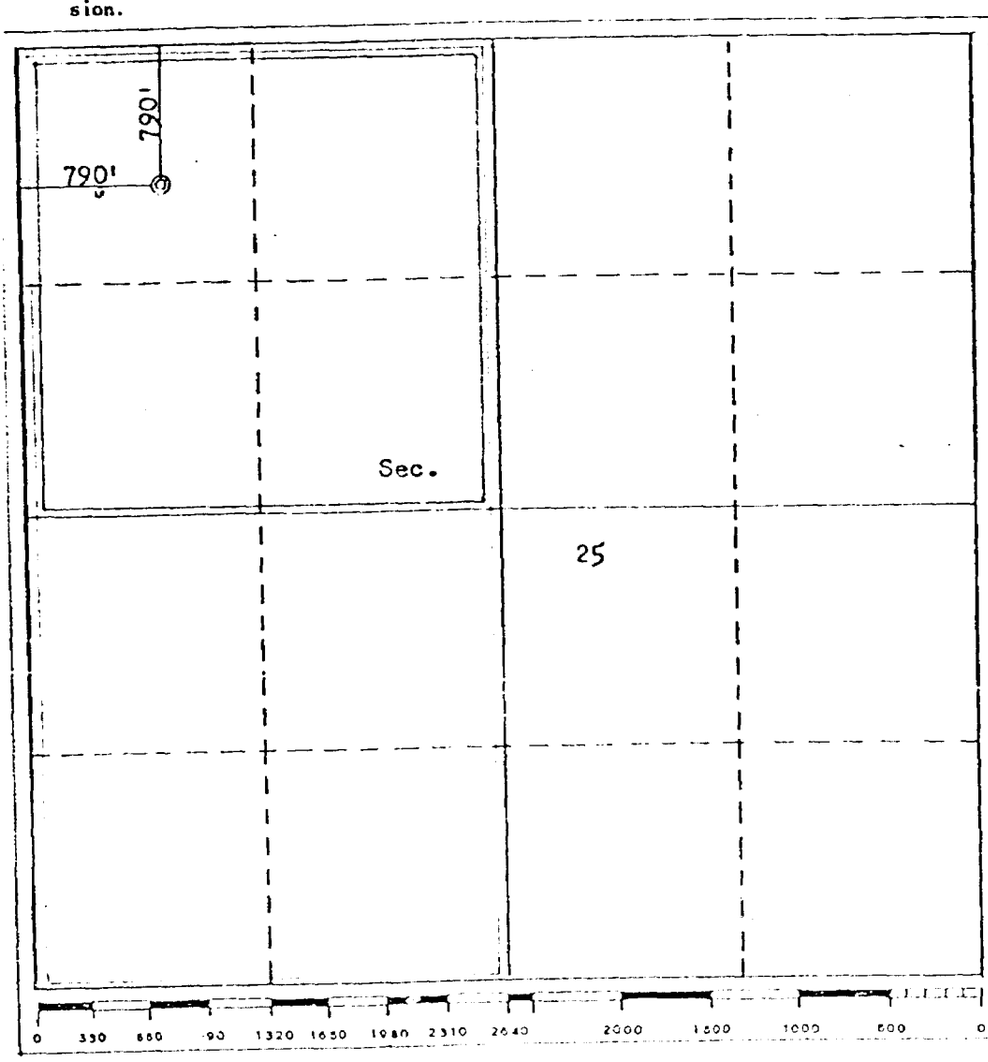

CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Name

Position

Company

Date

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed
November 26, 1979

Registered Professional Engineer and/or Land Surveyor
Fred B. Kerr, Jr.

Certificate No.
3950

REGISTERED LAND SURVEYOR
FRED B. KERR, JR.
3950

OIL CONSERVATION DIVISION

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-102
Revised 10-1-78

All distances must be from the outer boundaries of the Section

Operator	Lease	Well No.
TENNECO OIL COMPANY	SULLIVAN GAS UNIT "A"	1-E

Unit Letter	Section	Township	Range	County
M	25	29N	11W	San Juan

Actual Footage Location of Well:
990 feet from the South line and 990 feet from the West line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
5583			Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

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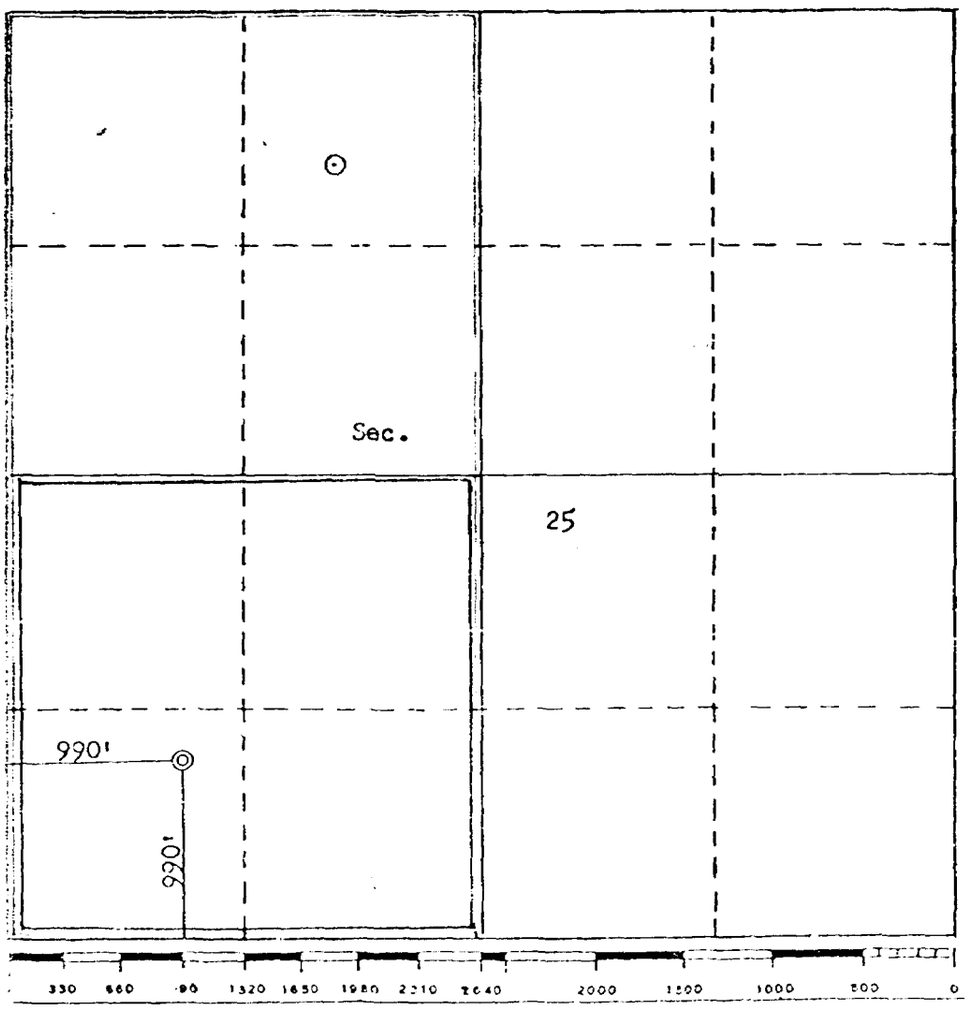

CERTIFICATION

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Name

Position

Company

Date

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed
September 21, 1979

Registered Professional Engineer and/or Land Surveyor:
Fred B. Kerr Jr.

Certificate No.
3950

FRED B. KERR JR. NEW MEXICO 3950 REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR

OIL CONSERVATION DIVISION

STATE OF NEW MEXICO
ENGY AND MINERALS DEPARTMENT

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-102
Revised 10-1-78

All distances must be from the outer boundaries of the Section.

erator	Lease	Well No.
TENNECO OIL COMPANY	EATON COM "B"	1

t Letter	Section	Township	Range	County
P	25	29N	11W	San Juan

tual Footage Location of Well:
1040 feet from the South line and 790 feet from the East line

ound Level Elev.	Producing Formation	Pool	Dedicated Acreage:
5562			Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

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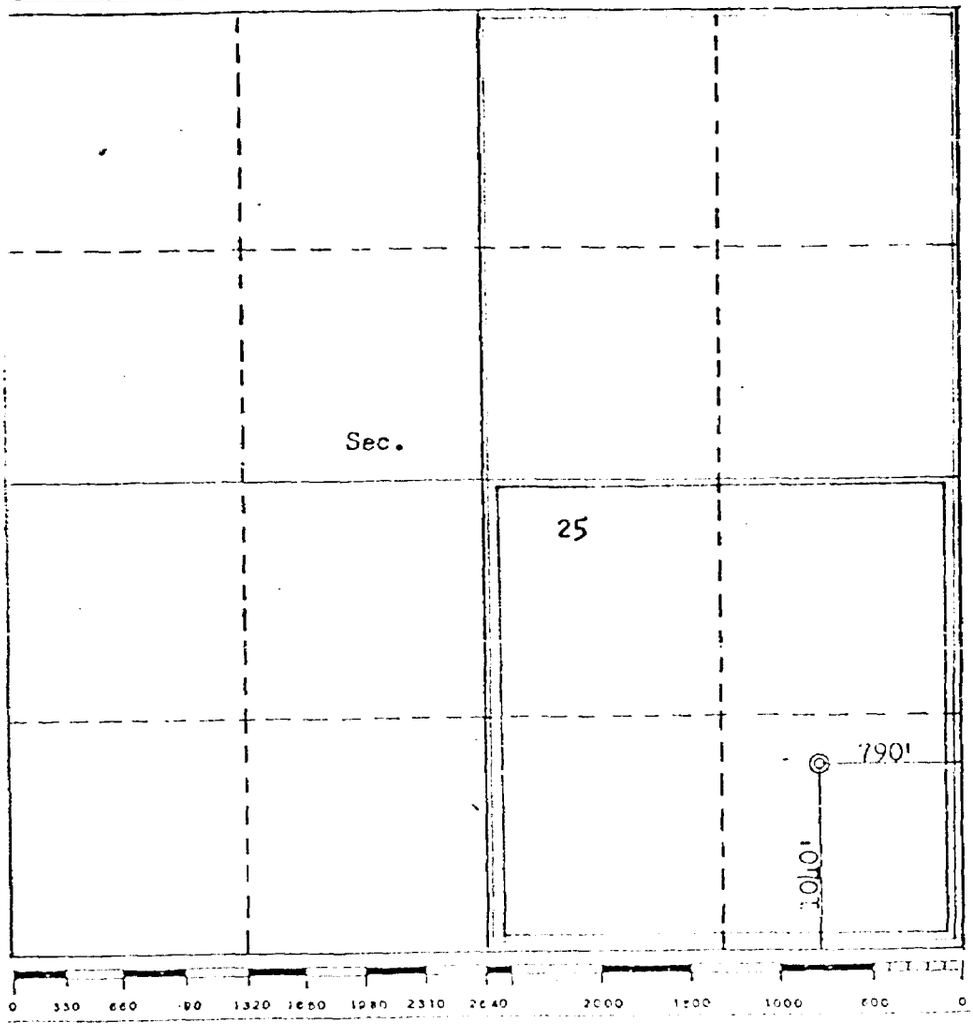

