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

9 May 1984

EXAMINER HEARING

IN THE MATTER OF:

Application of Robert N. Enfield for an unorthodox gas well location, Eddy County, New Mexico. CASE 8177

BEFORE: Richard L. Stamets, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

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I N D E X

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E X H I B I T S

MR. STAMETS: We'll call next Case 8177.

MR. PEARCE: That case is on the application of Robert N. Enfield for an unorthodox gas well location, Eddy County, New Mexico.

MR. COFFIELD: My name is Conrad Coffield and I'm with the Hinkle Law Firm in Midland, Texas, appearing on behalf of the applicant.

I have three witnesses to be sworn.

MR. PEARCE: Are there other appearances in this matter?

MR. CARR: May it please the Examiner, my name is William F. Carr with Campbell, Byrd and Black, P. A., of Santa Fe, appearing on behalf of Marathon Oil Company.

I have one witness.

MR. PEARCE: Other takers?

(Witnesses sworn.)

ROBERT N. ENFIELD,

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

DIRECT EXAMINATION

BY MR. COFFIELD:

Q Mr. Enfield, for the record would you please state your name and address?

A My name is Robert N. Enfield, Santa Fe, New Mexico.

Q Are you the applicant in this case?

A Yes, I am.

Q And are you the proposed operator of the well which is the subject of this application?

A Yes, I am.

Q Are you familiar with operational matters in this area generally and in Section 18, Township 21 South, Range 23 East, specifically?

A Yes, sir, I operate wells in Sections 18, 17 and I have drilled dry holes in others around the field.

Q Have you previously testified before the Division?

A Yes, I have.

Q And were your qualifications made a matter of record and accepted by the Division?

A Yes, they have.

MR. COFFIELD: Mr. Examiner, I tender Mr. Enfield to testify on his own behalf.

MR. STAMETS: He is considered qualified.

Q Mr. Enfield, for the record would you

please state briefly what it is you seek in connection with the application in this case?

A I seek to drill an unorthodox location in Section 18, 21 South, Range 23 East, to the Indian Basin Upper Penn Reservoir.

The location will be 660 from the south and 330 from the east line of said Section 18.

Q Do you propose to dedicate the entire section to this well?

A Yes. It's presently dedicated to the No. 1 Bunnel.

Q Mr. Enfield, how many acres are there in Section 18?

A 574.04.

Q Would you please refer to what we've marked previously as Exhibit Two and describe the features of that exhibit to the Examiner?

A This is a land plat showing the location of the No. 1 Bunnel 1650 from the south and east of Section 18.

Shown in red is the proposed location for the No. 2 Bunnel.

The acreage colored in yellow offsetting is acreage under which I own interests and all -- and other parties own interest.

Q Can you tell the Examiner, please, Mr. Enfield, what is the ownership of offsetting acreage, speci-

fically, of course, with reference to the acreage toward which you are moving in this unorthodox location?

A I am the operator and owner of the acreage in Section 17 and in the north half of 20.

The south half of 20 is owned by Marathon and Southern Petroleum.

The ownership is common in 18, 17, and 20, the part that's marked in yellow. The percentage differ but the ownership is the same parties, with the exception of Superior, who does not own in 17 and 20 but does own in Section 18.

Q And the ownership is Section 19, did you cover that?

A In Section 19 the operator's El Paso, which also owns in 17 and 20 and 18, and L. R. Prince, who also owns in 17, 18, and 20.

Q What about the royalty ownership in the sections involved here?

A The royalty is common. It is all Federal royalty.

Q As the operator of the No. 1 Bunnel Well located in Section 18, Mr. Enfield, would you please review the history of that well and give your experience with it?

A The well was drilled approximately nineteen years ago. As you'll see by later exhibits, there is a dolomite lime facies change. This well was located in the lime.

Recently we've been experiencing a decline in production. Commencing in December our production was a million four, approximately, cubic feet for the whole month. January, approximately 350 Mcf. February, zero. March, a little more than two million, which we feel was a marginal situation and indicates we need to do something.

Q Have you attempted any remedial work recently on this particular well?

A We have looked at the remedial work in there and as the -- as my engineers will testify, we do not think it is economically feasible and probably would not be totally successful.

Q Is it your opinion, then, the remedial work is not a viable alternative to attempting to secure additional production from this particular section?

A Yes, that's true.

Q Is the well for which you're seeking approval in this case, then, Mr. Enfield, in effect a substitute well for your No. 1 Bunnel?

A Yes, it would be. Ultimately we would plug the No. 1.

MR. COFFIELD: Mr. Examiner, in connection with some upcoming testimony, I would respectfully request administrative notice be taken of prior Case Number 6845 and Order No. R-6310, which case involved an application by Marathon Oil Company for an unorthodox well location and which was heard by the Examiner March 26th, 1980.

MR. STAMETS: We will so take administrative notice.

Q Mr. Enfield, in connection with the case I just mentioned, would you refer now to what we've marked as Exhibit One in this case and explain that exhibit as far as your concerns are?

A This is a structural map identical as submitted by Marathon in the Case Number 6845. We essentially agree with the structural map. We have no difficulty with it.

One additional thing, two additional things have been added. We put a limited line in red showing the porosity limit, which was not part of the original case. We have carried the limestone dolomite contact point through my well, which in the original map I think it was stopped up in 18. I don't remember. I mean up in Section 8, rather.

Other than that the map is identical other than the scale, instead of being 1-to-4 is 1-to-3.

Q On this map where is the Marathon Well located which was the subject of the order I just mentioned?

A It was located in Section 30, 800 feet from the north line and 200 feet from the west -- east line, rather, of Section 30, 21, 23.

MR. STAMETS: What was the north line?

A 800.

MR. STAMETS: Thank you.

A That's the best of my recollection. I'm sure that's right.

Q Did you have any other comments with respect to the features on this particular matter, Mr. Enfield?

