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

8 June 1988

EXAMINER HEARING

IN THE MATTER OF:

Application of Nearburg Producing Company for an unorthodox gas well location, Eddy County, New Mexico.	CASE 9407

BEFORE: David R. Catanach, Examiner

A P P E A R A N C E S

For the Division: Robert G. Stovall
Attorney at Law
Legal Counsel to the Division
State Land Office Bldg.
Santa Fe, New Mexico

For the Applicant: William F. Carr
Attorney at Law
CAMPBELL and BLACK, P.A.
P.O. Box 2208
Santa Fe, New Mexico 87501

MR. CATANACH: Let's call 9407 at this time.

MR. STOVALL: Application of Nearburg Procucing Company for an unorthodox gas well location, Eddy County, New Mexico.

Mr. Carr has requested continuance of this case until June 22nd.

MR. CATANACH: Case 9407 will be continued to the June 22nd, 1988, hearing.

(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. [illegible], heard by me on [illegible] 19 [illegible].

[illegible], Examiner
Oil Conservation Division

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

22 June 1988

EXAMINER HEARING

IN THE MATTER OF:

Application of Nearburg Producing Company for an unorthodox gas well location, Eddy County, New Mexico.	CASE 9407

BEFORE: Michael E. Stogner, Examiner

A P P E A R A N C E S

For the Division: Robert G. Stovall
Attorney at Law
Legal Counsel to the Division
State Land Office Bldg.
Santa Fe, New Mexico

For the Applicant:

MR. STOGNER: Call next Case Number 9407, which is the application of Nearburg Producing Company for an unorthodox gas well location, Eddy County, New Mexico.

At the applicant's request, this case will also be continued to the Examiner's Hearing scheduled for July 6th, 1988, to be held in Farmington, New Mexico in the same place as described above.

(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. 9407, heard by me on 22 June 1988.

Michael E. Stogner, Examiner
Oil Conservation Division

8/4/88

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

6 July 1988

EXAMINER HEARING

IN THE MATTER OF:

Application of Nearburg Producing Company for an unorthodox gas well location, Eddy County, New Mexico.	CASE 9407

BEFORE: David R. Catanach, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Division: Robert G. Stovall
Attorney at Law
Legal Counsel to the Division
State Land Office Bldg.
Santa Fe, New Mexico

For the Applicant:

MR. CATANACH: Call next Case Number 9407

MR. STOVALL: Application of Nearburg Producing Company for an unorthodox gas well location, Eddy County, New Mexico.

The applicant has requested that Case No. 9407 be continued.

MR. CATANACH: Case No. 9407 will be continued to the Examiner Hearing July 20, 1988.

(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. 2917, heard by me on [illegible] 19[illegible].

David R. Catanach, Examiner
Oil Conservation Division

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

20 July 1988

EXAMINER HEARING

IN THE MATTER OF:

Application of Nearburg Producing Company for an unorthodox gas well location, Eddy County, New Mexico.	CASE 9407

BEFORE: Michael E. Stogner, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Division:	Robert G. Stovall Attorney at Law Legal Counsel to the Division State Land Office Bldg. Santa Fe, New Mexico
For the Applicant:	W. Thomas Kellahin Attorney at Law KELLAHIN, KELLAHIN & AUBREY P. O. Box 2265 Santa Fe, New Mexico 87504
For Enron:	W. Perry Pearce Attorney at Law MONTGOMERY & ANDREWS P. O. Box 2307 Santa Fe, New Mexico 87504

I N D E X

E X H I B I T S

E X H I B I T S Cont'd

MR. STOGNER: We'll call next Case Number 9407.

MR. STOVALL: Application of Nearburg Producing Company for an unorthodox gas well location, Eddy County, New Mexico.

MR. STOGNER: Call for appearances.

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the the Santa Fe Law Firm of Kellahin, Kellahin & Aubrey. I'm appearing on behalf of Nearburg Producing Company and I have two witnesses.

MR. STOGNER: Any other appearances?

MR. PEARCE: I am W. Perry Pearce, of the law firm of Montgomery and Andrews in Santa Fe, New Mexico. I'm appearing on behalf of Enron Oil and Gas. I have one witness.

MR. STOGNER; Are there any other appearances?

Let the record show that the witnesses for Nearburg Producing have been sworn and their credentials accepted in the previous four cases and will your witness for Enron, Mr. Pearce, please stand at this time and be sworn.

(Witness sworn.)

MR. STOGNER: Mr. Kellahin?

MR. KELLAHIN: Thank you, Mr. Stogner.

LOUIS J. MAZZULLO,

being called as a witness and having been previously sworn and remaining under oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Mazzullo, let's look at Exhibit Number One for a moment just as a display by which to orient the Examiner as to what you're proposing to accomplish with this application.

Would you take a moment and identify for the Examiner, what is the designation for this area or for this pool insofar as the Morrow is concerned?

A I believe this is -- the Morrow is designated under the McKittrick Hills Morrow Field.