CERTIFICATION

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Name

Position

Company

Date

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

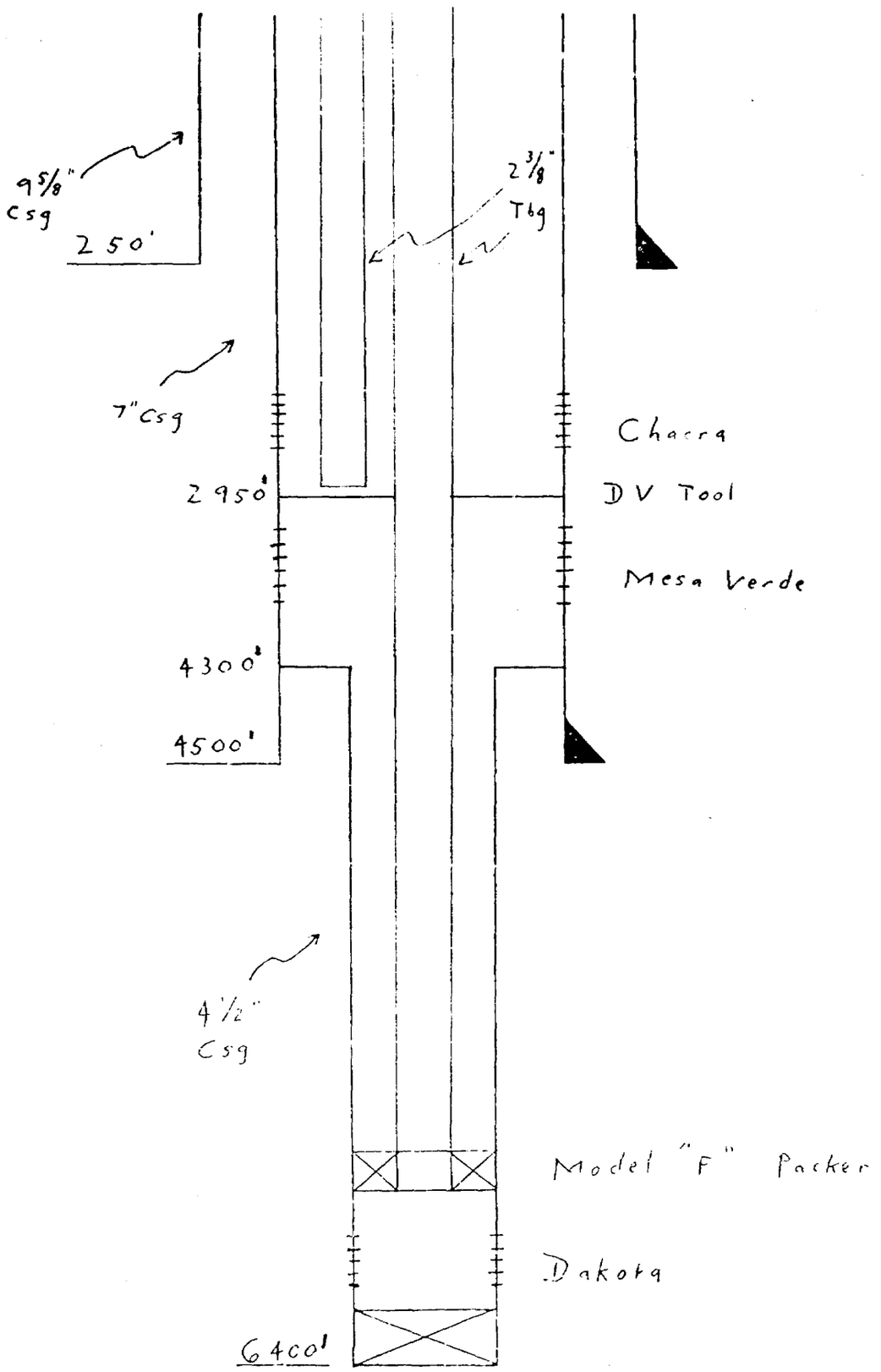
Date Surveyed
November [illegible] 1979

Registered Professional Engineer and/or Land Surveyor
Fred B. Kerr Jr.

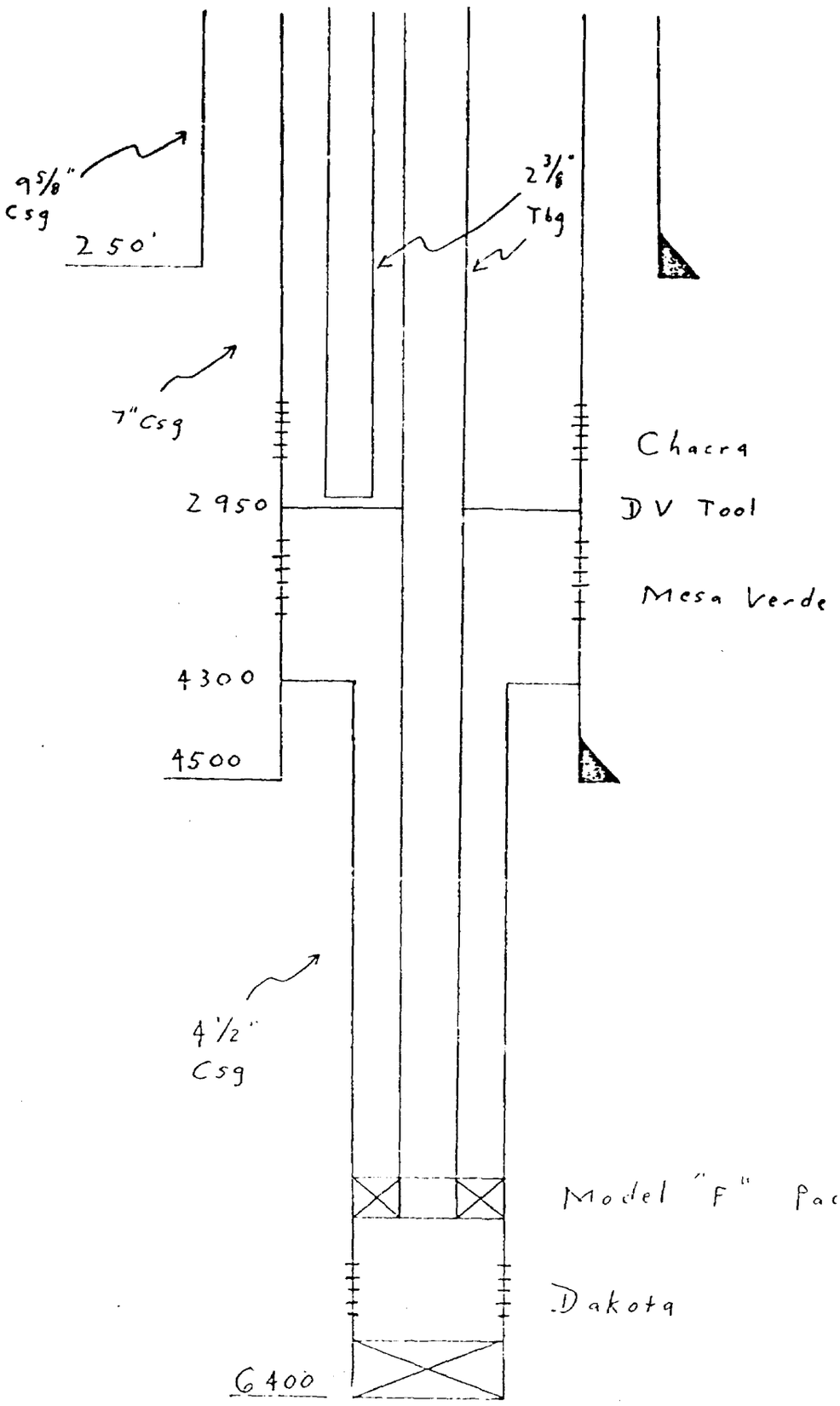
Certificate No.
3950

FRED B. KERR JR. NEW MEXICO

TENNECO OIL COMPANY
BLOOMFIELD AREA
R10+11W, T29N
SAN JUAN COUNTY, NEW MEXICO
DAKOTA DUAL WITH MESA VERDE-CHACRA COMMGLE



TENNECO OIL COMPANY
BLOOMFIELD AREA
R10+11W, T29N
SAN JUAN COUNTY, NEW MEXICO
DAKOTA DUAL WITH MESA VERDE-CHACRA COMMINGLE



STATE OF NEW MEXICO

DEPARTMENT OF ENERGY AND MINERALS

OIL CONSERVATION DIVISION

SANTA FE

IN THE MATTER OF THE APPLICATION OF TENNECO OIL COMPANY FOR DUAL COMPLETION AND DOWNHOLE COMMINGLING, SAN JUAN COUNTY, NEW MEXICO.