A Other than the structure map in the Upper Cisco Canyon and showing the fault line through there, which we agreed to at that time and agree to now.

Q In your opinion is the granting of your application in the interest of conservation, prevention of waste and protection of correlative rights?

A Yes.

Q Was Exhibit, what we've marked Exhibit Number Two, Mr. Enfield, prepared by you or under your supervision?

A Yes, it was.

MR. COFFIELD: I'd move the admission now of Exhibit Number Two, Mr. Examiner.

MR. STAMETS: Exhibit Two will be admitted.

MR. COFFIELD: I have no other questions of Mr. Enfield on direct Examination.

MR. STAMETS: Are there questions of Mr. Enfield?

Mr. Carr.

CROSS EXAMINATION

BY MR. CARR:

Q Mr. Enfield, you stated that the present well in Section 18 was drilled in 1964, I believe?

A '65, I believe it was.

Q What has it produced to date?

A Just a moment, I can give it to you. 4.75 Bcf. That is to 1-1 -- through December '83.

Q And is it at a standard location?

A Yes, it is.

Q And what is that footage location?

A 1650 from the south and east of Section 18.

Q Is all of Section 18 dedicated --

A Yes, it is.

Q -- to that well?

A The Upper Penn is dedicated --

Q Right.

A -- under a communitization agreement.

Q And so your proposed location is to be between that standard location and the offsetting owners to the south and the east.

A My -- yes, in between my wells to the south and east.

Q Now, you have indicated on your Exhibit Number One a 2 percent porosity limit. Did you place that

there or did another witness?

A No, my geologist.

Q And as to -- there's a dashed line on this that shows the dolomite and limestone. Why is that a significant limit?

A Normally the wells in the limestone have not produced this well.

Q And do they produce better on the south side of the line or on the north side of this line?

A On the south side of the line.

Q And that's where the dolomite would be encountered?

A Hopefully.

Q And that is the -- and you are actually locating the --

A To the east side, southeast, actually.

Q To the southeast. You're actually locating to the southeast and not to the north and west of a line, hoping to encounter the dolomite, is that correct?

A Yes. I am attempting to have a facies change with a better production capacity.

Q Does Marathon own any interest in Section 18?

A None that I know of.

Q Do they own, to your knowledge, any interest in Section 19?

A I believe, I think they own the southeast

quarter.

Q Do you operate the well in Section 20?

A Yes, sir.

Q And has the entire section been dedicated to that well?

A Yes, sir.

Q Do you know what interest Marathon owns in that?

A 42.5 percent.

Q And you operate that section for them?

A Yes, sir.

Q And others.

A And others.

Q Who are the other interest owners in that section?

A In all three sections, 17 and 18, it's Enfield, El Paso Natural Gas, Cities Service, Superior, Nearburg and Ingram, and Bobby French and Son, and Monsanto.

Q Do you believe that a well at the proposed location would drain reserves north and west of that dashed line which is indicated as the dolomite-limestone boundary?

A Yes, but I'm not a competent -- I'm not an expert in geology.

I do feel we would lose gas if we were not allowed to prove our position.

Q Now the well that you have, the existing

well, you indicated is now in a marginal status.

A Yes, I feel that way.

Q And it is your --

A The direction indicates that.

Q And it is your intention to plug and abandon that well.

A Ultimately, but not until we drill this well and complete it.

Q But you would not be simultaneously dedicating these two wells.

A No, I would not.

Under the Federal regulations I would have to keep that well productive until I secured production on this or you risk a chance of lease cancellation.

Q And then at that time you don't plan to simultaneously produce the two wells.

A No, no, no. I would plug the No. 1 and simply produce the No. 2.

Q And the existing well can currently produce the reserves surrounding that wellbore?

A What?

Q The existing well has apparently produced the reserves surrounding --

A Yes, it did.

Q -- that wellbore.

A That's the only well on the half section.

Q And workover is not warranted.

A We do not feel it would be successful.

Q Did you consider locating a well north and west of the existing well?

A Well, I thought about it.

Q Did you go much beyond thinking about it?

A Well, I learned from Marathon in Section 30 that it would probably be better to go to the east.

Q And to try and encounter more of the dolomite?

A Correct.

Q Did you oppose Marathon in their case in --

A Yes, I did.

Q -- Section 30?

A I'm a slow learner.

Q Was a penalty imposed on the production from that well?

A Yes, it was.

Q Based on its location.

A Based on its location.

MR. CARR: I have no further questions of Mr. Enfield.

A Actually, let me restate that. I believe the penalty was based on the proposed acreage that would be drained, not based on the location specifically, except it's an unorthodox location.

Q Okay.

A But my reading of that case was that there's so much acreage that's productive and that they were allowed an acreage factor over 640 to reduce the allowable.

MR. CARR: I have nothing further.

MR. STAMETS: Any other questions of the witness?

MR. COFFIELD: Let me -- one -- one point, please, Mr. Enfield.

REDIRECT EXAMINATION

BY MR. COFFIELD:

Q In connection with the possible location of a well to the north and the west of the existing Bunnel, would it not also be accurate to say you want to stay as far away from the recognized fault line represented on that -- in that section, as well?

A Correct. It's very difficult to know precisely where a fault is.

MR. CARR: One final other question.

MR. STAMETS: Mr. Carr.

RECROSS EXAMINATION

BY MR. CARR:

Q You wouldn't anticipate any productive acreage on the west side of that fault, would you?

A No.

Q That would contribute?

A No, none whatsoever.

MR. STAMETS: If there are no further questions, the witness may be excused.

MR. COFFIELD: Call next Mr. Edsel Neff.

EDSEL NEFF,

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

DIRECT EXAMINATION

BY MR. COFFIELD:

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

A My name is Edsel Neff. I live in Roswell, New Mexico, and I am a consulting geologist.

Q What relationship do you have with the applicant in this case?

A Consulting geologist.

