STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO

25 June 1986

EXAMINER HEARING

IN THE MATTER OF:

Application of Tenneco Oil Company for directional drilling, San Juan County, New Mexico. CASE 8915

BEFORE: Michael E. Stogner, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation Division: Jeff Taylor
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I N D E X

E X H I B I T S

MR. STOGNER: This hearing will come to order.

We'll call next Case Number 8915, which is the application of Tenneco Oil Company for directional drilling, San Juan County, New Mexico.

Call for appearances.

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of Santa Fe, New Mexico, appearing on behalf of the applicant and I have three witnesses to be sworn.

MR. STOGNER: Are there any other appearances in this matter?

Will all three witnesses please stand at this time and raise your right hands?

(Witnesses sworn.)

MR. STOGNER: Mr. Kellahin?

MR. KELLAHIN: Thank you, Mr. Examiner.

KEVIN G. HERINGER,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Heringer, would you please state your name and occupation?

A My name is Kevin G. Heringer. I'm a landman for Tenneco Oil Company from Denver, Colorado.

Q And would you spell your last name for the examiner, please?

A H-E-R-I-N-G-E-R.

Q Mr. Heringer, have you testified as a petroleum landman before the Oil Conservation Division or the Commission on previous occasions?

A Yes, I have.

Q With regards to the application of Tenneco Oil Company, are you one of the landmen responsible for compiling the necessary land matters for presentation to the Division?

A Yes, I am.

Q Are you familiar with the background of the application and what Tenneco seeks to accomplish?

A Yes.

Q I have given to the examiner an exhibit book that is labeled Exhibit One and the pages of the book are numbered one through ninety-six. I don't propose to ask

you questions about all the pages but when we refer to the Exhibit Number One will direct your attention to various pages within the exhibit book.

Would you describe for the examiner at this point generally how the book of exhibit information is organized?

A What we've done is Tenneco proposes to drill four Basin Dakota gas wells in Section 10, Township 29 North, Range 13 West.

The book is set up with notices in the front part of the book, per state requirement, and notices to surface owners within 100 feet, which is a requirement by the City of Farmington.

These are all common for all four wells and we've -- we've put them together.

Then we break out each individual well in this -- in its own section. The first page would just explain what Tenneco proposes to do. We have a vicinity map showing where this is located in the City of Farmington; a surface location in relation to bottom hole location; geologic information; and then the drilling data which will be presented later.

Q All right. Let me have you direct your attention to page number 12, and let's use that page to orient the examiner as to what Tenneco specifically seeks.

First of all, let's have you describe what the applicant is seeking.

A Okay. The applicant is seeking to drill four Dakota -- Basin Dakota wells.

The first two will be drilled in the fourth quarter of 1986. The second two will be drilled in the fourth quarter of 1987, on this parcel of land in Section 10.

To give you a little history, Section 10 is located in the City of Farmington, New Mexico. This tract is 4.6 acres located in the northwest quarter of the southeast quarter of Section 10.

Q That's the tract that's shaded in yellow on page twelve?

A Yes.

Q All right. And this --

A Tenneco --

Q -- will serve as a drilling island, then, from which you will have four wells located at the surface within the 4-acre tract and you'll directionally drill the four separate wells to bottom hole locations in the Dakota -- Basin Dakota Gas Pool.

A That's correct.

Q Okay.

A I might point out that all bottom hole lo-

cations are standard.

Q Okay.

A The reason this site was chosen, as I said, the land is located in the City of Farmington. What we did at Tenneco is we took an aerial photo of Section 10. Our Land, Drilling Department, and Production Department, worked together to find a location -- four individual locations that we could drill these wells from.

A major requirement by the City of Farmington is that all wells and storage tanks must be set back at least 200 feet from any residential or commercial buildings.

This parcel of land was picked because it will allow Tenneco to drill all four wells and meet the 200-foot setback requirement.

Q What is the current status of the applications of Tenneco with regard to the City of Farmington approval process?

A We've had an on-going dialogue with the City of Farmington.

Tenneco's people met with the Planning and Zoning Commission on June 12th in regards to drilling of these four wells. The Zoning Board approved the drilling of these wells by a vote of six to two.

We are scheduled to meet before the City

Council on or around July 9th, the exact date is not known yet, where the people of the city will be able to present their cases to us.

Q Let's talk about the specifics of this application insofar as your work concerns notification to the offset operators and the surface owners.

In that regard let me direct your attention to page number 10 and have you identify that plat.

A Page number ten is a plat of Tenneco's parcel of land, showing Tenneco's drillsites. The 100-foot radius around Tenneco's property line was required by the City Council to nofity all surface owners within this 100 feet. This is a drawing of the 100-feet surface owners.

Q Okay, and have you used that same notice requirement with regards to notifying surface owners of the Oil Conservation Division application today?

A Yes, we have. These were mailed out certified mail on June 4th, 1986.

Q Starting on page 7 and going through 8 and 9, does that represent a tabulation of the names, addresses, and tract descriptions for those surface owners within 100 feet of the proposed drillsites?