Case 6847

APPLICATION

COMES NOW TENNECO OIL COMPANY, by and through its attorneys, KELLAHIN & KELLAHIN, and applies to the New Mexico Oil Conservation Division for approval to drill ten wells in which the Chacra and Mesa Verde production will be commingled and then produced as a dual completion with the Dakota formation, all in San Juan County, New Mexico, and in support thereof would show:

1. Applicant is the operator of each of the units and formations involved in this application as shown on the attached surface plat.

2. Applicant requests approval to commingle production from the Chacra and Mesaverde formations and to dually complete those commingled zones with the Dakota formation for the following wells:

1. Bunce Com Well No. 1, Unit C, Sec. 19, 729N, R10W, NMPM;
2. Elvin J. Faynes Gas Unit "A" Well No. 1-E, Unit N, Sec. 19, T29N, R10W, NMPM;
3. Sullivan Frame Gas Unit "A" Well No. 1-E, Unit A, Sec. 30, T29N, R10W, NMPM;
4. Sullivan Frame Com "B" Well No. 1, Unit D, Sec. 30, T29N, R10W, NMPM;
5. Valdez Gas Unit "A" Well No. 1-E, Unit G, Sec. 24, T29N, R11W, NMPM;
6. Marquis G. Eaton Gas Unit "A" Well No. 1-E, Unit A, Sec. 25, T29N, R11W, NMPM;
7. Valdez Com B-1 Well No. 1, Unit O, Sec. 24, T29N, R11W, NMPM;

8. Bruce Sullivan Com B Well No. 1, Unit D, Sec. 25, T29N, R11W, NMPM;

9. Sullivan Gas Unit "A" Well No. 1-E, Unit M, Sec 25, T29N, R11W, NMPM;

10. Eaton Com "B" Well No. 1, Unit P, Sec. 25, T29N, R11W, NMPM.

Attached hereto and incorporated by reference are Division Forms C-102 for each well.

3. Applicant proposes to dedicate a 320-acre Dakota unit to each well and a 160-acre Chacra-Mesaverde unit to each well as shown on the Form C-102 attached hereto and incorporated by reference.

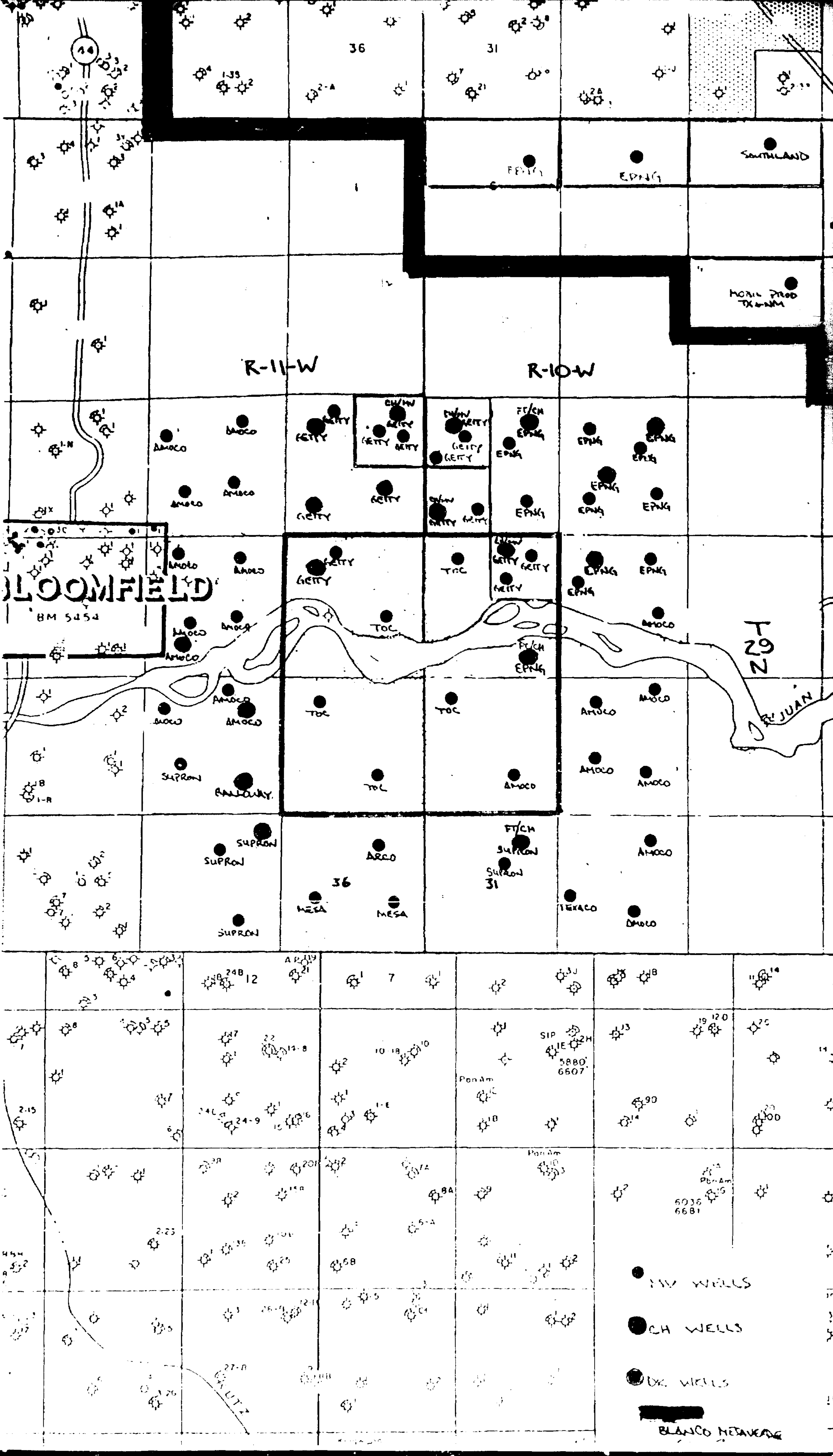
4. Applicant proposes to complete each well as shown on the wellbore schematic attached hereto and incorporated by reference.

5. That approval of the application will be in the best interest of conservation, the prevention of waste and the protection of correlative rights.

WHEREFORE, Applicant requests that this matter be set for hearing and that after notice and hearing, the Division approve the application as requested.

TENNECO OIL COMPANY

By _____
W. Thomas Kellahin
KELLAHIN & KELLAHIN
P. O. Box 1769
Santa Fe, New Mexico 87501
ATTORNEYS FOR APPLICANT



R-11-W
R-10-W
T 29 N
BLOOMFIELD
BM 5454
JUAN
EPNG
SOUTHLAND
MOBIL PROD TX-NM
GETTY
AMOCO
TOC
SUPRON
ARCO
MESA
TEXACO
FT/CH
Pan Am
CH WELLS
BLANCO MESAVERDE

OIL CONSERVATION DIVISION

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-102
Revised 10-1-78

All distances must be from the outer boundaries of the Section

Operator	Lease	Well No.
TENNECO OIL COMPANY	BUNCE COM	1

Unit Letter	Section	Township	Range	County
C	19	29N	10W	San Juan

Actual Footage Location of Well:
990 feet from the North line and 1650 feet from the West line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
5521			Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

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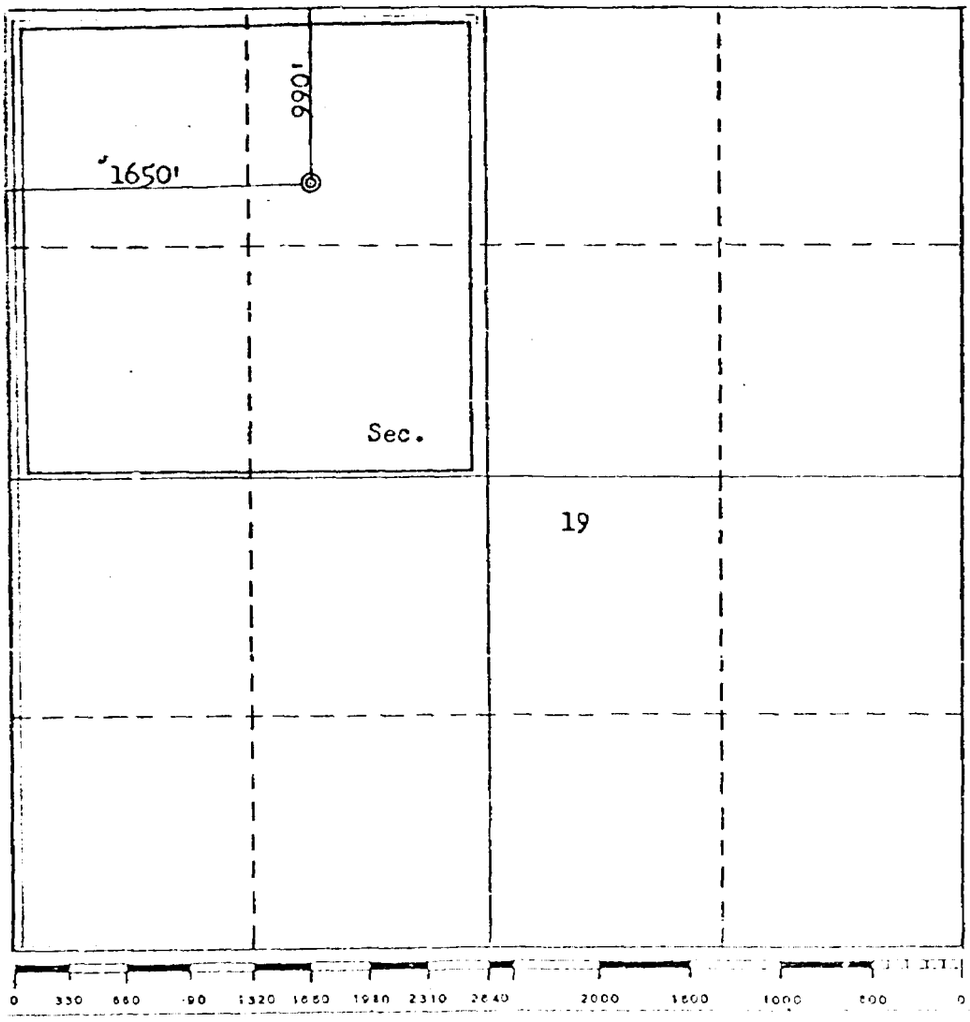

CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Name

Position

Company

Date

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed
November 26, 1979

Registered Professional Engineer and/or Land Surveyor
Fred B. Kerr Jr.