Q Have you previously testified before the Division as a geologist?

A No, I haven't.

Q And would you very briefly give a resume of your educational background and work experience in geology?

A Graduated from New Mexico State with a Bachelor of geological sciences in 1980, whereupon I went to Hobbs, New Mexico, where I was employed as an engineer for Dowell.

In 1981 I moved back to Roswell, New Mexico, where I went to work for David Petroleum as an exploration geologist, consulting geologist, and I'm presently employed by them.

My work experience includes regional studies in the Abo and the Northwest Shelf, the Bough formation, the San Andres formation in the Tatum Basin, Delaware Mountain Group, Morrow Group, and -- excuse me, Morrow formation in the Delaware Basin, and regional Strawn studies and the San Simon Syncline.

Q Do you belong to any professional organizations?

A Association -- American Associateion for Petroleum Geologists and Society for Petroleum Engineers.

Q And are you familiar with the application in this case?

A Yes, sir.

Q And are you generally familiar with the geology of this area and specifically as to such geological factors as affect this particular application?

A Yes, I am.

MR. COFFIELD: We tender Mr. Neff as an expert geological witness.

MR. STAMETS: He is considered qualified.

Q Mr. Neff, would you please refer to what we've marked there as Exhibit One and discuss that exhibit from a geological standpoint?

A Okay, what everybody has here, this is a structure map. It's a structure map of the Indian Basin Cisco Reef.

As you can see, the contour interval is 100 feet.

This heavy dashed line on the left is a fault. As you can see, it separates production on the east side from nonproduction on the west. The dashed line in red in the north part of your map is a limit of 2 percent porosity, or it's essentially a porosity cutoff of acres that could be productive from nonproductive. That nonproductive, I'm meaning everything north of the dashed red line; acres that could be productive, everything south.

The northeast, this northeast/southwest dashed line here is a limestone dolomite facies or reef/nonreef, the reef being to the south of the dashed line and dolomite nonreef, to the north no limestone.

As you can see, there are numerous wells here in this dolomite section or reef. Each of these wells has penetrated the Cisco and are Cisco pays.

Section 18, the Bunnel Federal, 1650 from the south and east, this well has no dolomite present. It's

produced approximately 4.8 billion cubic foot of gas; therefore it appears to be close to the limestone dolomite facies.

Our proposed location in the southeast corner of Section 18, 660 from the south and 330 from the east, is in a dolomite facies or reef section, which means it has a greater chance of having higher porosities, permeabilities, and it's also going toward a thicker dolomite section and better production.

For example, the well in 17, West Indian Basin Unit, has 127 foot of dolomite and through 1982 produced 23.5 billion cubic feet of gas.

The well in Section 20 has has 111 foot of dolomite and has produced 23 billion cubic feet of gas through 1982.

Q Do you have anything further on this? Have you formed an opinion, Mr. Neff, as to how much of the acreage within Section 18 is capable of contributing to production from a well located at the proposed location?

A 490 acres.

Q How did you reach that conclusion?

A I took everything down dip or, excuse me, on the downthrown side of the fault, and the northwest acreage between the upthrown fault and the dashed 2 percent porosity cutoff and subtracted that from the acreage section, sectional acreage, and got 490 acres.

Q Are you familiar with the allowable fac-

tor which was imposed on Marathon in the Marathon case I mentioned a few moments ago?

A Yes, I am.

Q On that basis how would an allowable factor be calculated in this instance?

A Okay, you take 400, this 490 acres, take a ratio with 490 over 640 and you get a percentage. This percentage is then calculated into the actual acreage for the section, which I think is approximately 574 acres. From there you get a percentage which then relates back to your 640 acres.

Q In this instance, as I recall during prior testimony, Mr. Neff, the actual acreage in this section is 574.09, so it's a short section to begin with, and you're saying that the calculation of the factors then should be 490 over 640 in order to accommodate not only the nonproductive acreage, admittedly, but also the short section.

A Correct.

Q Was this Exhibit Two prepared by you or -- first of all let me ask as to Exhibit Two, parts of it were not prepared by you, is it -- is that correct?

A Correct.

Q As to those parts, have you reviewed them carefully and do you believe that they represent accurately as the proper geological representation of the features there?

A Yes, I agree with the structural map.

Q As to the remaining features of the exhibit, were those inserted on the exhibit by you or under your supervision?

A Yes. I came up with the limit of 2 percent porosity which I think separates the acres, this nonproductive from productive.

Q In your opinion is the granting of this application in the interest of conservation, the prevention of waste, and the protection of correlative rights?

A Yes.

MR. COFFIELD: Mr. Examiner, I move the admission of Exhibit Two.

MR. STAMETS: Exhibit One?

MR. COFFIELD: I'm sorry, Exhibit One.

MR. STAMETS: Exhibit One will be admitted.

Are there questions of this witness?

MR. CARR: I have a few.

CROSS EXAMINATION

BY MR. CARR:

Q Mr. Neff, you -- are you the individual that placed the 2 percent porosity limitation on this map?

A Yes, I am.

Q What data were you basing that on?

A I was basing this data on an Isopach of porosity for the surrounding wells.

Q Did you construct that Isopach?

A Yes, I did.

Q And were you -- what was the data you used in constructing that Isopachous map?

A I used a 2 percent porosity cutoff from the logs available.

Q What wells did you have logs on?

A I had logs on Well 7; had logs on Well 8; 18; 17; I didn't have one on 19; 20.

MR. STAMETS: I presume there you're talking about section numbers as opposed to well --

A Yes, sir.

MR. STAMETS: -- numbers?

A Sections.

Q You had no control whatsoever, did you, to the west of the well in Section 7?

A No, I didn't.

Q Nor to the existing well that Mr. Enfield operates in Section 18?

A I did have that well.

Q But you had no information or no raw data on anything west of that in the --

A No, I didn't.

Q -- Upper Penn Pool.

A No, I didn't.