A Yes. These names were provided to Tenneco by Guardian Abstract and Title Company in Farmington, New Mexico.

Q And the certified mailed notices were sent out under your direction and control --

A Yes.

Q -- or on behalf of Tenneco?

A Yes, sir.

Q With regard to notification of offset operators, Mr. Heringer, let me direct your attention to page number 6. Have you provided similar notification to those offset operators?

A Yes, these operators were also notified in the June 4th, 1986, letter.

Q At this point let me ask you whether or not you are aware of or have received any objections from any of the surface owners or any of the offset operators with regards to the application before the Division?

A Yes, we have. In front of me I have an objection by the Rusty Sun Townhomes, which are located just south of our drillsite. They are greater than the 200-foot setback requirement by the City of Farmington.

Q Would you describe for the examiner what, if any, efforts have been made by Tenneco and Tenneco personnel to explain the drilling prospect to these people or give they an opportunity or a forum to air their complaints about the project?

A Okay, the City of Farmington requires a

number of requirements. Each requirement has been addressed by Tenneco. These people will have a chance to voice their opinion at the City Council meeting; some voiced it at the Zoning and Planning Commission meeting on June 12th and they'll have another chance at the City Council meeting on July 9th, 1986.

We are aware of these people's concern. We feel that we are working with them as best we can. The city has very strong requirements. Before we drill the well we will have to meet the city requirements.

Q One of the, apparently the only request that's in the Commission case file for this case is a telegram dated yesterday and sent to the Commission by Charles L. Pearson, in which he requests that this application be postponed.

Do you have any comments on behalf of your company with regard to a postponement of action or a decision or a hearing on this application?

A Yes. I think postponement would not be a good idea.

One agreement that we have come to with the City of Farmington is that we will drill these wells in the winter months, thus limiting outdoor noise. The feeling is these people will be indoors during November, December, and January.

We have these wells proposed for November. If we move it back we could be looking at next April or May. It in no way will help (not clearly understood).

Q Does the city also limit the drilling hours in a day that the activity can take place on a wellsite?

A Yes, they do.

Q You're limited to daylight hours and you don't drill through the night?

A I believe we will drill through the night. Completion cannot be done during the daytime hours.

Q The City of Farmington rules and regulations with regards to drilling in the city, do you have a copy of those rules and regulations?

A Yes, I do.

MR. KELLAHIN: We'll be happy to share with you a copy of the rules and regulations, if you'd like to have them.

MR. STOGNER: I would like to have a copy of them, if you could provide that we'd appreciate it.

MR. KELLAHIN: Okay, we'll be happy to do that.

Q What is the next process with regards to

getting all your approvals from the Oil Conservation Division in order to commence the well, apart from the current hearing? Are there any other requirements that you need to fulfill?

A As to?

Q Forming a voluntary unit on a 320-acre basis of all the working interest owners?

A Yes. We will enter into a compulsory hearing for forced pooling, of which right now we have -- we have over 1200 leases in the Section 10 and there's a number of parties that are not interested in leasing to Tenneco, so we will have to manage a --

Q So before drilling can commence, then, apart from approval of the surface location and the directional drilling, you have to complete a forced pooling order with regards to certain unleased interest owners among the city lots involved in the acreage?

A Yes, that's correct.

Q All right.

MR. KELLAHIN: That concludes my examination of Mr. Heringer, Mr. Examiner.

CROSS EXAMINATION

BY MR. STOGNER:

Q Mr. Heringer, the opposition or the tele

gram that you alluded to, that was the one that came to me yesterday, is that correct?

A Yes.

Q And this is the only objection you've received for the directional drilling?

A For the directional drilling, yes.

Q Or any -- let me rephrase that. Well, this would be objecting to the directional drilling.

This is the only objection from anybody you have received, is that right?

A No, we have received, I believe, an additional twenty or so letters from the Rusty Sun Townhomes and their problems will be addressed at the City Council meeting in July.

Q Their concern is essentially the drilling operations and the land, is that essentially their complaint or --

A I believe it has to do with Tenneco's improvements of the land after the wells are drilled.

Q And we're just here today to look and decide on the technical aspects of the directional drilling as it's concerned with the lease operators and the surrounding leaseholders, is that correct?

A That's correct.

MR. STOGNER: I have no ques-

tions of this witness.

MIKE DECKER,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Decker, for the record would you please state your name and occupation?

A My name is Michael Kim Decker. I am a project geological engineer with Tenneco Oil Company.

Q Mr. Decker, have you testified as a geologic engineer before the Division on prior occasions?

A No, I have not.

Q Describe to the examiner when and where you obtained your degree.

A I obtained my degree from Colorado School of Mines in 1977 with a Bachelor of Science in geological engineering.

Q Have you received any other degrees since receiving your initial degree in '77?

A No, I haven't.

Q Subsequent to obtaining your degree, would you summarize for us when and where you've been em-

ployed as a geologic engineer?

A I have been employed with Tenneco since graduation.