Certificate No.
3950

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-102
Revised 10-1-78

All distances must be from the outer boundaries of the Section

Operator	Lease	Well No.
TENNECO OIL COMPANY	ELVIN J. PAYNE GAS UNIT "A"	1-E

Unit Letter	Section	Township	Range	County
N	19	29N	10W	San Juan

Actual Footage Location of Well:
530 feet from the South line and 2080 feet from the West line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
5476			Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

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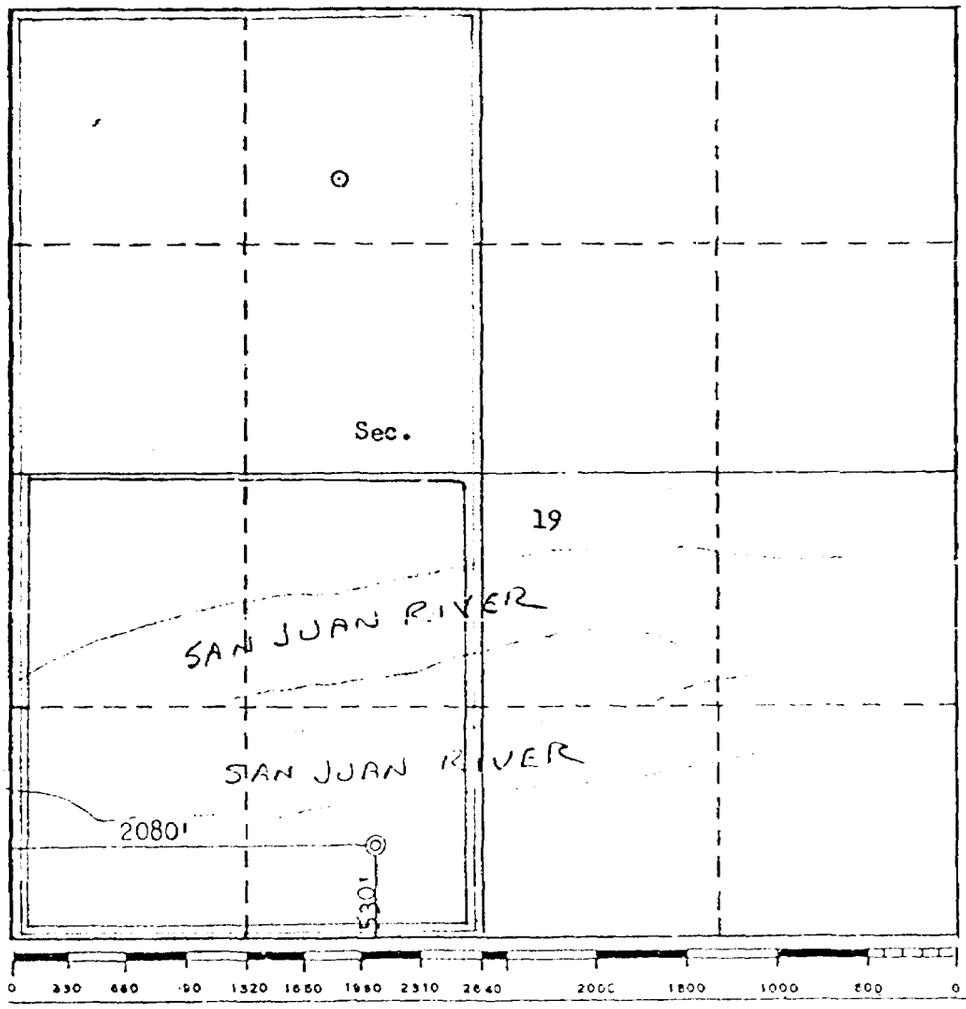

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Date Surveyed
September 13, 1979

Registered Professional Engineer and/or Land Surveyor
Fred B. Kerr Jr.

Certificate No.
3950

REGISTERED LAND SURVEYOR
NEW MEXICO

OIL CONSERVATION DIVISION

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-102
Revised 10-1-78

All distances must be from the outer boundaries of the Section

Operator	Lease	Well No.
TENNECO OIL COMPANY	SULLIVAN FRAME GAS UNIT "A"	1-E

Unit Letter	Section	Township	Range	County
A	30	29N	10W	San Juan

Actual Footage Location of Well:
990 feet from the North line and 790 feet from the East line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
5502	Dakota	Basin Dakota	Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

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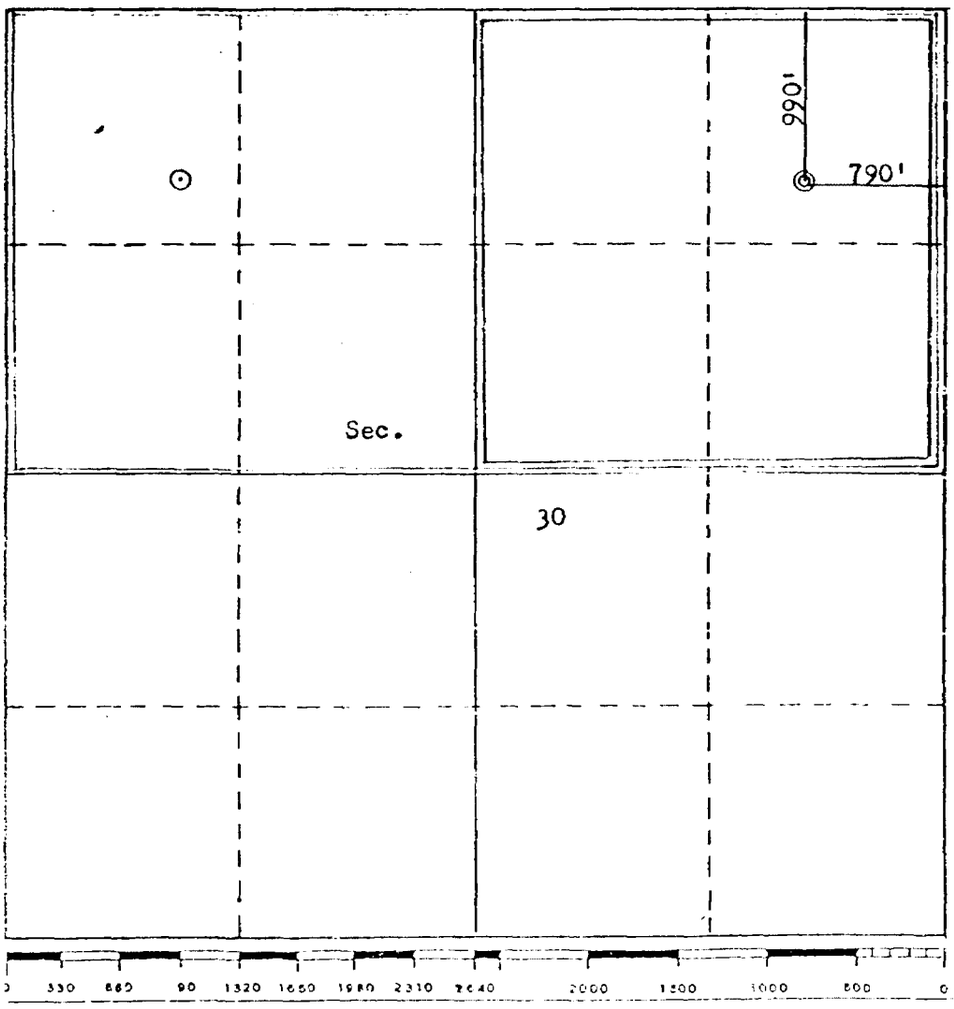

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Name

Position

Company

Date

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Date Surveyed
September 3, 1979

Registered Professional Engineer and/or Land Surveyor
Fred B. Kerr Jr.

Certificate No.
3950

REGISTERED LAND SURVEYOR
NEW MEXICO
3950
FRED B. KERR, JR.

OIL CONSERVATION DIVISION

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-102
Revised 10-1-78

All distances must be from the outer boundaries of the Section

Operator	Lease	Well No.
TENNECO OIL COMPANY	SULLIVAN FRAME COM "B"	1

Unit Letter	Section	Township	Range	County
D	30	29N	10W	San Juan

Actual Footage Location of Well:
1100 feet from the North line and 800 feet from the West line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
5466			Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