Q This is an undesignated Morrow gas pool, is it not, Mr. Mazzullo?

A Is it? Yes, I believe so.

Q And as best you know, this is not a pro-

rated gas pool, is it?

A No, it's not. That's correct.

Q The spacing for the wells that are drilled into the Pennsylvanian gas formations are 320-acre spacing?

A That's right.

Q And a standard location for this type of development would be to have a well located 660 from the side boundaries and 1980 from the end lines?

A That's right.

Q Using Exhibit Number One as an orientation map, can you identify for us what wells are curremtly completing out of this undesignated McKittrick Hills Morrow Gas Pool?

A There is only one well at the current time and it's indicated by the green dot in the northeast quarter of Section 11, Township 22 South, 24 East, and that is the Enron No. 1 Chama Federal.

Q Do you recall, Mr. Mazzullo, the footage location for the Enron well in terms of its relationship to its spacing unit?

A Yes, I believe it's 700 and -- let me get that exact -- it's 780 feet from the north line and 1350 feet from the east line.

Q From the east line you said 1350?

A Yes.

Q This well is at an unorthodox location, is it not?

A Yes, it is.

Q The spacing unit assigned to that well is the north half of 11?

A Yes, it is.

Q When we look in the south half of 11 and see the red circle and the red dot, the red dot and the red arrow.

A Yes.

Q That is your proposed unorthodox location?

A It's a proposed unorthodox location, which is the re-entry of the McClellan No. 1 Federal.

Q The McClellan Well was originally drilled as a Cisco well?

A Yes, it was.

Q What is the footage location for the well?

A The footage location for the McClellan re-entry would be 2310 feet from the south line and 960 feet from the east line of Section 11.

Q That well is approximately, then, 330 feet from the line that separated the north half and the

south half of Section 11?

A Yes.

Q Is this area and these particular wells, are they producing from a particular or -- the only producing wells is the Enron Well, that is producing from what particular zone in the Pennsylvanian formation?

A It's producing from a number of different sands in the Morrow formation.

Q Your request on behalf of Nearburg Producing Company is to re-enter the existing well that's been plugged and abandoned.

A Yes.

Q It was originally drilled in what year, sir?

A 1978.

Q And you desire to re-enter it and attempt to complete it in one of the Morrow stringers?

A Yes.

Q Let's talk generally, if you will, Mr. Mazzullo, about the geology of this specific area.

Is this typical of an unorthodox well location by your client whereby you're seeking to move towards known production in order to minimize the risk of a well drilled on your spacing unit?

A Can you please rephrase that question?

Q My question is, is this typical of Morrow development we see in southeastern New Mexico whereby you'll have one operator seeking an unorthodox location in order to minimize his risk by moving towards established production?

A Not necessarily, no, sir.

Q What is the reason that you have chosen this particular location for testing the Morrow in your half section?

A There are a couple of different reasons for it, one of which is the relative inflexibility of movement around here, because of the topography. This is a very environmentally sensitive area. We would like to take, have the advantage of utilizing an already existing wellbore on an already existing drilling pad; the problem being here, as you can see from Exhibit Number One, which is a 50-foot contour interval topo map, if we were to move towards a more standard location to, say, the south, we would be going down a very steep slope.

If we were to move to the west, not only would we be also going down a steep slope, but there are geologic factors at risk here, which prevent us from wanting to go any further to the west.

The geologic factors in this area are -- are very complex. By re-entering this particular wellbore,

we are gaining no geologic advantage in particular; as a matter of fact, we are losing some structural position relative to the existing Enron Well because we anticipate that we will be anywhere from 100 to 125 feet low to the producing Enron Well.

The work that I've one throughout Eddy County in the Morrow has shown that in this particular part of Eddy County, unlike the areas to the north where we've been involved with previously, there are no large areally extensive sandstone reservoirs in the Morrow. They are composed here of very narrow, thin-bedded, relatively thin-bedded, sinuous, discontinuous sand lenses.

Q Do you have an opinion, sir, as to whether or not approval of this application without a location penalty would give Nearburg an unfair advantage over Enron in developing and producing the Morrow sands in this section?

A I don't believe it would give us an unfair -- Nearburg an unfair advantage at all.

Q What is the basis for that opinion?

A Well, the basis for that opinion, it lies in the -- for one thing, in the nature of the reservoirs themselves, very low permeability -- relatively low permeability sandstone reservoirs, again, laterally discontinuous. The chances of actually draining any producing

zones that Enron is currently producing out of is low. The chances of getting into other zones that have not been produced is pretty high.

Q Let's turn specifically now to Exhibit Number One. In the north half of section 11 where the Enron Well is located, have you had an opportunity to examine the OCD case files and well file for that well?

A Yes, I have.

Q Does that file reflect the reasons why the Division approved the unorthodox location for the Enron Well?

A Yes, it does.

Q And what was the basis for approval?

A Okay. First I'll preface by saying that when this well was originally drilled it was originally drilled by Florida Exploration Company on a farmout from Chama Petroleum, which is the predecessor to Nearburg Producing Company.