I began my career in Lafayette, Louisiana, working as a development or production geologist four and a half years there, and was transferred to Denver office in 1981 and have been working the San Juan Basin for approximately the last two years.

Q Would you describe and summarize for us what has been your involvement with regards to this particular application before the Division today?

A Okay, my involvement has been the preparation of the exhibits and the study of the locations and the preparation for the logging duties further on down the line when we do drill the wells.

MR. KELLAHIN: We tender Mr. Decker as an expert geologic engineer.

MR. STOGNER: He is so qualified.

Q Mr. Decker, let's get into the specifics of -- let me get you another set of exhibits.

Let's get into the specifics of explaining to the examiner the various relationships between the surface location for each well and its corresponding bottom hole location, and let me start off with directing

your attention to page number 13, and we'll go through each of the four, then, and describe for him the plat and show him how the bottom hole locations are going to be displaced within the section.

So if you'll start with page 13 and describe which well this is and where the approximate bottom hole location is.

A Okay. This plat describes the surface and bottom hole location of the City of Farmington Com No. 1 Well. The open circle is the surface location with the darkened circle being the bottom hole location. The bottom hole location was picked based on two criteria. First, to meet the spacing standard requirements and second, to maximize our net of pay within our objective.

Q What is the significance of the square depicted around the solid dot?

A Okay, the square is the standard spacing unit, being 1450 and 1850 from the south and east lines. That is the drilling window.

Q The drilling window, then, will correspond to a standard bottom hole location under the rules for the Basin Dakota Gas Pool?

A That is correct.

Q And so long as the bottom hole location then is within that window it would be a standard location.

A That is correct.

Q The first well we've looked at is the Com No. 1 Well and it will have a bottom hole location in the southeast quarter.

A Correct.

Q All right, let's turn to the Com Well 1-E on page 35 and see where that bottom hole location ends up.

A Okay, that bottom hole location is in the northeast quarter and this is -- this well is the City of Farmington Com 1-E. Again the bottom hole location for this location is standard according to the Basin Dakota rules, and its location was also picked according to the two criteria mentioned earlier.

Q Okay, and again it depicts the drilling window that's consistent with a standard bottom hole location pursuant to the pool rules.

A That is correct.

Q All right, let's go to page 57, which is the City Well No. 2 and have you locate for the examiner the bottom hole location for the third well.

A Okay, the third well was the City of Farmington No. 2. This well is projected or its bottom hole location is projected to be in the southwest corner. Again the drilling window for this well is standard according to the Basin Dakota rules.

Q All right, and finally, if we go to page 78 and look at the City Well 2-E, would you describe for us the proposed bottom hole location for the fourth well?

A Once again the City of Farmington 2-E is to be drille din the northwest corner and again the drilling window is standard according to the Basin Dakota rules.

Q All right. Let me direct your attention now, Mr. Decker, to the significance of the bottom hole locations as projected in terms of the geology that you've examined and studied.

For purposes of my question I want to direct your attention to page 79, 80, and 81. When we look at those pages have you included in the exhibit book the same exhibits for each of the four wells?

A Yes, I have.

Q So if the examiner chose to simply look at one set of exhibits for an individual well, he's looking at the exhibits that would apply to that well and in most instances, particularly for the geology, he's looking at the same exhibit.

A That is correct.

Q All right. Let's go through the geology, then, in a general way that applies to each of the four wells, starting your discussion with page 79 and the net pay Isopach. Would you identify that exhibit for us?

A Okay, the exhibit on page 79 is a net pay Isopach of the Dakota B-1 Sand.

Q How was this prepared?

A This was prepared by first determining the Dakota penetrations within this map area. The logs were then evaluated within each of the penetrations to come up with the net pay values. The net pay values were then contoured according to a model of deposition.

Q Have you examined the exhibit and satisfied yourself that it is accurate and reliable?

A Yes, I have.

Q In fact have you relied on it?

A Yes, I have.

Q In looking at Section 10, first of all how do we find that section on the exhibit?

A Okay, Section 10 is the section that has the surface location and the bottom hole location of the Well 2-E.

Q Okay, it says SL --

A Correct.

Q -- circle dotted line goes to BHL that says 2-E.

A Correct.

Q All right, that area, then, in Section 10 and each of the wells are located in that same section.

A This is correct.

Q Would you describe generally what geologic conclusions you reach based upon this Isopach about the potential production in the Dakota formation and how that production ought to be developed?

A Okay. The field, based upon this Isopach and geologic interpretation of the values that we are able to extend the sand from the northwest in such a manner that we would need four wells to adequately develop this section and adequately develop the sand within the section, I should say.

Q In looking at the question of whether or not it is more effective to develop the gas reserves in the pool from wells separately located with vertical wellbores as opposed to using a drilling island and directionally drilling, how does the plan for directionally drilling compare in terms of adequately developing the reserves, compare to the option of drilling vertical wells?

A Okay, the directional drilling option is the same as if we were to have the ability to drill four single Dakota producers.

Q Let's turn to page number 80, Mr. Decker, and have you describe, first of all, this exhibit and then tell us what conclusions you reach about the exhibit.