Q Did you have any information that would enable you to place this fault line where it is placed on this map?

A No.

Q So that line could be east of where it's placed, could it not?

A Could be.

Q And if it was, that would reduce the number of acres that you'd use in calculating number of productive acres under Section 18.

A That's right. I don't think anybody for sure knows exactly where the fault's at.

Q When you estimated the number of acres that would contribute production to the well at the proposed location, did you disallow any acreage that might have been drained by the existing well in that section?

A No, I didn't.

Q Now isn't it true that the real purpose in locating the well where it is located is in essence to encounter as much of the dolomite as possible?

A That's correct.

Q How many feet of dolomite were encountered in the well in Section 18?

A Zero.

Q Zero? You had zero feet of dolomite in the existing well in 18?

A Correct.

Q And you had how many feet of dolomite in the well in Section 17?

A In Section 17 I had 127 feet.

Q And then in Section 20, is that the one you had 111 feet in?

A Correct.

Q So you're really trying to move towards the dolomite?

A Correct.

Q And isn't that the portion of the formation from which you expect to actually produce the bulk of the reserves?

A Correct. That's where you're going to have higher porosities, permeabilities where it counts.

Q And you really don't expect to produce the bulk of the reserves that would be produced by the well in Section 18 north and west of the dolomite limestone cutoff as depicted on this map, do you?

And yet you believe each of those acres should be counted the same as every acre south and east of that line in setting a penalty on this well.

A Well, I think that this -- anything below this limit of 2 percent porosity could be productive.

Q But you don't know that it is.

A I don't know that it is.

Q What you're really after is dolomite.

A Correct.

Q Now you stated you were familiar with the penalty that was imposed on the Marathon Well in Section 30.

A Right.

Q Do you know how many feet of dolomite were present in that well?

A No, I don't.

Q Now when you take your 490 acres that you have estimated being productive in Section 18 and put that over the number of acres in this unit, I assume that's 574, what percentage of penalty factor did you come up with?

A Excuse me, putting the --

Q As I understood your testimony, you said you would take the 490 acres that --

A Right.

Q -- estimate to be productive and you would divide that by the number of acres in that unit.

A Right.

Q And then based on that you would have a percentage that would be the penalty on the production.

A You take the -- right, which is approximately 85 percent.

Q So you think the well should produce 85 percent of its allowable.

A Well, you've got to take -- I took -- you take 490 acres, you get a ratio of 490 over 640. Okay.

Q Did you use 640 or 574?

A 640. Now it's this ratio times the actual acres in the area and came up with approximately 76 percent of 640 acres.

Q My question is what percentage penalty should be imposed based on your recommendation on this well's production?

MR. COFFIELD: If I may interject here, Mr. Carr, I believe the resulting percentage that comes from taking 490 over 640 is approximately 76.6.

Q And are you recommending that that be the penalty?

A Yes.

MR. COFFIELD: Which -- this takes into consideration both the short section aspect as well as the limits of the pool.

A Excuse me, the difference --

MR. COFFIELD: Allowable factor is what I'm saying, allowable factor.

Q The allowable factor would be 76.4 percent of the production.

MR. COFFIELD: That's right, that's correct.

MR. CARR: We thought it sounded better the other way.

Q Your testimony is, then, that a penalty of what, 23.6 percent should be imposed on the production from the well.

A Correct.

Q And conversely 76.4 percent is -- of its allowable is what that well should produce.

A Correct.

Q Do you believe that 76.4 percent of the reserves produced by that well will come from Section 18?

A Yes.

Q Do you believe that that well will drain, of the reserves that it drains, 76 percent of those will be reserves that presently are under Section 18.

A Yes.

MR. CARR: I have no other questions of Mr. Neff.

MR. STAMETS: Any other questions of this witness?

MR. COFFIELD: Yes, sir.

CROSS EXAMINATION

BY MR. COFFIELD:

Q Mr. Neff, in connection with the location of the fault to the west, Mr. Carr asked you if that fault could not as easily be located east of where it's shown on that particular plat.

Could it likewise just as easily be further to the west?

A Correct. There's no -- I doubt if anybody knows exactly where it's located.

Q In connection, also, then, with the question of production from Section 18, you have stated that the existing No. 1 Bunnel has no dolomite.

A Correct.

Q So production from that well has indeed been in the limestone and would you say that the limestone is productive?

A I think the limestone is highly fractured. Being highly fractured I think it leaves access of permeability to the reservoir.

MR. COFFIELD: No other questions.

MR. STAMETS: Any other questions for the witness? He may be excused and we're going to take about a fifteen minute recess.

(Thereupon a recess was taken.)

MR. STAMETS: The hearing will please come to order.

You may proceed, Mr. Coffield.

MR. COFFIELD: All right. Call as my next witness Mr. Jim O'Briant.

JAMES F. O'BRIANT,

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

DIRECT EXAMINATION

BY MR. COFFIELD:

Q Mr. O'Briant, for the record would you please state your name, address, and occupation?

A James F. O'Briant. Midland, Texas. I'm an independent petroleum engineer.

Q What is your relationship to the applicant in this case?

A Consulting engineer.

Q Have you previously testified before the Division?

A Yes, sir.

Q Were your qualifications made a matter of record and accepted by the Division?

A Yes, sir.

Q Are you familiar with Mr. Enfield's application in this case?

A Yes, sir.

Q And are you familiar generally, with the area involved here and the features which are important from a petroleum engineering standpoint as to this particular well?

A Yes, sir.

MR. COFFIELD: Mr. Examiner, I tender Mr. O'Briant as an expert petroleum engineer.

MR. STAMETS: He is considered

qualified.

Q Mr. O'Briant, please refer tow hat we've marked as Exhibit Number Three and discuss that exhibit for the Examiner.

A You all have your copies down there?

Q Yes, they have copies.