At the time that Florida permitted the well, it was permitted to the Cisco Canyon formation in order to test the Cisco Canyon formation and the upper part of the Penn section, specifically up through the Strawn and Atoka.

It was not permitted as a Morrow well originally and during the course of drilling operations I

was involved personally at the wellsite because I was asked my opinion, being with Chama at the time, as to what was going on out there, and Florida Exploration people were inexperienced in the area and they solicited my opinion upon certain things.

When it became clear that they were not going to be making a well out of the Cisco Canyon, they had tested it and it had proved to be uneconomical, they decided, well, they initially decided that they were going to abandon the location.

Q Was it as a result of your efforts and analysis and knowledge of the Morrow that you encouraged that company to go ahead and attempt to drill and complete and test the Morrow formation?

A Yes, that was one -- one reason why they decided to go ahead and deepen the well and the well file for that well reflects the fact that they petitioned the Commission for administrative approval to -- well, they filed a sundry notice to deepen the well during the course of the drilling operations.

Q As a result of the administrative approval was the Enron unorthodox well location penalized in terms of its producing rate?

A Not that I know of.

Q Was there ever a Division hearing with

regards to the approval of the Enron location for production out of the Morrow formation?

A There's no record of any such hearing.

Q Let's look now at the information with regards to the south half of Section 11. You've indicated to us that this is a re-entry of an existing well.

A Right.

Q Describe for us generally the important points with regards to the original well itself.

A Okay. Let me just backtrack a minute and close my discussion about the Enron Well.

The main consideration for the unorthodox location for the Enron, as reflected in the well files was topographic. They filed a petition for the unorthodox location based on topographic factors alone.

If you look at the topographic map you'll see that that well was almost at the top of -- the top of a peak; as a matter of fact, it's on the -- it's located on the only flat spot on that steeply -- on that steeply -- on that steep slope in the area. The same consideration is asked here in terms of Nearburg's re-entry of the McClellan Well.

The McClellan Well was originally located more or less on the only flat spot along the side of the same steep hill. The pad is already in existence. It

has not overgrown substantially. You can't really move off in any one direction from that location without getting yourself into a situation that would require extensive blasting, additional road work, and additional environmental impact in the area.

Q Apart from the topographic considerations, has Nearburg also examined the issue of the economics with regards to a new wellbore versus the re-entry?

A Yes, I believe they have.

Q And that will be the subject of Mr. Nearburg's testimony?

A Yes, it will.

Q All right. Let's go now to the geology. Let me direct your attention to Exhibit Number Two. If you will go to the board, Mr. Mazzullo, we have put on the hearing room wall a copy of your Exhibit Number Two, and here's a pointer if you would like to utilize it.

A Thank you. Okay.

Q Before you discuss your interpretations and the information on the display, simply take a moment, identify the display, and show us the orientation of the line of cross section as we move across this area.

A Okay. The orientation of the line of cross section is captioned on the subsequent exhibits here which everyone seems to have out by now.

One thing that you can see right away from here is that there are a number of thin-bedded sands. This is quite a bit -- this is a bit different from what we've seen up north, further north in Eddy County in previous hearings in that here the Morrow is composed of a lot of thin-bedded sands which are almost -- which are very hard to correlate from one well to the other; very hard to establish stratigraphic equivalents from one well to the other just by sliding logs together.

I've had a considerable amount of experience trying to do this and tried different mapping techniques and it will come down to a mapping technique that I've described before in order to try to gain the best sense of what's going on here.

Q Are there logs for any of the wells in the immediate area that would serve to better provide tools by which you can analyze the Morrow stringers?

A No. This -- this cross section more than adequately describes any east/west, that is perpendicular to flow direction, section through the Morrow. This is more or less characteristic of what's going on.

I have shown some of the sands that may or may not be correlative from well to well, whereby there are others that clearly do not correlate from one end -- from one well to the other. There are some that are very

limited in lateral extent. There are others that may -- may be cutting at angles sufficient to see what appears to be lateral continuity, but remember these -- these sands are meandering; they're very low energy, low gradient type streams that are meandering to some extent. We're more or less cutting across depositional strike for the -- in some cases we're going right across meanders. So you cannot establish stratigraphic equivalents with certainty. That's one thing that -- that this cross section is trying to show.

Q The fact that we have these small, thin, Morrow stringers discontinuous throughout the Section 1, what does that tell you as a geologist about the possibility of having the Nearburg Well re-entry pose an unfair risk to the Enron Well simply because of location?

A Well, first of all there is a -- there is an -- there is a very good chance of intercepting other sands within that within that (unclear) or within that deepened wellbore which the Enron Well does not have in common -- which will not have in common with it.

The second thing to realize here is that lithologically the sands in this area are very -- are finer grained, generally. They contain more clay and minerals as a rule over what we see in some of the larger depo centers up to the north. These sands are by nature low permeabil-

Q Exhibit Number Four.