A This exhibit on page 80 is a stratigraphic cross section of the Dakota formation. The

datum for this cross section is the top of the Graneros. This cross section also shows the top of the Dakota A and the top of the Dakota B.

I would like to show through this cross section that we do have sand present across the area within the Dakota B member, and that this sand is capable of producing as evident by the perforations marked with the small circles within the cross section.

Q If you'll turn to page 81, now, Mr. Decker, would you identify that exhibit for us?

A On page 81 we have a structural contour map on the base of the Greenhorn limestone, which is immediately above the Dakota formation, and this is placed here strictly for completeness sake, so that one may see what the structure looks like in the area.

We have a northeast dip, strike being northwest/southeast.

Q Do you see any structural features or other geologic features which cause you as a geologic engineer to recommend that directional drilling not take place?

A No, I do not.

Q There is no structural feature or other geologic feature that would make directional drilling an unreasonable risk to undertake for developing the reserves

that are indicated in the pool.

A No, there is not.

Q And were the geologic exhibits that are included in the package of exhibits prepared by you or compiled under your direction and supervision?

A They were.

MR. KELLAHIN: That concludes my examination of Mr. Decker.

MR. STOGNER: Thank you, Mr. Kellahin.

CROSS EXAMINATION

BY MR. STOGNER:

Q Mr. Decker, are there any potential producing zones above the Dakota in this area?

A The Pictured Cliffs, I believe, may be capable of producing within this area. We're outside the producing limits for the Mesaverde formation.

Q Is it Tenneco's plan to test the Pictured Cliffs or any other formation?

A Not at this time.

Q Not at this time. Which one of these wells will be drilled first?

A At this time the City of Farmington Com No. 1 is the first well to be drilled.

Q Okay, and after that well is down to TD, what tests will be run or what is Tenneco's plan of action to take on testing that well? Do they plan to test that well before they proceed on the other one?

A Do you mean to complete it and test it?

Q Complete and test it?

A No, sir, we will leave the well cased off and then proceed to drill the second well.

Q Okay, the second one being the No. 1-E?

A No, it will be the No. 2.

Q The No. 2.

A Uh-huh.

Q And then what will be the third well?

A Right now it's conjecture. We could go ahead and do either the 1-E or the 2-E. There are no specific plans at this time.

Q Will there be tests done on the No. 1 and No. 2 before it's okayed to drill the No. 1-E and 2-E?

A To the best of my knowledge, yes.

Q Okay, what kind of tests will be performed?

A We will go ahead and complete and production test the sands.

MR. STOGNER: Mr. Kellahin, what will your next witness, what will be his expertise?

MR. KELLAHIN: He's a drilling engineer with experience in directional drilling. He'll talk about drilling and completion.

MR. STOGNER: Okay.

MR. KELLAHIN: Deviation of the wellbore.

MR. STOGNER: Okay, I have no further questions at this time of Mr. Decker.

He may be excused.

JOHN W. OWEN,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Owen, for the record would you please state your name and occupation?

A My name is John W. Owen. I work for Tenneco Oil in Denver, Colorado, as a Senior Drilling Engineering Specialist.

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

A No, I haven't.

Q Would you describe for the examiner when

and where you obtained your degree?

A I obtained a degree in petroleum engineering from the Colorado School of Mines in 1972.

Q Subsequent to graduation, would you describe what has been your employment experience as a petroleum engineer?

A I originally went to work for Exeter Drilling, Denver, Colorado, from 1972 to 1975, as a field engineer.

From 1975 to the present I've been employed by Tenneco Oil Company in various drilling capacities throughout the Rocky Mountain region.

Q Would you describe generally what it is that you do for Tenneco as a drilling engineer?

A I participate in the planning of the wells. I've also had experience in on-site wellbore well experience.

Q Would you estimate for us the number of wells that you have been involved in during the planning or operation stages?

A Several hundred throughout the Rocky Mountain area.

Q When it comes to Dakota gas wells, can you describe for us or estimate the number of Dakota gas wells that you've been involved in, either in the planning

or the operation?

A In excess of fifty.

Q When we talk about directionally drilling gas wells, can you identify for us approximately how many of those type wells you have been involved in either planning or operation?

A Twelve.

Q Have you been involved in the planning and the operation of these four wells?

A Yes, I have.

Q And pursuant to that employment have you made a study of and prepared certain exhibits for presentation to the Commission?

A Yes, I have.

MR. KELLAHIN: We tender Mr. Owen as an expert drilling engineer.

MR. STOGNER: Mr. Owen, you said you were involved in twelve other directional drilling projects of Tenneco's.

A Yes.

MR. STOGNER: Were they in the Rocky Mountain area?

A Yes, sir, in North Dakota and Wyoming.

MR. STOGNER: Were those wells in North Dakota and Wyoming, were they subsequently deeper

than what we're talking about here today?

A The one in Wyoming was approximately the same depth. The ones in North Dakota were deeper.

MR. STOGNER: Substantially, I guess.

A Yes, they were 11-to-13,000.