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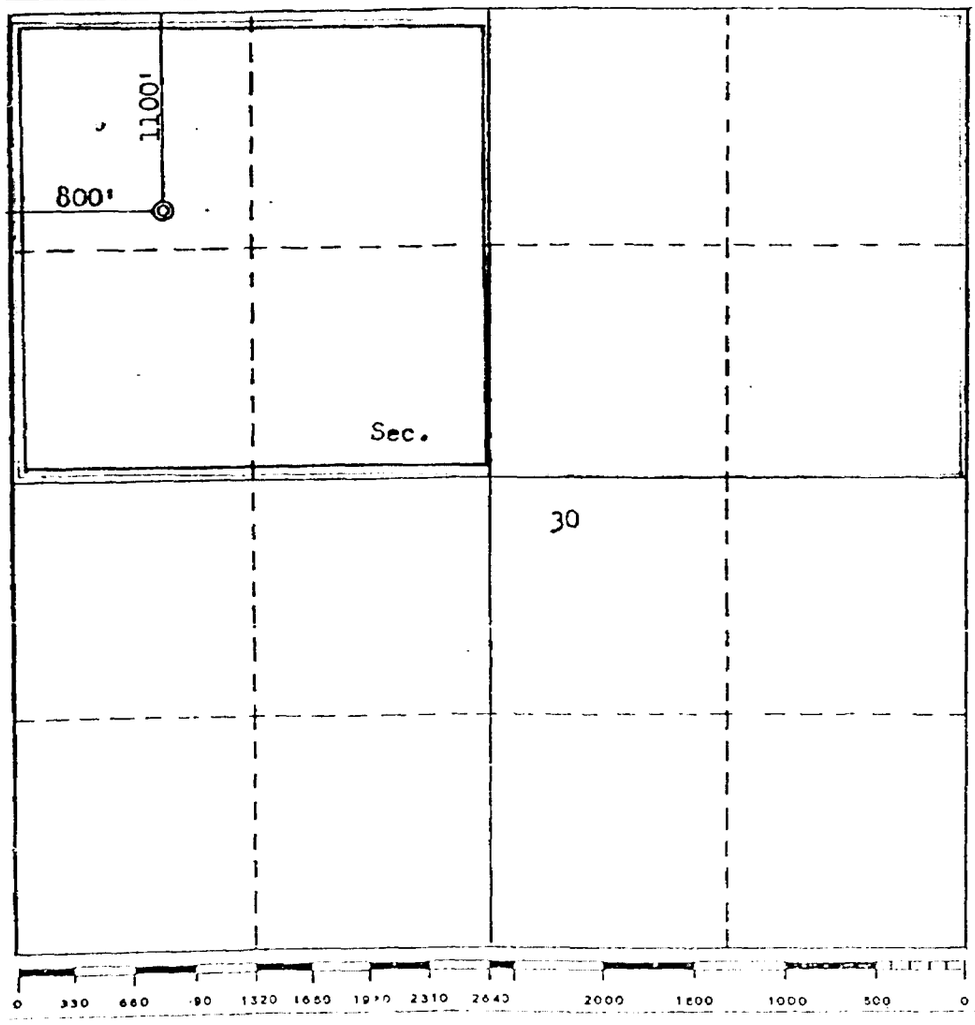

CERTIFICATION

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Name

Position

Company

Date

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Date Surveyed
November 27, 1979

Registered Professional Engineer and/or Land Surveyor

Fred B. Kerr Jr.

Certificate No. 3950

REGISTERED LAND SURVEYOR
FRED B. KERR JR.
NO. 3950

OIL CONSERVATION DIVISION

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-102
Revised 10-1-78

All distances must be from the outer boundaries of the Section

Operator	Lease	Well No.
TENNECO OIL COMPANY	VALDEZ GAS UNIT "A"	1-E

Unit Letter	Section	Township	Range	County
G	24	29N	11W	San Juan

Actual Footage Location of Well:
1650 feet from the North line and 1650 feet from the East line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
5486	Dakota	Basin Dakota	Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

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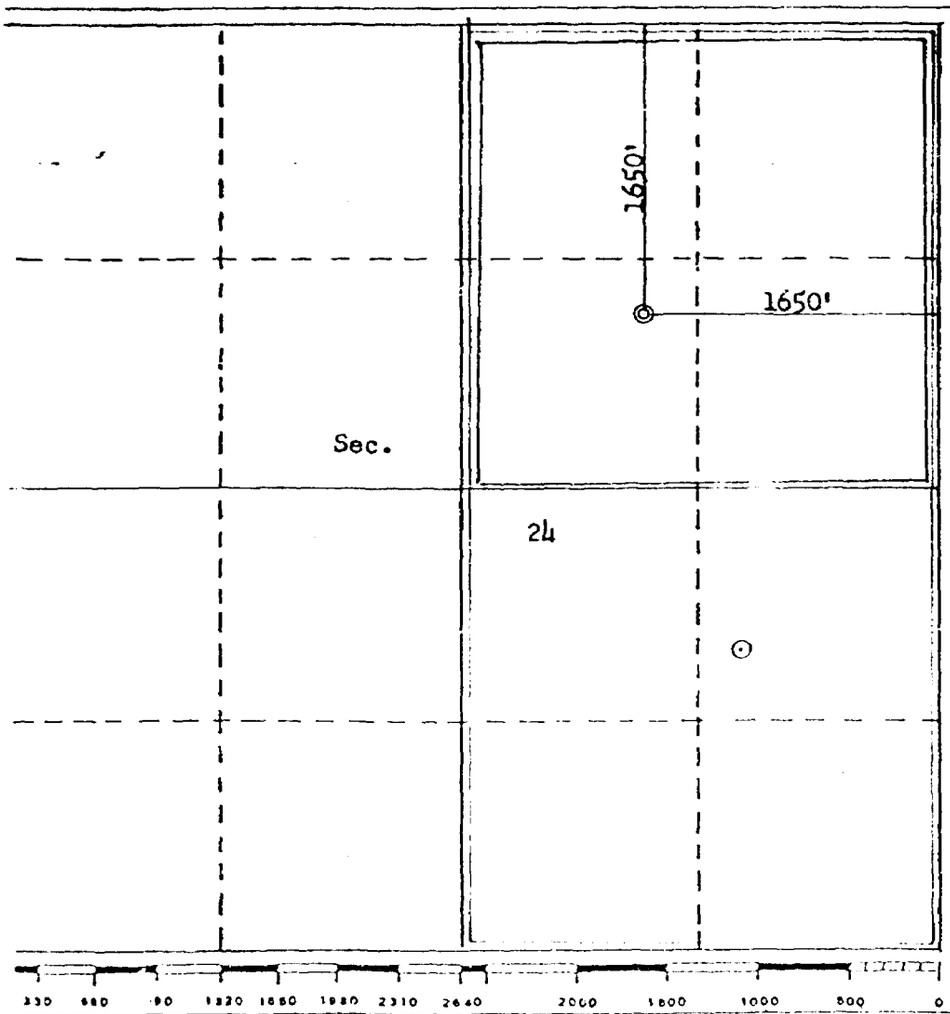

CERTIFICATION

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Name

Position

Company

Date

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed
February 1, 1980

Registered Professional Engineer and/or Land Surveyor

Fred B. Kerr Jr.

FRED B. KERR, JR.

Certificate No.
3950

OIL CONSERVATION DIVISION

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-10
Revised 1

All distances must be from the outer boundaries of the Section

Operator	Lease	Well No.
TENNECO OIL COMPANY	MARQUIS G. EATON GAS UNIT "A"	1-E

Unit Letter	Section	Township	Range	County
A	25	29N	11W	San Juan

Actual Footage Location of Well:
990 feet from the North line and 990 feet from the East line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
5457	Dakota	Basin Dakota	

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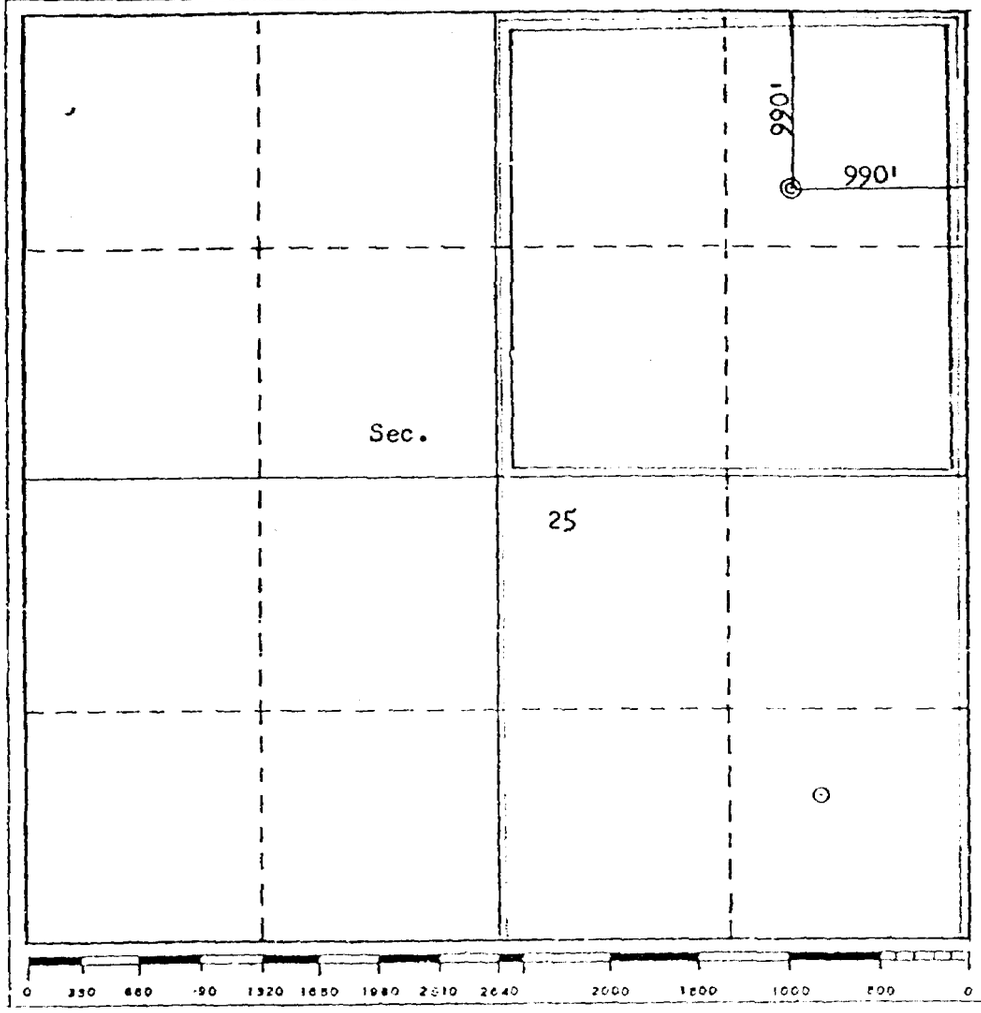


CERTIFICATION

I hereby certify that the information tained herein is true and complete t best of my knowledge and belief.