A Exhibit Number Four. It is a west to east structural cross section which proceeds from the Curtis Inman No. 1 Walt Canyon in Section 3 eastward to the Enron, the Florida Enron No. 1 Chama Federal, across the proposed location, and then southeastward into the two wells that are in Section 13 to the southeast of the proposed location, the Uriah No. 1 Shelby Federal and the Southern Union No. 1 Shelby Federal.

The top of the Middle Morrow that is the top of the major producing interval in the Morrow is indicated, as is the top of the Barnett Shale. Most of the production out of the Morrow in this area, except for some minor production a little bit further up the hole, which I'll get to in a minute, is realized from the interval between the top of the Middle Morrow to the top of the Barnett Shale. All of the production in the Enron Well is from perforations within that same interval.

Q What is the geologic basis upon which you have selected these four logs in order to interpret and place upon your structural cross section?

A One of the most useful things to do in thin-bedded fluvial sands is to draw a section perpendicular to flow directions in order to gain a sense of the lateral continuity of the sands.

ity sands. The chances of them actually draining between the Enron Well and the new location over the period of time that this well has been in production is very slim, in my opinion geologically speaking. The permeabilities -- we're talking about several millidarcies of permeability if they are that high at all. The sand have got a lot of clay matrix in some places; a lot of calcite and dolomite cements, which tend to cut down considerably on lateral permeability.

Q Let's look at what Enron and the operators of the Enron Well have done in their attempts to complete and produce out of the various Pennsylvanian formations that are shown on the cross section.

A Okay. The only test that was done down hole on this well was one drill stem test which covered a number of the different sand stringers in this Middle to Lower Morrow interval.

Q How is that drill stem interval identified on the display?

A It's identified by this Z-shaped --

Q Black line?

A -- symbol, black line, here. The results of that drill stem test were not very encouraging. As a matter of fact, there was no gas recovery whatsoever except for a very slight gas cut mud, which in a Morrow

test doesn't mean a whole lot.

The test recovered the complete water blanket that is set on top of the test tool and recovered 1880 feet of gas cut mud but no gas to surface; somewhat tight formation conditions.

The well itself, on the other hand, may have been drilled a little bit overbalanced; in other words the difference between the hydrostatic pressure and the formation pressure was over 1200 pounds. It might have had an effect on squelching some -- some things that you may have been able to find there.

Nevertheless, Florida, when they drilled the well, went back in and perforated a number of the zones which showed -- this one in particular, which showed fairly decent gas crossover effect on the neutron log.

Q You're showing that perforated interval within the drill stem test interval.

A Within the drill stem test, right. They went ahead and they perforated that. They perforated another zone within that drill stem test interval and then one below, a very thin zone below the drill stem test interval, and one above, and they potentialed it to flow 1237 MCF of gas a day with some oil.

It has as far -- well, up to January of 1988, the first of January, 1988, produced only a little

bit more in excess of 220 and a quarter BCF gas with 1239 barrels of oil total to date.

Q There's additional perforation above the drill stem test interval up in the top of the yellow area on the log.

A Right.

Q What is that?

A It just barely scratched the top of another very thin-bedded sand here, which I believe to correlate, perhaps, down dip here, but it showed very poor crossover. By my cutoff criteria that I have and will describe for this well, have described before and will describe for this area, I wouldn't even classify that as a potentially productive sand, but it was shot, nevertheless, perhaps because -- I believe because they had some show on the mud log that prompted them to do that.

Q In analyzing the log and the way Enron drill stem tests and perforated the Morrow interval there, do you find any stringers that ought to be perforated and tested to see if there's further production potential in the well?

A There's not a whole lot to encourage me to do that in this well.

Q My question is, in your opinion has that operator in operations for that well perforated and tested

all reasonable zones that might potentially be productive.

A I believe so, yeah, I believe they have.

Q You don't have any other Morrow stringers isolated that have not been tested in your opinion.

A Oh, there might be a zone up in the Upper Morrow which I'll refer to here in a minute that may have -- may have been -- should have -- perhaps should have been perforated but we'll go over the results of the test through that zone in a minute and I'll show you what my reasoning is on that.

I participated in selecting the zones to be perorated in this well at the time that this well was completed, again because of the -- the relative inexperience of the Florida personnel that they had at the time, and they asked my opinion of it, and so I was involved in the selection process there.

Q Is there information known to you based upon your participation in that well to cause you to reach an opinion as to what is the likely source of the gas produced in terms of identifying which particular stringers are contributing to production?

A I would say that in all likelihood the zone near the top of the drill stem test interval is the only one that shows enough gas crossover and enough of a characteristic according to the regional cutoff criteria

that most of the gas, I'd say most of the gas should be coming out of there, although when they drill stem tested they didn't get anything out of it, which might lead one to believe that these two zones are the only two producers here, but it's very hard to tell.

MR. STOGNER: Would you give me the perforation interval on those two zones that you're talking about?

Q The two that are not in the drill stem (unclear) --

MR. STOGNER: The ones that you just said that are in the drill stem that you believe is --

A The one of them that may be productive may have been 10,362, I believe, to 70. That's what it looks like. That's the only one that looks reasonable.