MR. STOGNER: Yes, Mr. Owen is so qualified.

Q Mr. Owen, to further brief the examiner on what we're going to propose on behalf of Tenneco, let me direct your attention to page 32. This is the drilling pad layout for the City Well No. 1. Let me ask you this as a drilling engineer, Mr. Owen. Is the 4-acre plus tract of sufficient size that you as a drilling engineer can conduct operations of the drilling and completion of the four deviated wells using this area for the surface of that operation?

A Yes, it is.

Q And in each of the subsequent wells you have a similar plat showing the approximate surface location of the surface facilities for each of the wells.

A Yes, there is.

Q And they move around within the 4-acre tract.

A Yes, they do.

Q All right, let's go to page 26.

MR. STOGNER: 26?

MR. KELLAHIN: 26.

Q And use the drilling and casing and cementing program that's outlined on page 26 and let me ask you, sir, does that represent and is it typical of the drilling, casing, and cementing programs that you've recommended for all four wells?

A Yes, it is.

Q There'll be some minor changes with regards to the footages and the angles, and what not, but the basic concept is the same.

A Yes, it is.

Q Without reading the exhibit, would you just summarize and describe for the examiner, first of all, the drilling technique , casing and cementing program, that has been recommended for these wells?

A Yes, sir. The first order of business will be to move in and rig up the drilling rig. This will be accomplished during daylight hours.

After rig-up we will drill the 12-1/4 inch hole to approximately 500 feet, using the native drill, gel water/mud system.

At 500 feet we will run 9-5/8ths inch surface casing and cement that casing back to surface as per

the requirements of the Oil and Gas Commission.

Q When we look at the casing in terms of its size and strength and compare that size and strength with regards to directionally drilling operations, are you satisfied as an engineer that the size and strength of the casing program anticipated for these four wells is adequate to allow directional drilling to take place?

A Yes, I am.

Q With regards to the cementing program, would you outline what that program is in terms of directional drilling and how, if at all, that would differ from the cementing program in a well that's drilled vertically?

A Yes. In this particular case if you're referring to the cementing of the production string through the deviated hole?

Q Yes, sir.

A We will do a 3-stage cement job on these particular wells. The stage tools will be located at approximately 4900 feet and 2000 feet. The purpose of this is as an additional safety requirement that Tenneco has imposed upon itself to sufficiently cement the production string from TD up to surface casing.

Q What assurances will you undertake to satisfy yourself that the cement has properly bonded and that you have a continuous string of cement from the surface

to the perforations?

A We will visually monitor the cement job and if there seems ot be anything that doesn't look right, we will either run temperature surveys or bond logs.

Q With regards to the actual drilling itself, are these wells to be drilled with mud or are they gas drilled?

A These wells will be drilled with mud.

Q And what difference does that make in terms of the drilling technique?

A The typical, more typical Basin Dakota well would be drilled with gas. These wells we will drill with mud since we will not be able to flare the drilled gas within the city limits. We've using the mud, also, to adequately control the pressures that may be encountered.

Q In your opinion does the method of drilling, casing, cementing, and completing of the directional drills either meet or exceed the requirements of the Oil Conservation Division?

A Yes, they do.

Q And do they meet or exceed the standards applied by your profession for the drilling and completion of directionally drilled wells?

A Yes, they do.

Q Has Tenneco had other experience in

drilling Dakota gas wells within the City of Farmington pursuant to the current City of Farmington rules and regulations for that purpose?

A Yes, we have.

Q Could you approximate for the examiner where the nearest well is that Tenneco has drilled in the City of Farmington to this site?

A I believe the nearest well is in Section 11 of the same township and range. It is the Irvin Com 1-E and that was drilled approximately a year and a half ago.

Q All right, we can find that on page 36 using Mr. Decker's Isopach. It's over in Section 11 and it's the 1-E that shows 24 feet of net sand?

A Yes, 36. Yes.

Q All right. Can you characterize the degree of difficulty that Tenneco is undertaking with regards to this type of directional drilling as it might compare to other types of directional drilling?

The point of my question is in directional drilling terms is this a typical, standard directional drilling process or are we out on the fringes of technology and experience with this project?

A No, this would be a conventional directional drilling project.

Q Let's look at page 25 and talk about

whether or not in your opinion there is the likelihood of a mechanical risk or other risks involved beyond the normal risk of doing this type of operation.

A There would be no difference between a straight up hole and a directional hole. We will encounter the same formations. We anticipate normal formation pressures with the possible exception of the Gallup, which may be under-pressured; however, when we did drill the Irvin Com 1-E in Section 11, there were no lost circulation encountered, nor were there any abnormal pressures encountered.

Q Is the method and design you have used for these directional drilled wells one that is adequate to meet the pressures that are anticipated to be encountered as depicted on page 25?

A Yes, they are.

Q Let's go now, sir, to the actual mechanics of the directional drilling and have you discuss for us the horizontal and vertical plans for the directional drilling and directing your attention now to page 17, does this represent work that you've done for each of the four wells?

A Yes, it does.