Name

Position

Company

Date

I hereby certify that the well loc shown on this plat was plotted from notes of actual surveys made by under my supervision, and that the is true and correct to the best knowledge and belief.

REGISTERED LAND SURVEYOR

Date Surveyed
September 11, 1979

Registered Professional Engineer and/or Land Surveyor
Fred B. Kerr Jr.

Certificate No.
3950

TENNECO OIL
Penthouse
720 South Colorado Boulevard
Denver, Colorado 80222

WELL LOCATION PLAT AND DESCRIPTION

Well Name VALDEZ COM B-1

Location: ~~1850~~ 825 FSL ~~1850~~ 1670 FEL Section 24, T 29N, R 11W

1/4-1/4-1/4 Section SE NW SE County San Juan State New Mexico

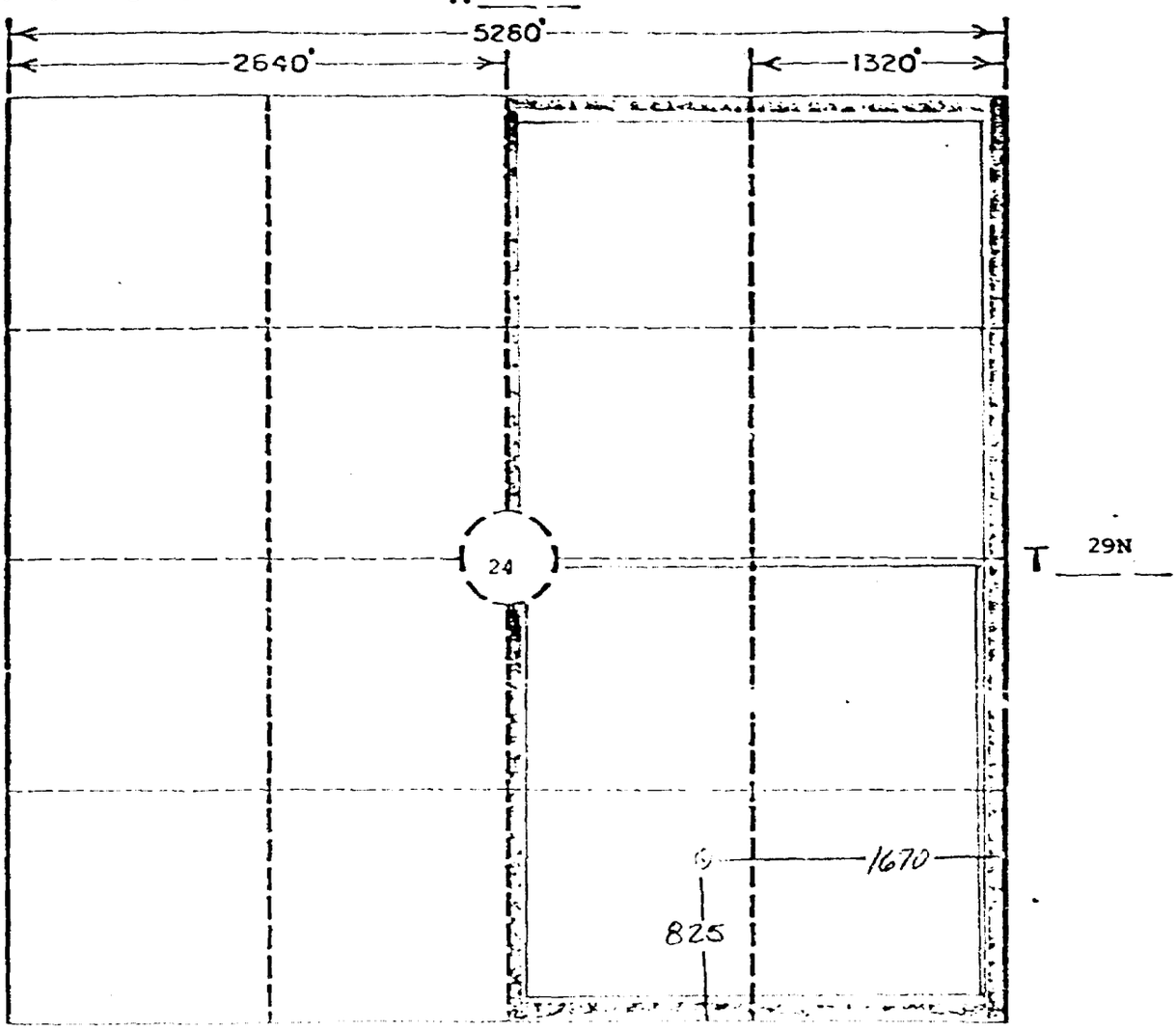
Lease No.: Federal State NM 481 482 483 484 530 Fee

Spacing Unit MV 320 Chacra 160 Acres: Description Mesaverde: E/2 Chacra: SE/4

Location meets State rules Yes Field Rules Yes

Deepest Objective Mesaverde Est. TD 4500 Est. G.L. Elev. 5450

Plat Scale: 1" = 1000 ft.



Preferred direction for relocation within legal boundaries shown SE

If relocation of more than 0 feet is necessary, please contact Carol Peavey

in the G.E. Section.

Prepared by Doug Brandon Approved by Original Signed By: R. H. CASTLE Date October 24, 1979

cc: Well File
Land
Properties
Administrative
Drilling

OIL CONSERVATION DIVISION

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-102
Revised 10-1-78

All distances must be from the outer boundaries of the Section.

Operator	Lease	Well No.
TENNECO OIL COMPANY	BRUCE SULLIVAN COM B	1

Unit Letter	Section	Township	Range	County
D	25	29N	11W	San Juan

Actual Footage Location of Well:
790 feet from the North line and 790 feet from the West line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
5457			Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

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If answer is "no," list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.) _____

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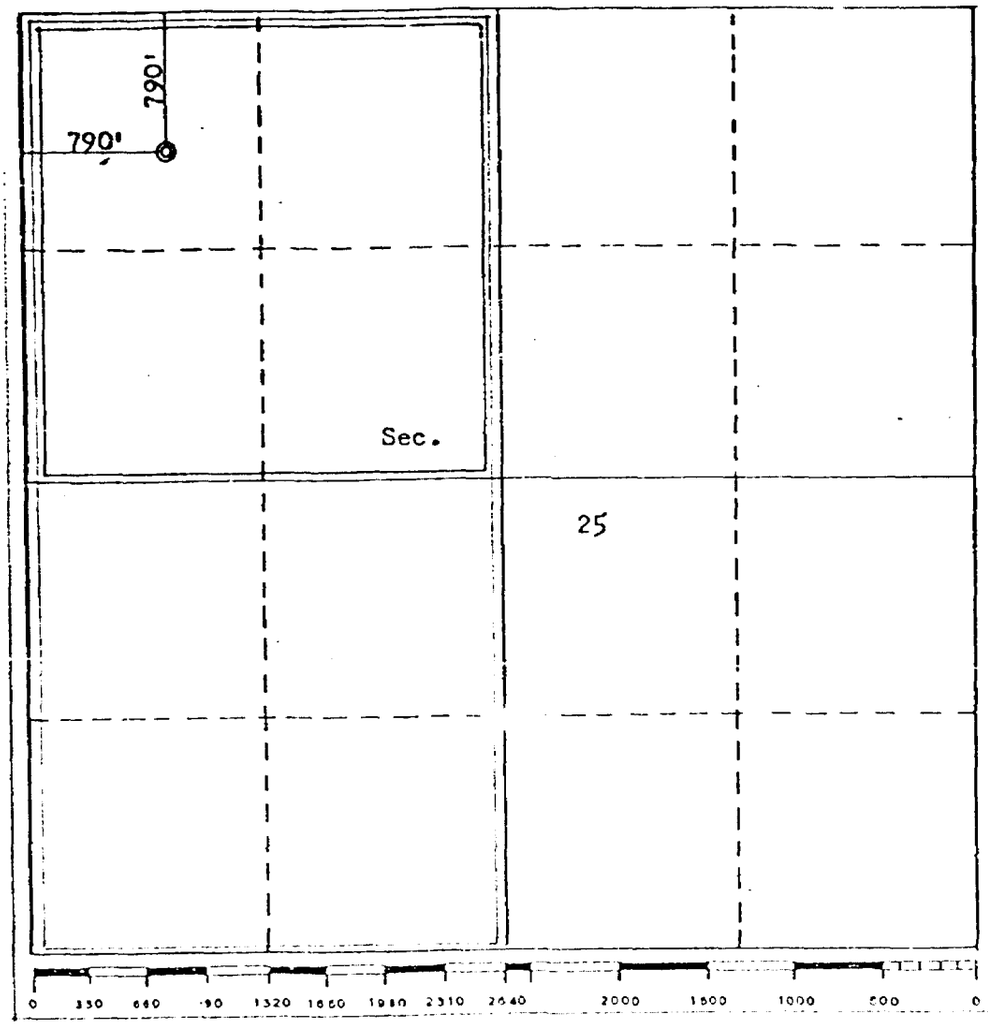


CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Name

Position

Company

Date

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed
November 26, 1979

Registered Professional Engineer and/or Land Surveyor
Fred B. Kerr, Jr.

Certificate No.
3950

REGISTERED LAND SURVEYOR
FRED B. KERR, JR.