MR. STOGNER: And what about that lower one?

A The lower one down here is about 3 feet thick. It's about 10,500 -- I have an (unclear) but about 10,516 to 20, something like that, 16 to 19.

Q Let's leave the Enron well for a moment and as we move then from west to east across the cross section we go through your proposed location and then we get the next well. What is the next well?

A The next well is the Uriah Exploration No. 1 Shelby Federal.

Q And how far away is that well from the Enron Well, approximately?

A It's approximately a little bit more than a mile south and east.

Q And that is located in Section 13 --

A Section 13.

Q -- up in the northwest quarter?

A Right.

Q By the time we get to the Uriah Well, show us what happens to the stringers that you have found in the Enron Well. Do we find those same stringers present in the Uriah Well?

A Again I'll qualify by saying its hard to correlate them well to well. In my best -- with my best correlation there is perhaps some correlation between one -- there is one of the zones, perhaps two of the zones, but then again there are other zones that -- in the Uriah Well, that do not correlate to the Enron Well.

Q When we get to the Uriah Well, were they able to establish commercial production in any of their Morrow stringers?

A They tested a zone up in the upper part of the Morrow which is the subject that I'm going to be

introducing here in another minute, but that was the only test they ran in the Morrow. They never ran any tests down here, although I feel that there is some commercial productive stringers in that zone which are not present in the Enron well.

The reason they didn't test it that there is to tell, the only thing I could imagine is that when they when they drilled it also, they may have also drilled it 1200 or more pounds overbalanced. These are very sensitive sands. As I said before, they have a lot of shale, a lot of clay mineralogy and if you drill them overbalanced you run the risk of essentially damaging the formation during drilling operations.

Q When we go back to your projected location now, we do see at least two of the stringers where you have interpreted that they may extend laterally at least to the proposed location for the Nearburg well.

A Right.

Q Do -- by drilling at and recompleting at an unorthodox location, Mr. Mazzullo, do you gain in your opinion an advantage over Enron?

A No, as a matter of fact, we're going down dip from Enron, as I'll show on our structure map, but as you can see from this cross section, we -- we're losing

advantage on those zones by going down dip by as much as perhaps 125 feet. So I don't see any advantage being gained on the zone that they're producing out of, even if they are -- even if they do correlate to the wellbore that we propose to be in.

Q Basically, then, you see as a geologist in examining this area, significant lateral discontinuity when you try to map these Morrow stringers from well to well.

A Definitely.

Q And the structural difference, displacement between your location and the Enron location is approximately 125 feet?

A It could be as much as 125 feet.

Q What does that mean in terms of an advantage or disadvantage between locations?

A This area here is characterized by water production out of -- out of the Morrow sand. As a matter of fact, if we look here at the Southern Union Shelby Federal, they came in and perforated and swabbed on a number of these sand stringers and in most cases they got a little bit of gas and water production out of that.

So structural position is important insofar as staying above the gas/water contact in a number of these sands.

The other factor to consider is the location of this fault. I believe there is a major fault, a couple hundred feet displacement, which comes pretty close to the Enron Well and comes pretty close to the proposed location, as well, and I'll show you in subsequent figures how that figures into our -- our argument.

Q Does that complete your presentation on Exhibit Number Two, the Exhibit Number Two part of your testimony?

A Yes.

Q All right, Mr. Mazzullo, let's go Exhibit Number Three, if you will, please.

A All right.

Q And would you identify and describe that exhibit for us?

A Exhibit Number Three is a log composite section showing on the left a gamma ray log, in the middle the compensated neutron density log, and on the right the dual induction microlog for the Enron or Florida No. 1 Chama Federal.

The Lower to Middle Morrow interval which I referred to on the cross section, Exhibit Number Two, as being between the top of the Middle Morrow and the top of the Barnett Shale, is indicated here on Exhibit Number Three, the Lower Middle Morrow interval. In addition

to that interval there's another interval I've identified as the Upper Morrow Unit, which is another unit which I'm hoping to chase down in our new location.

Yet, as I've described in previous testimonies, I'm trying here to find a way to map the Morrow efficiently, effectively. Since these stringers individually are very -- are almost impossible to follow with absolute certainty and well to well, I've devised a way to map them all that shows total net sand versus total productive porosity.

What I do again is I take an arbitrary cutoff of 50 units gamma, API gamma.

Q (unclear) the arbitrary, that's simply subjective on your part?

A It's based partly on what is -- what constitutes the best, cleanest production -- the best productive sands in the Morrow in this area of Eddy County.

Q You don't mean to equate your use of arbitrary to a layman's use of being arbitrary --

A Oh, no, no, no, no. I admit, it's a poor choice of word there. 50 unit API gamma cutoff is what I think is a reasonable cutoff for a clean sand, clean productive sand in the Morrow. These clean productive sand stringers are indicated by the yellow coloration on the gamma ray curve, and you see a number of them that are ver-

tically separated from one another.