Q And when we look at each of these types of exhibits for each of the four wells, you've done similar work except the angle is going to be slightly different.

A The angles would be different. The

course from surface hole -- from surface to bottom hole location would be different, and the kickoff point may vary.

Q Okay, with regards to the range within those parameters, are all of the ranges within those standard, acceptable ranges for conventional directional drilling?

A Yes, they are.

Q And are the drilling tools that you propose to use conventional tools for this purpose?

A Yes, they are.

Q Let's have you describe for us page 17 so that we know what your proposal is with regards to the City Com Well No. 1.

A Okay. This is the directional proposal for the City of Farmington Com No. 1. On the righthand side of the page is a horizontal or top view of the proposed course of the well. This well will follow from surface at a south 24 degrees west direction to bottom hole location.

The lefthand side of the page is the vertical plan or cross section. This shows kickoff point at approximately 3275, building angle at a rate of 2 degrees per 100 until we achieve an 11 degree angle. We'll then hold 11 degree angle to bottom hole location.

The displacement of this well will be approximately 449 feet at the top of the Dakota from surface.

Q Let's turn to page 18 and have you describe that exhibit for us.

A This exhibit is a summary sheet of the data used to prepare the previous graph.

Q Okay, if we turn to page 19, would you describe that exhibit for us?

A This is a generalized wellbore schematic of the City of Farmington Com No. 1.

Q Mr. Decker has previously identified for us exhibits that show the bottom hole window for each of the wells.

In your opinion as a drilling engineer is it reasonable to anticipate that Tenneco can stay within the drilling window for each of the four wells?

A Yes, it is.

Q Let's turn now to the 1-E Well and page 39, and have you describe the directional drilling for that well.

A This is the directional proposal for the City of Farmington Com 1-E; surface location at 2203 from the south, 1653 from the east. The bottom hole is 1650 from the north, 1650 from the east.

Again we have the horizontal plan on the righthand side going from surface location up to the bottom hole location.

The lefthand side is the vertical plan showing kickoff point at approximately 1000 feet, building angle at 2 degrees per 100 until we achieve a 22 degree angle. We hold 22 degrees until we intersect bottom hole location at a displacement of approximately 1427 feet from surface.

Q And again following that exhibit is the tabulation of information used to make the plat?

A Yes, it is.

Q And on page 41 is the wellbore schematic for that well.

A Yes, it is.

Q All right, let's turn to the third well, which is the City Well No. 2, directing your attention to page 61, and have you describe for us now the directional drilling for this well.

A Okay. This is the proposal for the City of Farmington No. 2. We have a surface location at 2159 from the south, 1712 from the east; bottom hole location 1650 south, 1650 from the west line.

You have a horizontal plan on the righthand side. On the lefthand side is the vertical plan; kickoff point at approximately 750 feet, building angle at 2 degrees per 100 until we achieve a 24 degree angle.

We will hold 24 degrees until we inter

sect the bottom hole location at approximately 1984 feet displacement.

Q Following that page on 62 is the tabulation of information for the prior exhibit?

A Yes, it is.

Q And then 63 is the wellbore schematic.

A That's correct.

Q All right, and lastly, the number four well, if you'll turn to page 82 and describe for us the directional drilling for the City Well 2-E.

A Surface location will be at 2246 from the south line, 1712 from the east line; bottom hole location to be 1650 from the north, 1650 from the west.

You have a horizontal plan on the right-hand side and the vertical plan on the lefthand side of the page; kickoff point will be approximately 750 feet; true vertical depth, we will build angle at 2 degrees per 100 until we reach 28 degrees; hold 28 degrees till we intercept bottom hole location at approximately 2365 feet total displacement.

Q And again on page 83 a tabulation of information for the prior exhibit and 84 is the wellbore schematic.

A Yes, it is.

Q Let me ask you about the drilling order.

Mr. Decker discussed his understanding of the drilling order. Let me ask you, sir, what your understanding of the drilling order is in terms of whether or not the four wells can be drilled and completed in a particular order within the surface acrea, where that activity can be done reasonably safely.

A Okay. We will drill the Com 1 Well first. We will leave that. We will not enter that or complete the well until we have drilled the No. 2 Well.

Q What's the reason for that, Mr. Owen?

A Just as a safety precaution. If you did have a producable, live well with the wellhead sticking up there, you know, you would have a chance of running over it with a truck or something rigging up for the second well.

We would prefer to leave both wellbores until both have been drilled encased and then go back and complete both wells.

Q Depending upon the success of those two wells in terms of producing economic gas reserves from the Dakota, what then would be the plan for the two additional wells?

A It's my understanding that we would set some sort of a plug in the tubing or casing to isolate the gas in the --

Q In the two existing wells?

A -- wells, and go through the same procedure with the second two wells, drill both and then complete both.

Q What advantage does that have in terms of safety?

A Again you will have, if you temporarily plug the two producing wells, you eliminate the safety problem there with an accident and you would have the same with completing the two wells.

MR. KELLAHIN: That concludes my examination of Mr. Owen, Mr. Examiner.