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-102
Revised 10-1-78

All distances must be from the outer boundaries of the Section

Operator	Lease	Well No.
TENNECO OIL COMPANY	SULLIVAN GAS UNIT "A"	1-E

Unit Letter	Section	Township	Range	County
M	25	29N	11W	San Juan

Actual Footage Location of Well:
990 feet from the South line and 990 feet from the West line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
5583			Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

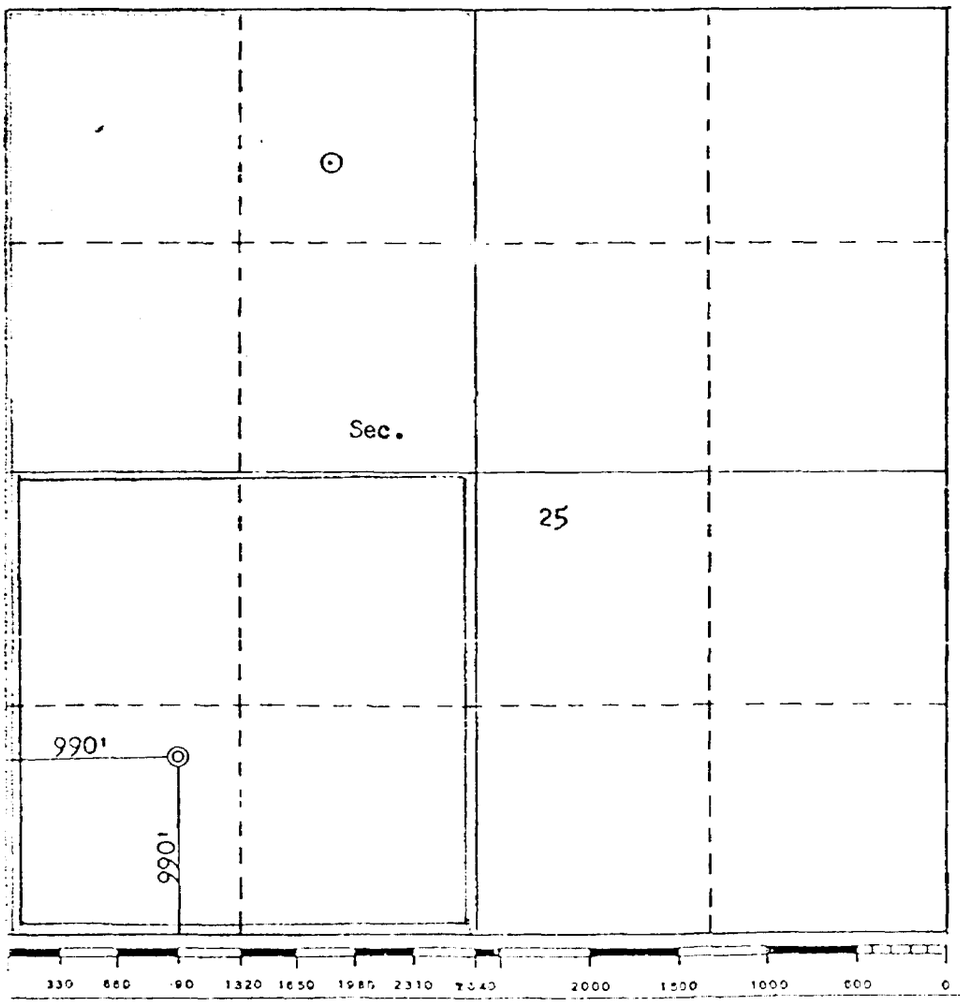
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

3. If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling. etc?

☐ Yes ☐ No If answer is "yes," type of consolidation _____

If answer is "no," list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.) _____

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interests, has been approved by the Commission.



CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Name

Position

Company

Date

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed
September 3, 1979

Registered Professional Engineer and/or Land Surveyor
Fred B. Kerr Jr.

Certificate No.
3950

FRED B. KERR, JR.
NEW MEXICO
REGISTERED
PROFESSIONAL
SURVEYOR

OIL CONSERVATION DIVISION

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-102
Revised 10-1-78

All distances must be from the outer boundaries of the Section.

Operator	Lease	Well No.
TENNECO OIL COMPANY	EATON COM. "B"	1

Unit Letter	Section	Township	Range	County
P	25	29N	11W	San Juan

Actual Footage Location of Well:
1040 feet from the South line and 790 feet from the East line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
5562			Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

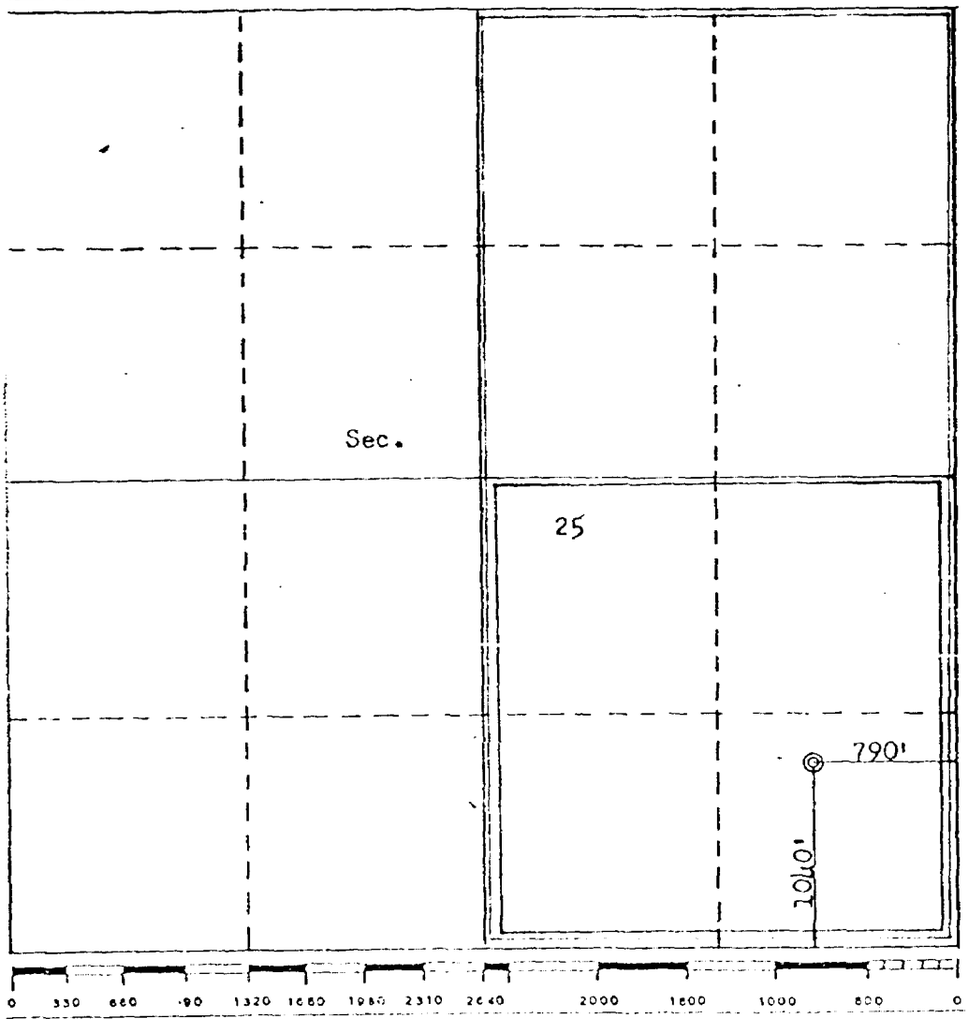
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

3. If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling. etc?

☐ Yes ☐ No If answer is "yes," type of consolidation _____

If answer is "no," list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.) _____

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interests, has been approved by the Commission.



CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Name

Position

Company

Date

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

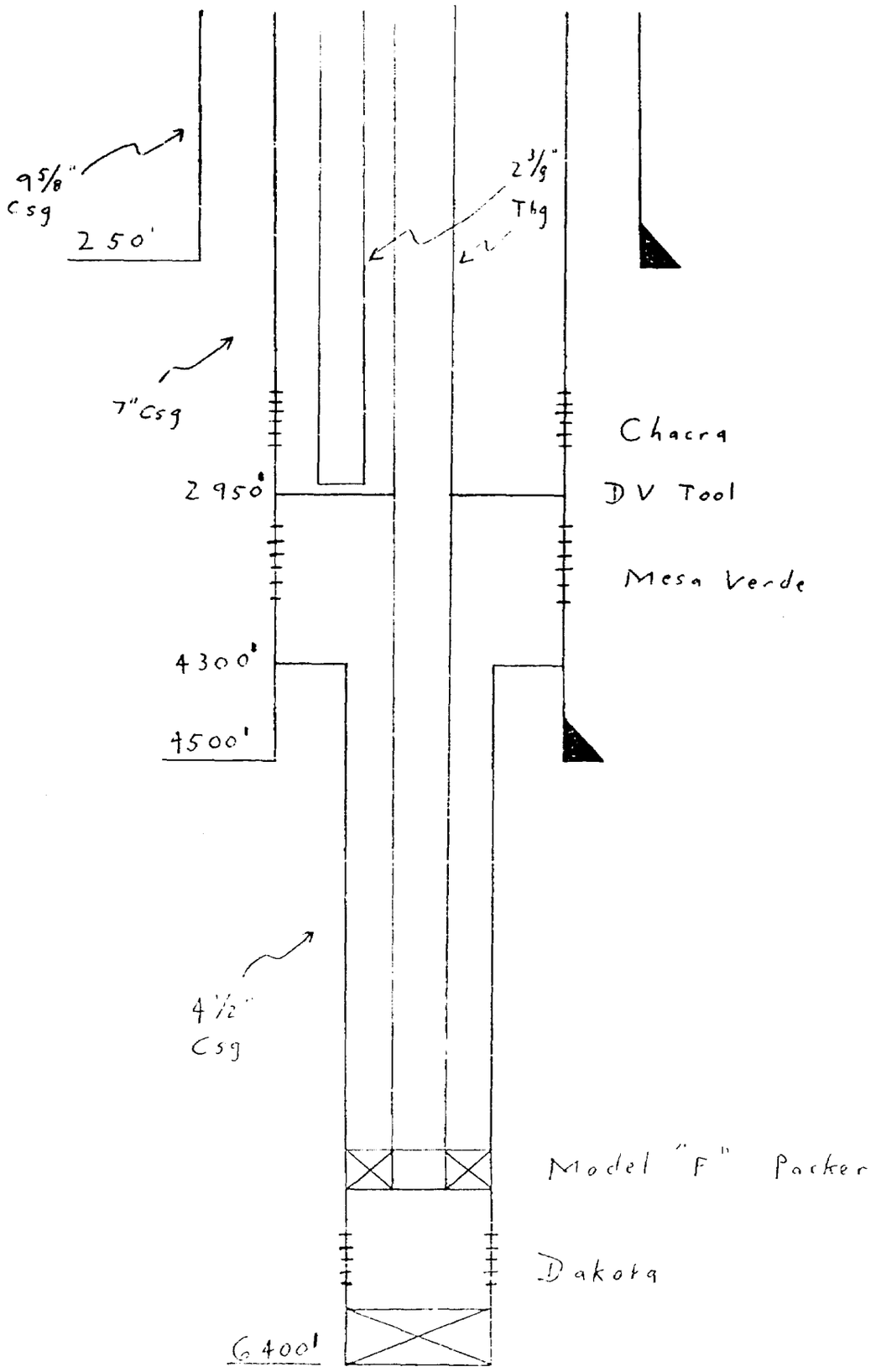
Date Surveyed
November 20, 1979

Registered Professional Engineer and/or Land Surveyor
Fred B. Kerr Jr.