Then across to the compensated neutron density curve, I show a cutoff of 8 percent density porosity, which I believe is the minimum that you need to get a decent productive sand and these again are shown by the yellow coloration underneath or above the density curve in the middle part of the -- the log section.

What this is showing us now in the case of the Enron Well is that, yes, there are a number of clean vertically discrete sands but out of that whole package of sands that you see over there, not all of them show potentially productive porosity.

It also shows that the upper unit in this particular well does have a few feet of density porosity corresponding to a 12 or 14 foot sand stringer.

This upper sand stringer was -- well, I'm not quite sure it was actually tested. There was a drill stem test run across the upper part of the Morrow here, but it started below the base of that unit. It didn't cover 100 MCF of gas a day before the flow of the gas died, but it came in looking a little bit tight, at least the drill stem test appeared tight, and again we have the drill stem test over the Middle, Lower Morrow interval is also captioned on this diagram.

Q From that analysis, then, are you able

to interpret and project what I've called an isopach map?

A Yes.

Q And that's Exhibit Number Four?

A Yes. Exhibit Number Four is taking this type of analysis again for each well that has penetrated the Morrow, taking the total number of feet of clean sandstone -- well, first of all, let's -- let's look at -- let me break Exhibit Number Four down first before we -- Exhibit Number Four is a montage. On the left side is the structure map on the top of the Morrow. The middle is the isopach of the Lower and Middle Morrow and below the Middle Morrow Unit, and the righthand diagram is the -- an isopach of that Upper Morrow Unit that I referred to in Exhibit Number Three.

Let's go to the middle unit here first so we can carry on my train of thought.

The middle diagram shows the Morrow isopach map for the Lower to Middle Morrow interval that I've captioned on Exhibit Number Three. The numbers aside each well symbol, each Morrow well symbol, which are the triangular symbols in this case, refer to the total amount of clean sand which does not exceed 50 units API.

The square symbols refer to wells that have been TD'ed only as far as the Cisco Canyon so there are no data points relative to the Morrow in those wells.

The dotted pattern refers to areas where there is greater than 10 feet of 8 percent porosity within the net sand in the Lower to Middle Morrow interval.

This diagram is showing that the Enron Well, which is the solid triangle in the northeast quarter of Section 11, is on the margin. It's marginally -- well, you could count up the number of -- the net amount of porosity and the Enron Well is at the margin of what I consider to be effective, productive porosity.

What we're hoping to do because of the isopach values on wells to the south and east, we're hoping to gain a number of feet of net clean sandstone and at the same time hoping to wander into a better porosity position. The more sand, the better chances we might have of providing ourselves with greater porosity, net porosity.

On the lefthand side of the diagram -- of this montage is the structure map on the top of the Morrow.

The Enron Well has got a subsea value of 6161. You can see from wells to the south and east that we are generally going down in a downward -- going down dip to the east/southeast but the main factor here is the possible presence of a major fault west of the Enron location, west of our proposed location. We do not want to get -- even if we had the topographic option of moving to the west, we

wouldn't want to, anyway, if we could avoid it, because of the chance of getting on the wrong side of the fault, so to speak.

So, anyway, without topographic considerations we would want to stay over further to the east, anyway.

Q When we look at the center display on Exhibit Number Four, in approximations it appears as if the mapping of the Lower and the Middle Morrow, when you take that area and divide it between the two spacing units between Nearburg and Enron, is generally comparable in terms of the potential for having Morrow net sandstone that you have identified as being potentially productive.

A Oh, yeah, they would be close; maybe, hopefully, a little bit more in the proposed location.

Q But when we look at that area that is stippled with the little dots, we find that confined to the east half of the east half of the section.

A Right.

Q And then as you divide that north in half -- north/south half, I won't say it's equal, but it's comparable.

A Yes, it's comparable.

Q All right. When we go to the Upper Morrow, what happens in terms of balancing the equities if you

can in terms of potential sand production when you look at the north half versus the south half?

A I believe the south half offers more potential in the upper sand, which was not perforated in the Enron Well, and I -- and the result of the drill stem test up there, even if it -- if it indeed tapped into the upper zone, indicated that it was tight, and I've shown this by placing the Enron Well on the Upper Morrow zone in a very marginal position relative to potential productive porosity.

I believe that we have the potential of gaining quite a bit of stratigraphic advantage at our proposed location relative to the Upper Morrow Unit. It's a unit that is not produced in the Enron Well. It is produced down in the Rock Tank Unit down to the southeast but that's in another part. That's -- that's another world altogether.

But I believe this is zone that needs to be developed in our proposed location.

Q Based upon your geologic analysis, do you have an opinion as to whether or not approval of the Nearburg location without a penalty will provide that operator with an opportunity to test potentially Upper Morrow Units and recover gas therefrom that might not otherwise be recovered?

A Definitely it would. It definitely would provide them the opportunity of recovering additional gas that has not been developed.

Q With regard to the Upper Morrow analysis, Mr. Mazzullo, do you have an opinion as to whether Nearburg gains an advantage over Enron at the unorthodox location?