At this time we move the introduction of Tenneco Exhibit Number One.

MR. STOGNER: Exhibit Number One will be admitted in its entirety.

CROSS EXAMINATION

BY MR. STOGNER:

Q Mr. Owen, let's talk about the build-up --

A Okay.

Q -- of these wells. How will that be accomplished? What tool will be used?

A To build angle?

Q Yes, sir.

A We will use a mud motor with a bent sub.

Q And in that particular portion what did you say the mud weight would be?

A I believe it will be around 9 pound mud per gallon, or pound per gallon of mud.

Q Okay. Okay, I was looking at the top of the estimated formation tops here on page 25 as opposed to your drilling. You will already have been through the Pictured Cliff and the Fruitland formation at this time and you will be essentially within the Menefee, between the -- in the Menefee, is that correct, before you start building angle?

A Yes, that's correct.

Q Okay. What kind of material is the Menefee that kickoff will be in?

A I believe the Menefee is a member of the Mesaverde formation. It is a sandstone.

Q Do you all foresee this to be a nonproductive zone or is there any chance of production?

A I believe the Mesaverde is nonproductive in the area.

Q When you start your hole section on the well, what type of mud will be then used?

A It should be about the same.

Q And so 9-pound mud will be used through-

out the TD of the well at that time.

A Yes.

Q On your blowout preventers that are utilized you show that a rotating head will be utilized.

A Yes.

Q Now will that be used throughout the drilling of the well or when will that be put on?

A We will nipple that up after -- when we nipple up the rest of the blowout preventers on top of surface casing. That's just a safety precaution.

Q And that rotating head will be on the assembly at all times?

A Yes, it will. Normally you will have the, you know, the rotating head itself installed, pressure tested, and the rubber made up on a stand or joint of drill pipe so if an emergency were to occur you could stab it.

Q Will this rotating head to able to accommodate drill collars or will that need to be removed when coming out of the hole with your drill collars?

A I believe it will accommodate drill collars.

Q Okay, will there be a high drill type blowout preventer?

A No, there will not. It's a double ram preventer with tight and blind rams.

Q Is this configuration pretty standard throughout the Permian Basin, a double ram with a rotating head?

A Yes, San Juan Basin, this is a typical hookup.

Q Okay. Now, on page 31, I'll allude to it, you show a blooie line. That's B-L-O-O-I-E.

A Yes.

Q A blooie line, where will that be directed off to? Do you show that on your location configuration?

A I don't know that it is.

MR. KELLAHIN: 32 would have a surface plat.

Q Yeah, let's refer to page 32 there.

A Okay.

Q Is your blooie line shown here?

A No, it is not shown.

Q Where would that be directed off to?

A From where it says drilling unit, basically from the southeast corner of it out in a easterly direction.

Q Due east?

A Well, more or less.

Q Okay, now if I refer back to page 12, put

the blooie line pointing back towards the east, what is -- have you -- have you inspected the surface?

A I have not physically inspected it.

MR. STOGNER: Mr. Kellahin, has any of your previous witnesses looked at the surface out there?

MR. KELLAHIN: Mr. Decker, have you been on the surface?

MR. DECKER: No, I haven't.

MR. KELLAHIN: Mr. Heringer, have you been on the surface?

MR. HERINGER: Yes.

MR. KELLAHIN: Mr. Stogner, Mr. Heringer is the only one that's been on the surface.

MR. STOGNER: Okay, I'll direct some questions to Mr. Heringer later.

Q When is a blooie line utilized and what's its function?

A Normally it's used during the gas -- on a gas drilled well.

Q And why is a blooie line being installed here?

A We are -- that blooie line is the vent line for the rotating head.

Q And when is the blooie line utilized in

this kind of configuration?

A Only under extreme emergency conditions.

Q Okay. What would be one of these extreme emergency conditions?

A I would -- an unexpected blowout.

Q A kick?

A Yes, sir. Normally a kick would be handled through your regular blowout preventers and choke manifold.

Q Let's go with the blowout here, blowout situation.

How far could a flame foreseeably -- could you foresee a flame shooting out of this, the end of this blooie line?

A Oh, 20 feet.

Q And is this directed into a pit?

A Yes, it would be.

Q Okay, and this pit would probably be --

A Banked.

Q -- scooped out where it would divert any -- any --

A Yes, sir.

Q Has there been a contingency plan for evacuation in case a blowout does occur?

A I believe there has been for the city.

Q Okay, what does Tenneco's contingency plan consist of whenever -- before a well is commenced to drill? Is there a meeting between Tenneco and its drilling contractor and some of the service companies involved?

A Yes, we do. That's called a pre-spud meeting. We typically have that, as you say, with the drilling contractors to discuss those. I believe in this case that the City of Farmington, the fire and police departments will be notified and the fire department will have the copy of the plan in their possession.

Q I notice in here that you show a potential lost circulation zone in the Gallup formation.

A Yes.

Q Would you please kind of elaborate on what will be done as the Gallup is being drilled through this lost circulation zone?