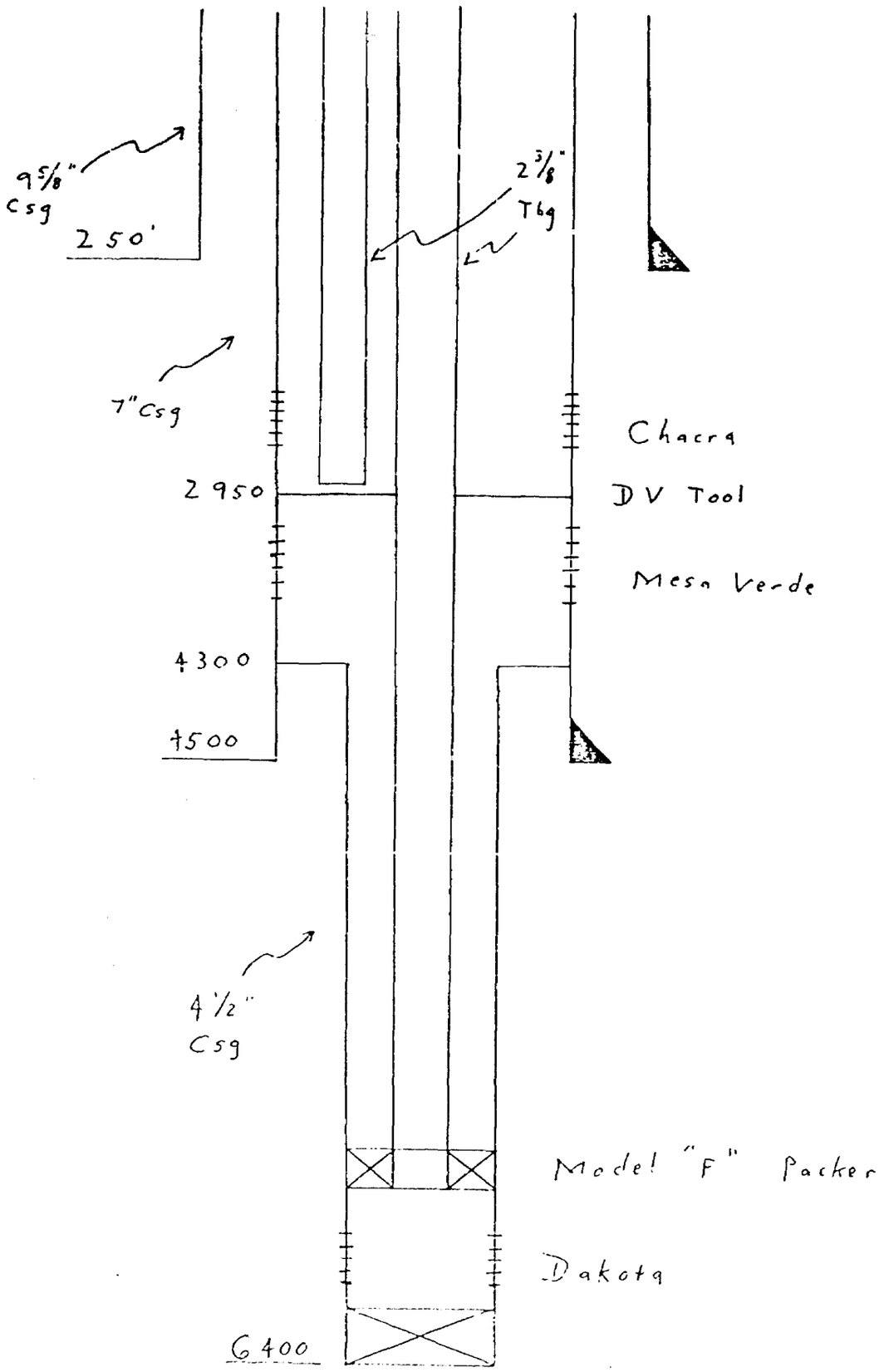
Certificate No.
3950

FRED B. KERR, JR. NEW MEXICO

TENNECO OIL COMPANY
BLOOMFIELD AREA
R10+11W, T29N
SAN JUAN COUNTY, NEW MEXICO
DAKOTA DUAL WITH MESA VERDE-CHACRA COMMINGLE



TENNECO OIL COMPANY
BLOOMFIELD AREA
R10+11W, T29N
SAN JUAN COUNTY, NEW MEXICO
DAKOTA DUAL WITH MESA VERDE-CHACRA COMMINGLED



ROUGH

dr/

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:

CASE NO. 6847

Order No. R- 6313

APPLICATION OF TENNECO OIL COMPANY FOR A DUAL COMPLETIONS AND DOWNHOLE COMMINGLING, SAN JUAN COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 9 o'clock a.m. on March 26, 1980, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this _____ day of _____, 1980, the Division Director, 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 Division has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Tenneco Oil Company, dually seeks authority to complete, in such a manner as to produce gas from the Dakota formation and commingled Chacra and Mesaverde production through parallel strings of tubing, ten proposed wells to be located as follows:

in Township 29 North, Range 10 West: Unit C, Section 19; Unit N, Section 19; Unit A, Section 30; and Unit D, Section 30; in Township 29 North, Range 11 West: Unit G, Section 24; Unit O, Section 24; Unit A, Section 25; Unit D, Section 25; Unit M, Section 25; and Unit P, Section 25.

(3) That at the hearing the applicant amended the subject application to eliminate the request for dual completion of the commingled Chacra/Mesaverde zones with the Dakota zone for five of the proposed wells to be located as follows: in Township 29 North, Range 10 West: Unit G, Section 19 and Unit D, Section 30; in Township 29 North Range 11 West: in Unit J, Section 24; Unit D, Section 25; and Unit P, Section 25.

(4) That the Chacra and Mesaverde zones in each of the ten wells proposed to be drilled are expected to be capable of low rates of production.

(5) That the proposed commingling may result in the recovery of additional hydrocarbons from each of the subject pools, thereby preventing waste and will not violate correlative rights.

(6) That the reservoir characteristics of each of the subject zones are such that underground waste would not be caused by the proposed commingling provided that any such well is not shut-in for an extended period.

(7) That to afford the Division the opportunity to assess the potential for waste and to expeditiously order appropriate remedial action, the operator should notify the Aztec district office of the Division any time any of the subject wells is shut-in for 7 consecutive days.

(8) That in order to allocate the commingled production to each of the commingled zones in the wells, applicant should consult with the supervisor of the Aztec district office of the Division and determine an allocation formula for each of the production zones.

(9) That the mechanics of the proposed dual completions are feasible and in accord with good conservation practices.

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

IT IS THEREFORE ORDERED:

(1) That the applicant, Tenneco Oil Company, is hereby authorized to commingle Chacra and Mesaverde production within the wellbore of ~~the~~ Ten proposed wells to be, located ~~in Unit~~ as follows: ~~of~~

in Township 29 North, Range 10 West: Unit C, Section 19; Unit N, Section 19; Unit A, Section 30; and Unit D, Section 30; in Township 29 North, Range 11 West: Unit G, Section 24; Unit O, Section 24; Unit A, Section 25; Uhit D, Section 25; Unit M, Section 25; and Unit P, Section 25; all in San Juan County New Mexico

(2) That the applicant is further authorized to dually complete in such a manner as to produce gas from the commingle Chacra and Mesaverde zones and gas from the Dakota zone ~~the~~ five of said wells ~~described~~ located as follows: in Township 29 North, Range 10 West: Unit N, Section 19; Unit A, Section 30; in Township 29 North, Range 11 West: Unit G Section 24; Unit P Section 25; and Unit M Section 25, each of said wells being equipped with parallel strings of tubing and a packer between the commingled zones and the Dakota.

PROVIDED HOWEVER, that the applicant shall complete, operate, and produce said wells in accordance with the provisions of Rule 112-A of the Division Rules and Regulations insofar as said rule is not inconsistent with this order;

PROVIDED FURTHER, that the applicant shall take Packer leakage tests upon completion and annually thereafter during the ~~Gas~~ Deliverability Test Period for ~~the~~ gas wells in Northwest New Mexico. ~~Pool~~.

(3) ~~(2)~~ That the applicant shall consult with the Supervisor of the Aztec district office of the Division and determine an allocation formula for the allocation of production to each zone in each of the subject wells.

(ALTERNATE)

(2) That _____ percent of the commingled _____ production shall be allocated to the _____ zone and _____ percent of the commingled _____ production shall be allocated to the _____ zone.

(4) ~~(3)~~ That the operator of the subject well shall immediately notify the Division's Aztec district office any time any of the commingled well has been shut-in for 7 consecutive days and shall concurrently present, to the Division, a plan for remedial action.

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

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

CASE 6847: TENNECO OIL COMPANY FOR DUAL COMPLETIONS AND DOWNHOLE COMMINGLING, SAN JUAN COUNTY, NEW MEXICO