A Concerned with the Upper --

Q Yes, sir.

A -- Morrow? Geologically, yes, they do. There is an advantage to drilling down there simply because the porosity pinches out by the time you -- the productive porosity pinches out by the time you get to the Enron Well. There's no proven production in the Enron Well from the Upper Morrow and as I strongly believe that at the proposed location that there is an opportunity for enhancing production from that or establishing production from that zone.

Q When we look at the Upper Morrow, then, the advantage gained by location is one that you would equate as being fair or unfair?

A I'd say it was fair advantage. It's the nature of the Morrow.

Q All right, sir, let's turn to Exhibit Number Five, Mr. Mazzullo.

What's the source of this document?

A This document is a --

Q Where did you get it?

A I got it out of the Florida Enron Chama Federal Well file out of the -- in this office (unclear) Commission files.

Q And have you had -- have you reviewed the information contained in the OCD well files for this well?

A Yes, I have.

Q All right. What does your review of this letter tell you about the Enron Well in terms of analyzing the test information in relation to the geologic opinions that you've reached here today?

A This document, which is a summary report on the well from a consulting geologist to the Florida Exploration Company back in 1984, November of 1984, expresses the primary objective of the well. It shows, it states right there on the first page, highlighted, that the primary objective was the Cisco Reef in the area and that its potential was considered unsatisfactory because of large volumes of fluid locked into the formation prior to the drill stem test. The drill stem test itself eventually came out looking wet. It recovered nothing but sulphur water out of the Cisco. The Cisco Canyon and the deeper Strawn were considered to be commercially nonproductive,

which prompted Florida initially to consider abandoning the location before Chama and myself convinced them otherwise, convinced them to deepen the well to the Morrow.

That well, they state, was running structurally high relative to the surrounding control and so they did ultimately decide to drill the well deeper to the Morrow, but they would not have done that had we not exerted -- had they not asked our opinion, I don't think.

Q Does the information contained on page 2 with regards to the drill stem test information, is that cumulative of what you've put on Exhibit Number Two as additional information that we can derive from analyzing that page?

A No, as a matter of fact, the information that I've put on my -- on mine is a little bit more complete and it's based on the actual drill stem test charts that Halliburton provided.

Q All right. Let's turn now, sir, to Exhibit Number Six and have you identify and describe that exhibit.

A Exhibit Number Six is simply the production history, it shows the production history of the Enron Chama Federal from the date of first producion, which is August of 1985, or at least that's what's been reported as the date of first production. through the end of 1987.

The well initially produced in the first month 5389 MCF of gas and then decreased somewhat to the end of 1985 but in following months production, month-by-month production became very erratic.

In addition to that, the well had -- was shut in for periods of time; at one time for a period of two months, July and August of 1986 and then put back on production in September and it's produced production, monthly production, varied quite a bit from several thousand MCF up to 16,000 MCF a month, and then it was shut in again between May and August of 1987 before it was brought back on stream in September of '87, produced 7 MCF, shut in for another month, opened another month in November, produced 41 MCF, and then 3659 MCF in the month of December, 1987.

I don't know the exact reason for the erratic nature of this production, but it seems to me that one possibility might be that the sands themselves -- there are a couple of different possibilities: One is geologic, that the sands are just tight and that production is very hard to establish out of these sands.

The other may be something that Mr. Nearburg might be able to elaborate a little bit more on and that -- that is the factors having to do with whether or not the well was able to overcome the line pressure in

the Gas Company of New Mexico line that services this well.

Q In analyzing the production information that's reported to the Commission insofar as it confirms or rejects your geologic opinion, you've told us that the quality and the magnitude of the volumes of production are not inconsistent with your geologic opinion.

A Yes. In my opinion, I've looked at now a couple of thousand Morrow wells in my career analyzing the Morrow. This production history is not indicative of a good Morrow producer as I see it right here out of the production history.

There might, as I say, be other factors i'n not aware of but a good Morrow well would not behave as erratically as this one appears to have behaved since its date of first production and it would have made substantially more gas to this date had it been a -- had it been a better well.

Q Ultimately, then, Mr. Mazzullo, what is your recomendations to the Examiner with regards to the approval of this unorthodox location without a production penalty?

A I don't believe that, you know, notwithstanding topographic effects, you know, not considering that for the moment, but geologically I see no reason why Nearburg ought to be penalized for -- for then trying to

develop undeveloped resources in the Morrow both within the Middle and Lower Morrow interval, as well as the Upper Morrow Unit that I've described.

Geologically do we see a section when we look at Section 11 and look at the Morrow formation where we see a uniform sand body that has the potential to drain and produce the 320-acre spacing units that statewide spacing applies to wells at this depth?

A In my opinion, based upon what I've seen in my experience, I don't believe so.

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

We move the introduction of Exhibits One through Six at this time.

MR. STOGNER: Are there any objections? Exhibits One through Six will be admitted into evidence.