A Okay, we will drill through. We will visually monitor the mud returns at the flow line. If we do detect some loss of circulation we will pull up and mix lost circulation material, pump it down the hole in an effort to cure the lost circulation.

Q Let's go back to the directional portion of this. After you make your initial curvature --

A Yes.

Q -- a multi-shot will then be run, is that

correct?

A We will run the multi-shot prior to kick-off point.

Q Okay.

A That will give us, you know, and exact bottom hole location at kickoff point and as we are building and holding angle we will be taking surveys to monitor the inclination course of the wellbore and making any changes that we deem necessary.

Q Will a final multi-shot be done after TD?

A Yes, it will be.

MR. STOGNER: I have no further questions of Mr. Owen.

Are there any further questions of Mr. Owen?

Can we recall Mr. Heringer?

MR. KELLAHIN: Sure. Kevin, you want to come back up here?

KEVIN HERINGER,

being recalled and remaining under oath, testified as follows, to-wit:

RECROSS EXAMINATION

BY MR. STOGNER:

Q Just so I can make it clear in my mind, let's refer to the map on page 12.

Where is the airport, so I can make it straight in my mind where I'm at here?

A To be honest, I don't know where the Farmington airport is.

MR. KELLAHIN: Can you describe for him what end of town you're in?

A This would be located in the -- I'm sorry, can I backtrack?

Q Sure.

A I misunderstood your question. I thought you asked where is the airport located?

Q Yes. Was -- is this around the airport area?

A No, it's not.

Q It's not? I was thinking it was, so if you could kind of elaborate where it is. That's the reason I asked that, that silly question.

A This will be in the middle of Farmington. If you will look at that map you can tell that there are residential areas; there are open lands to the northeast, to the east City of Farmington.

To best describe it would be in the middle of town.

MR. KELLAHIN: Have you physically been there, Mr. Heringer?

A Yes, I have.

MR. KELLAHIN: Can you describe -- I think Mr. Stogner's been to Farmington also. Can you describe how you get to this property so he can have some reference to where it is in town?

A We have the street maps. Back to I am familiar with this property --

MR. KELLAHIN: Do you have a City of Farmington map with you?

A I have a larger map of Section 10; not of the City of Farmington -- I can provide you with one that will show --

MR. KELLAHIN: Look at your City of Farmington map to show you where it is.

MR. STOGNER: Okay, I'm just kind of placing myself here. I'm not familiar with Navajo Street or Vine Street.

Is it north from downtown?

A I believe it's east from downtown.

MR. OWEN: East from downtown.

Q East from downtown, okay.

A I'm not real familiar with north, east, and west in Farmington.

Q All right, let's go back to --

A I'm familiar with this individual property and if you want to go there with me I'll --

Q Sure, okay, let's go.

Let's refer back to page 12. I'm interested in what lies immediately off this property to the northeast and to the east.

A To the northeast would be open land. You come down to the northern part of the northeast southeast, right, I guess directionally east of the land is a baseball diamond. Directionally south are the Rusty Sun Townhomes.

Q Okay, hold it, where is the baseball diamond?

A To the right in the corner.

Q Is that that big baseball diamond where they play the big -- okay, now I know where you're at.

Okay, that's the big Connie Mack Field, right? Now I know where we're at now. Okay.

So there's a hotdog stand and grandstand over there, right?

A Yes, that's correct.

Q Okay, so on all these wells the blooie line can foreseeably be laid out where it's in that direc-

tion or those directions to where if it had to be utilized it would be pointing toward an open field or an unused portion of the city?

A Yes, as far as I know.

Q Okay. That's all the questions I have. Mr. Heringer, you may step down.

Mr. Kellahin, do you have anything further in this case?

MR. KELLAHIN: No, sir.

MR. STOGNER: Does anybody have anything further in Case Number 8915?

Before I go off the record, I'd like to state that I did receive a telegram from Mr. Charles Pearson requesting that this -- they ask for postponement of this application.

After hearing the testimony today and speaking with Mr. Pearson, I believe the argument is essentially with the City of Farmington, Tenneco, and themselves, and is beyond the jurisdiction of this particular agency at this time.

They also state in here that they do not understand the hazards and dangers of this type of drilling and need to find out a little bit more information and today would have been a good time for them to have learned that if they had been here, and seeing that they

were notified on June 4th, I believe Tenneco give them adequate time to respond.

So I'm going to deny the request and take Case Number 8915 under advisement.

(Hearing concluded.)

C E R T I F I C A T E

I, SALLY W. BOYD, C.S.R., DO HEREBY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division (Commission) 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 CSR

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 8915 heard by me on 25 June 1986.

Michael E. Stogner, Examiner
Oil Conservation Division

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

12 June 1986

EXAMINER HEARING

IN THE MATTER OF:

The disposition of certain cases called on Docket No. 18-86 for which no testimony was presented.

CASE 8891, 8892, 8915, 8870, 8874.

Transcript in Case 8891

BEFORE: David R. Catanach, Examiner

TRANSCRIPT OF HEARING

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