A Exhibit Number Three is a cement evaluation log ran in Mr. Enfield's Bunnel Federal No. 1 Well after 4-1/2 inch production casing was set and prior to initiating completion operations in 1965.

The pink or reddish colored intervals marked -- you see marked hereon are intervals that were tried at various times, perforated, acidized, and completion attempts made. For various reasons, communication, water production, no production, these intervals were later plugged off by setting a retrievable bridge plug at 4157 feet KB.

The interval from 7126 to 34 was perforated and acidized four times and resulting in an absolute open flow of 2,060,000 feet per day. This potential was taken in late '65.

Q With respect to the downhole features that are reflected on this exhibit, Mr. O'Briant, what conclusions do you come to with respect to the downhole condition and the adviseability of pursuing remedial work in this hole?

A As below -- let's start off and concern

ourselves with the intervals below the bridge plug.

As you will note on this log, the Western Company ran the log and they made their interpretation of the quality of the cement in those intervals. You'll note a number of places where the cement is considered to be very weak. This was later borne out during acid treatments and a subsequent pressure survey, that various sets of these perforations were all in communication.

At one point the perforations were all squeezed off, pressure tested, showing that they were sealed from the wellbore. Perforations were reinstituted in the top two intervals, reacidized and communication developed again without commercial flow of gas.

Q Mr. O'Briant, what about the condition of this bridge plug? You said it was a removable bridge plug?

A Yes, sir. The bridge plug is called a retrievable bridge plug in that it's used in conjunction with a packer to straddle or isolate a set of perforations for treating and testing purposes. It is not considered drillable. This one has been in this hole since 1965 or approximately 19 years.

If it cannot be filled in the normal fashion, which at this point it is my opinion that it would not be retrievable, it would have to be milled up. Milling operations would take a great number of days and also we would run the risk of sidetracking through the casing, of coming off the side of it, cutting a window in the casing

and going around it.

At the same time we would also introduce a large amount of fluid, cuttings, debris into the upper set of perforations, probably sealing them off and making them nonproductive in the future.

Q State very briefly, then, Mr. O'Briant, would it be your opinion that a re-entry into this hole, because of these various features is inadvisable?

A That is correct.

Q Okay, let's go to Exhibit Four and please discuss that exhibit for the Examiner.

A Exhibit Four is a copy of the daily drilling reports taken from Mr. Enfield's well file for the Bunnel Federal No. 1. It is used as substantiation for the completion attempt that I described earlier and is the source of my knowledge of the completion attempts in this well.

Q And are there any other features about this? This is just simply a resume, or rather the background, rather, for the -- what you discussed in connection with Exhibit Number Three?

A That is correct, sir.

Q Okay, let's go on to Exhibit Five and discuss that exhibit.

Exhibit Five are the C-125 Forms submitted to the OCD for the years 1981, '82, and '83 by Mr. Robert Enfield on this three wells in the Indian Basin area.

This information shows a common shut-in surface pressure indicating that the Bunnel Federal Gas Com No. 1 is in pressure communication with the other two wells listed.

Q What conclusion can you reach, Mr. O'Briant, with respect to the proposed well by inference from the data that's reflected on this Exhibit Five?

A It is my opinion that a well drilled at the location proposed by Mr. Enfield would be in communication with the main part of the reservoir as well as the productive area that he has been draining by the Bunnel Federal No. 1.

Q Let's go on now to Exhibit Six and discuss that one, please.

A Exhibit Six is a gas well reserve estimate that I prepared for Mr. Enfield on March the 8th, 1979.

In this we have presented the shut-in surface pressure versus cumulative gas production and extrapolated this to try to determine the ultimate reserves for the Bunnel Federal No. 1. Our extrapolation indicates 8 Bcf recoverable gas with an abandoned pressure at the wellhead of approximatey 500 psig.

Q Insofar as concerns development of information that has come to your attention and available to you subsequent to this 1979 date, has anything occurred or is anything available to you which would change your opinion as reflected in that exhibit?

A No, sir, it has not.

Q Then based upon that data and what you know about the production which has been taken from the No. 1 Bunnel Well, is it your opinion that there remain hydrocarbons, a significant amount of hydrocarbons, which may be produced from a well located at the unorthodox location?

A Yes, sir. My extrapolation indicates 8 Bcf ultimate recovery. To 1-1-84 Mr. Enfield's Bunnel Federal No. 1 had recovered approximately 4.75 Bcf. This leaves approximately 3.25 Bcf yet to be recovered.

Q And considering what you know about the existing well, Bunnel No. 1 and it's condition, does it seem likely in your opinion that such volume of production could be taken from that Well No. 1 in its current condition?

A Not in it's current condition, no, sir.

Q Is the granting of the order which we seek in this matter in the interest of conservation, the prevention of waste, and the protection of correlative rights, Mr. O'Briant, in your opinion?

A In my opinion it is.

Q Were Exhibit Three through Six prepared by you or under your supervision?

A Yes, sir.

MR. COFFIELD: Mr. Examiner, I move the admission of Exhibits Three through Six.

MR. STAMETS: These exhibits will be admitted.

MR. COFFIELD: We tender Mr. O'Briant for cross.

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

CROSS EXAMINATION

BY MR. CARR:

Q Mr. O'Briant, I believe you testified that a well at the proposed location would be in communication with the main part of the reservoir.

A With the main part of the reservoir as well as the producing area presently encountered by the Bunnel Federal No. 1.

Q And the Bunnel Federal No. 1 is at this time approaching upon where it should be abandoned.

A Mr. Enfield tells me economically it's down to marginal.

Q Where is the main part of the reservoir? Is it to the east or the west?

A The reserve indications are that it is to the east.

Q Now I believe you testified that there were approximately 8 Bcf of reserves that would be abailable to a well at the propose location?

A Yes, sir, that's what the reservoir data indicates.

Q Did you break that data down to determine

how much of that would be produced from Section 18?

A Sir, the decline curve, of course, does not -- pressure decline curve does not define area. If you take, and we have looked at this on a preliminary volumetric basis and we're not submitting that data at this time, but if you take the column available where that bridge plug is set, which is a conservative estimate of the amount of reservoir that might be available to the Bunnel Federal No. 1, and you apply a 2 percent cutoff to that, and you assume approximately 640 acres, or in this case 490 acres, the numbers come out within the range of the 8 Bcf. I believe we came up with an approximate number of 10 Bcf in place.

Q But did you determine how much of that 8 Bcf would be produced from Section 18 and how much would be produced from, say, Section 17?

A Sir, I have no wy of determining this.

Q There are significant hydrocarbons available to a well at this location, I believe you said.

A We stated I feel that there were 8 Bcf initially available; that there remains 3.25 Bcf recoverable.

Q And a significant portion of those would come from Sections 17, 19, and 20, would they not?

A Sir, I have no opinion on that.

Q Thank you.

MR. CARR: No further questions.

CROSS EXAMINATION

BY MR. STAMETS:

Q Mr. O'Briant, on the second page of Exhibit Number Six there -- there are two lines. Is the upper line the sum of Mr. Enfield's other two wells in there?

A Sir, this is just -- both wells had nearly identical pressures, starting pressure and pressure at the date this report was prepared, at the time the data was gathered. So that would be the reserve extrapolation for each well. They're both -- you could plot two lines and you'd come up with one overlaying the other.

Q Okay, but we are talking there about the West Indian Basin Unit Well No. 1 and No. 2.

A Yes, sir. I assigned 44 Bcf to each of those based on this curve.

Q Mr. O'Briant, have you made any estimate to see whether or not it would be possible for Mr. Enfield's new well, new Bunnel Well, to produce more than 3.25 Bcf?

A No, sir, I have not.

Q Do you think that's a possibility or a probability?

A A lot of that's going to depend on how much dolomite he finds and where the placement of the dolomite line. At this point it's an unknown.

Q If you were to complete a well and produce more than 3.25 Bcf, would he be producing more of the

gas from the reservoir than his interest under Section 18 would seem to allow?

A Sir, we're going to have to wait till the well is drilled to determine that. If Mr. Enfield does in fact drill the Bunnel Federal No. 2 at the location prescribed and encounters 100 to 150 feet of dolomite, then we're going to have to assign an area that has volumetric reserves of that type as well as volumetric reserves to the area of his lease that is limestone.

That would then be a composite volumetric approach to it.

At this point I cannot tell you but it would seem reasonable to me that it would be in excess of what we have calculated.

MR. STAMETS: Are there other questions of the witness? He may be excused.

Mr. Carr.

MR. CARR: I call Mr. Holmberg.

RUSSELL A. HOLMBERG,

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

DIRECT EXAMINATION

BY MR. CARR:

Q Would you state your full name and place of residence?

A Russell A. Holmberg, 1610 Seaboard, Midland, Texas.

Q Mr. Holmberg, by whom are you employed and in what capacity?

A Marathon Oil Company, I'm the Midland District Development Geologist.

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

A No.

Q Would you summarize for Mr. Stamets your educational background and your work experience?

A I have a BSC and an MSC in geology from the University of Nebraska and next month I will have completed thirty years with Marathon Oil Company, half of that time in various aspects of exploration, half of that time in various aspects of development and/or reservoir evaluation.

Q Does your area of responsibility for Marathon include southeastern New Mexico?

A Yes, it does.

Q Are uou familiar with the application filed in this case on behalf of Robert N. Enfield?

A Yes, I am.

MR. CARR: At this time, Mr. Stamets, we would offer Mr. Holmberg as an expert witness in petroleum geology.

MR. STAMETS: He is considered qualified.

Q Mr. Holmberg, what does Marathon seek with its appearance in this case?

A In this case Marathon is seeking denial of the application or at least an imposition of a severe penalty on the production from the proposed well.

Q Would you please identify what has been marked as Marathon Exhibit Number One, please?

A Yes. That is a structure map on the top of the Penn carbonate. It has 100 foot contours. It shows the structure dipping to the east, something in excess of 200 foot per mile or about 2 degrees.

Q By whom was the exhibit prepared?

A This exhibit was prepared by the District Exploration Geologist.

Q Have you reviewed this exhibit and can you testify from your own knowledge as to its accuracy?

A Yes, I can.

Q I'd like to direct your attention to Section 18 depicted on this exhibit and ask you who is the operator of the well on that section?

A Mr. Robert Enfield.

Q Does Marathon own any interest in Section 18?

A No.

Q What is the location of the existing well?

A 640 from the south and from the east.

Q 1650?

A Or 1650, I'm sorry.

Q And is that a standard location?

A Yes, it is.

Q How much closer is the proposed unorthodox location than a standard location?

A 80 percent closer from the east and 60 percent closer from the south.

Q Have you studied the well operated by Mr. Enfield in Section 18?

A Yes.

Q Have you as part of that study evaluated the dolomite that was present in that well?

A Yes. There's thirty foot of dolomite in that well from sample studies and from the sample interval it would be from 7270 to 7300.

Q And what part of the reservoir do you believe production is coming from in that well?

A I believe that all of the reasonable production in the Strawn Reef comes from the dolomite. The limestone is in the Strawn Reef, too. It's just that this is a dolomite facies.

Q Are all of the wells that are depicted on this exhibit wells that are completing from the Upper Pennsylvanian?

A Yes.

Q I direct your attention to the well in Section 7 north of the proposed well and ask if you're fam-

iliar with the well drilled in that section.

A In Section 7?

Q Yes.

A Other than the fact that it's indicated the Penn limestone and that it's not capable of commercial production.

Q Now I'd direct your attention to the well located in Section 8 to the east of that.

A There are two wells in that section in Section 8.

Q The one in the southwest quarter.

A Southwest quarter, that's in the limestone and is not capable of commercial production.

Q And these are the two wells that Mr. Neff used in calculating the 2 percent cutoff. Are we talking about the same two wells?

A There's another well that's occupied as the northwest quarter of the southeast quarter of Section 8 and it also penetrated the limestone and is not capable of commercial production.

Q Did either of these wells produce prior to being plugged?

A Not to my knowledge.

Q I'd now direct your attention to Section 19 on this plat.

A Yes.

Q And ask you who is the operator of the well on that section?

A El Paso.

Q Does Marathon own an interest in that section?

A 27 percent.

Q Now directing your attention to Section 20, what is Marathon's interest in that section?

A It's, according to Mr. Enfield, it's 42.5 percent. I had 40 percent plus, so.

Q And that's the section upon which Mr. Enfield operates a well.

A Yes, sir.

Q Did Mr. Enfield advise you of his plans to locate the proposed unorthodox location in Section 18?

A Not to my knowledge. As I understand it this is a routine advertisement that we received in our office on May the 4th.

Q Was that the first time you were aware of this?

A Yes, sir.

Q What rules govern the development of this pool?

A 640 acres.

Q Are there special pool rules?

A 640 acre spacing.

Q Is this pool a prorated pool?

A Yes, it is.

Q To have a full acreage factor in the prorationing formula how many acres are -- is an operator supposed to have dedicated to a well?

A 640 acres.

Q Now I believe you've made reference to the contours on this plat. Are the contours of any real significance to the matter before the Examiner today?

A Not in this immediate area. The oil/water contact, some people use a -3770, which would be way off the map to the east, so really the important part here is the recognition of the limestone dolomite facies in the Strawn Reef.

Q And what does the dashed line on this exhibit indicate?

A That indicates the zero line of the -- the zero line of the dolomite.

Q And the dolomite is north and west of that line, is that correct?

A The dolomite is south and southeast of that line.

Q I'm sorry. How much -- based on this plat how much of the acreage in Section 18 do you estimate originally was capable of contributing production to a well drilled in that section?

A The maximum 160 acres.

Q Do you believe that that much acreage is

available to the proposed well today from Section 18?

A No, sir.

Q And why not?

A Considering the amount of production that they've received from the No. 1 Bunnel, I would expect that it might be able to contribute 40 acres at that location.

Q Have you calculated the additional area of drainage Mr. Enfield would gain by moving a well to the proposed location?

A If you utilize a standard procedure of radial drainage around the No. 1 Bunnel and then also use the focal point for the No. 2 Bunnel, it appears that he would gain about 54 percent additional acreage.

Q Are you prepared to make a recommendation to the Examiner as to the penalty that should be imposed on this well?

A We believe they should have about a 10 percent.

Q Is that a ten percent penalty or 10 percent production factor?

A 10 percent production factor.

Q So that would be a 90 percent penalty.

A 90 percent penalty, sorry.

Q And how did you get that figure?

A Well, if you use -- if you use 60 acres against 640, that would end up with 10 percent.

Q Did you consider recommending a penalty

based on the additional acreage or area of drainage that this well would acquire at the proposed location?

A No.

Q Did you calculate what the penalty would be if you based it on the additional area of drainage that the well would acquire?

A I believe that would work out about 35 percent.

Q About 35 percent penalty?

A Yes.

Q And was that based on using the area of drainage and the well's location based on north/south and east/west axis?

A Yes, sir.

Q And you did not elect to use that?

A No, sir.

Q In your opinion will granting the application of Mr. Enfield impair the correlative rights of Marathon?

A Yes.

Q And why is that?

A It would be draining the acreage in Section 20, the Section 19, for that reason.

Q Do you believe granting the application would cause waste?

A Yes. The well is completely unnecessary.

MR. CARR: At this time, Mr.

Stamets, we would offer Marathon Exhibit Number One.

MR. STAMETS: Exhibit Number One will be admitted.

MR. CARR: I'd pass the witness.

MR. STAMETS: Any questions?

MR. COFFIELD: Yes, sir.

CROSS EXAMINATION

BY MR. COFFIELD:

Q Mr. Holmberg, you have testified, first of all, you heard, of course, Mr. Neff's testimony with regard to the question of existence of dolomite --

A Uh-huh.

Q -- in the No. 1 Bunnel.

A Uh-huh.

Q And it is your opinion to the contrary.

A Yes, sir, from samples.

Q From samples you're taking this --

A Yes, sir. By the way, our limestone dolomite line is also derived from sample studies.

Q Relative to where the perforations are located on the Bunnel No. 1 --

A Yes.

Q -- Well, is it your opinion that it's perforated in the dolomite?

A I don't have those perforations, I'm sor-

ry.

Q I believe that this Exhibit Three --

A Please.

Q -- will reflect the location of the perforations.

A We said before that the dolomite in samples from 7270 to 7300 and here it is perforated from 7206 to 7224 and from 7260 to 7288. That would be in the interval of the dolomite.

Q And is it true, though, with respect to that log that those perforations are located below the bridge plug?

A According to this, yes.

Q Assuming that that's accurate, then, Mr. Holmberg, the production which comes -- if we assume that production is coming from above the bridge plug, there is no production being taken from that well from the dolomite. Would that be accurate?

A If that's true. I have no knowledge of that.

Q And further if that's true, it would likewise be true, would it not, that the production that has been taken from the No. 1 Bunnel Well is coming from the limestone?

A If that's true. I would suggest that the previous witness, your previous witness suggested a number of fractures in this reservoir. If that would be true then

it can be coming from below.

MR. COFFIELD: Pass the witness.

CROSS EXAMINATION

BY MR. STAMETS:

Q Mr. Holmberg, I believe you indicated that your limestone dolomite line was based on samples.

A Yes, sir.

Q Is that correct? So the well in Section 19 that you show all the way in the limestone is -- is again based on samples.

A Yes, sir.

Q And you, let's see, can we tell from looking at your exhibit how good a well that is?

A The initial was 2.1.

Q 2.1, it looks like 21 on my exhibit. I don't see any point in there.

MR. COFFIELD: Mr. Examiner, you want the reserves on the section production to date?

MR. STAMETS: Yes, that would --

MR. ENFIELD: Approximately 3.7 Bcf.

MR. STAMETS: 3.7 Bcf, so it's a well similar to, relatively similar to --

MR. ENFIELD: I might be off a

little bit but it's over 3-1/2.

A 3.8 is what we have.

MR. CARR: It's 3.8 according to what we have.

MR. STAMETS: That's probably 2.1. I was sure it wasn't 21.

Q In any event, that well would be an indicator that the limestone is also productive in this reservoir in addition to the dolomite, is that correct?

A Yes. It would -- I believe it would be -- it would have to be associated with some close adjacency with the dolomite one way or another, either by fractures -- the limestone itself is really almost incapable of being -- having commercial production.

Q Well, it looks like there's no -- no dolomite within about a third of a mile of that well and yet produced 3.8 Bcf. I assume that that then is the realm of possibility?

A Yes.

Q And Mr. Enfield's original well was pretty close to that line so I guess we'd assume that he could have production both from the limestone and from the dolomite.

A Fair enough.

Q Mr. Holmberg, if indeed there is some good dolomite down in the southeast corner of Section 18 --

A Yes.

Q -- assuming that Mr. Enfield does not drill an additional well down there, is it possible that those wells completed in the dolomite over in Section 17 and 20 could ultimately drain reserves off of Section 18?

A I don't know.

MR. STAMETS: Any other questions of the witness? He may be excused.

Anybody have anything they wish to offer into evidence at this point?

Okay, any closing statement?

MR. CARR: I have a closing statement.

MR. STAMETS: Mr. Carr.

MR. CARR: Mr. Stamets, the question presented to you in this case is whether or not a well at the proposed location will impair the correlative rights of the offset operators, in particular Marathon Oil Company.

Mr. Enfield drilled a well at a standard location. He's produced the reserves in that well and is now to a point where the well properly should be plugged and abandoned. The reason, as he stated, was because he has drained the reserves from around that well.

All witnesses who have appeared before you today have admitted that the real objective of developing this area is looking for dolomite. Each of Mr. Enfield's witnesses, including Mr. Enfield, have stated

that.

By the exhibits offered by Marathon and also according to the exhibits presented by Mr. Enfield that were original Marathon exhibits, but two to which they testified they concurred, a very small portion of Section 18 contains the dolomite.

As such, we submit that a small portion of the reserves that will be produced from the well in the southeast corner where it is proposed will in fact be draining out of the dolomite from Section 18. The bulk of the reserves will clearly be coming from Section 17, from Section 20, and some from Section 19.

Mr. Neff drew on the map a 2 percent porosity line and his testimony was that because of that they believe that the limestone in that area, in the area south of that line, would produce gas to the well drilled almost a mile away in the southeast corner.

The problem with that theory is he was basing it on data from two wells, both of which were dry holes in this formation, which never produced any gas whatsoever. We submit that his theory is simply false. He's basing it on wells which never produced in the formation and he's drawing conclusions from those wells and trying to convince you that from that data that part of this formation will in fact be capable of commercial production.

I think the real question is not whether or not some portion of the production can come

from the limestone but how much of the Section 18 will contribute to a well drilled at the proposed location. It is tucked conveniently in between a well that has produced the reserves from the nearest possible standard location. It is tucked in between that point and the offsetting operators.

We submit that to drain reserves from the northwest portion of this section it would have to drain across an area that has already been depleted by Mr. Enfield's own testimony.

We could take the standard approach. We could ask you to impose a penalty based on how close it is to the east line, how close it is to the south line, how much additional acreage it would acquire. We simply think that a penalty that would let them produce 35 percent of that well's capability is too large and the reason simply is that on the record before you here today, those reserves will not be coming from Mr. Enfield's acreage but will be coming from property to the south, property to the east, in which we have an interest.

We would remind the Examiner that it is your duty to protect the correlative of each interest owner in this area and we submit that if you permit this well to produce without a penalty somewhere in the neighborhood of 90 percent, because those are all the acres it has compared to a standard unit, that you will be impairing our correlative rights.

MR. STAMETS: Mr. Coffield.

MR. COFFIELD: Mr. Examiner, the testimony from Mr. Enfield's witnesses and Mr. Enfield, as well as testimony from the Marathon witness with respect to the production from the Section 18 well clearly establishes the fact that production therefrom is coming from the limestone. The bridge plug prevents the production from Section 18 to the Bunnel No. 1 Well from what the Marathon witness believes to be the dolomite in that hole.

It's clear from the testimony of the witnesses that there are hydrocarbons which remain to be produced from the Section 18 acreage. The limestone is productive, not only from Mr. Enfield's Section 18 well but also other wells in the area.

To secure that production, economic, and we're talking about your economic waste being as obnoxious as any other type, requires a new well. It is not justifiable to re-enter the existing No. 1 Bunnel Well and attempt to recover the remaining hydrocarbons from Section 18 from that source.

We have shown clearly that the preferable approach is to permit the well located at the sought location. We agree that there are portions of Section 18 which are not realistically productive or able to contribute to production from the section -- from a well in Section 18, and we stand firmly on those particular points.

With respect to the status of the Section 18 well, we would also remind the parties that

we are -- that the pressures in our well in Section 18 are identical to the other well in the area.

There would clearly be a denial of our correlative rights if we are not permitted to recover from this new well the production which remains underlying Section 18.

It is the duty of the Oil Conservation Division to protect correlative rights and prevent waste, and we believe clearly that our position has been established and we are entitled to the application as presented.

MR. STAMETS: If there is nothing further, then, this case will be taken 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 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. ____, heard by me on _____ 19____.

_____, Examiner
Oil Conservation Division