Mr. Pearce, your witness.

MR. PEARCE: Thank you, Mr. Examiner.

CROSS EXAMINATION

BY MR PEARCE:

Q Mr. Mazzullo, let's look first at your cross section exhibit, please.

A Okay.

Q During your testimony you've indicated that you believe this is a complex area with stringers which, all of which cannot be traced from one location to the other, as I understand it.

A Right.

Q And you also indicated during your testimony that in your opinion the Enron Well --

A Let me go back to it, excuse me.

Q You indicated, I think, that in your opinion the stringer from -- that is perforated at 10,362 to 10,370 is probably the most productive stringer in the Enron Well, is that correct?

A I said in my opinion, by my cutoff criteria, that that would appear to have been the best sand in that whole package.

Q And you also mentioned the perforations below the bottom of that DST as possibly contributing --

A Yes.

Q -- I don't know that you used the word "significant" --

A No.

Q -- did you use it?

A No. No, I wouldn't say significant, I just said that it had 3 feet of good crossover.

Q You also indicated, I believe, that when the Enron Well was drilled, the Upper Morrow was not perfed, is that correct?

A That's right.

Q Looking at your Exhibit Number Five, which is the letter you got from the OCD files?

A Uh-huh.

Q The bottom sentence of the second full paragraph on the first page?

A Uh-huh.

Q Although the test was successful it's considered unsatisfactory because of the large volume of drilling fluid lost to the formation prior to the test.

A Right.

Q What --

A That's referring to the test in the Cisco Canyon formation.

Q And what does losing that drilling fluid to the formation during drilling indicate to you?

A I was out there when that happened. The formation took a -- took a considerable amount of drilling fluid when they -- when they drilled through it, but when they drill stem tested it they got back what analyzed out as formation water, sulphur water.

They did get back, probably, some mix-

ture of formation water and drilling fluid but the test, I don't understand the exact -- why he worded it this way. The test was successful in that it proved that the zone was wet.

We do have the recovery well somewhere in the file in Dallas. I think I have a drill stem test chart and analysis from Halliburton.

Q Mr. Mazzullo, at least once and I think more than once during your testimony you indicated in response to one of Mr. Kellahin's questions that you believed the approval of Nearburg's application without a penalty would allow increased recovery. Did I understand that correctly?

A Well, potentially it would allow us to produce from zones that have not been produced out of before.

Q There -- there are zones which you would not test and produce if an allowable restriction is placed on this well which you otherwise would, is that what you mean?

A No, I don't mean that.

Q Okay. I don't -- I don't understand your answer.

A There are -- because of the nature -- because of the nature of the sands and the way they're laid

down and interrelate to one another, we anticipate -- and -- and the fact that we had an Upper Morrow zone that's not productive within a couple of mile radius of our proposed location, that we are potentially in a -- we will be potentially in a position not only to develop other sands that are not being developed at the present time in the Enron Well or any other well, for that matter, around there, but also in the upper -- in the Lower or Middle Morrow, but also out of that Upper Morrow sand, which hasn't even been tested, or which hasn't been perforated in the Enron Well.

We are -- there's a lot of lateral discontinuity within the sands. I anticipate that we will be getting into sands that you don't see in the Enron Well. You don't even see them in the Southern Union Well.

Q I -- I still have the same failure of understanding. I don't understand what -- how the imposition of an allowable restriction on this well would negatively impact the process you've just described.

A Well, I'm -- I'm not quite sure I understand your -- your question.

Q Do I understand from looking at your Exhibit Two, that you do not believe that there are any of these Morrow Sand stringers that go from -- toward the west from the Enron Well?

A Oh, yeah, they no doubt do but they've

been cut by the fault. There are, and, as a matter of fact let me point out a couple that may -- may or may not.

These two sands here, for example, that -- one of which you can -- you can almost trace into the Curtis Inman Walt Canyon Well, appears to be correlative to that sand right there, one of the perforated zones in the Enron Well, but it has subsequently been cut by the fault.

The same could be said for this, which I don't see in the Inman Well. It's probably correlative to this little zone right down here. It comes across the fault but it dies out before you get into the Inman Well.

Look at the difference in the amount of -- total amount of sand in this well, say, versus that well right there, it's quite -- quite a bit more.

MR. PEARCE: Nothing further, Mr. Examiner. Thank you, Mr. Mazzullo.

MR. STOGNER: Mr. Kellahin, do you have any redirect questions of this witness?

MR. KELLAHIN: Nothing.

MR. STOGNER: I have no questions of him at this time. The witness may be excused.

MARK NEARBURG,

being called as a witness and being previously sworn and remaining under oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

A Mr. Nearburg, let me have you take a moment and look at Exhibit Number One.

A Yes.

Q Have you personally been involved on behalf of your company in efforts to obtain approval for the re-entry into the well in the south half of Section 11?

A Yes, I have.

Q Is it your custom and practice to perform the function for your company of analyzing and reviewing the costs for wells?

A Yes.

Q And you're familiar with the costs of the re-entry and what it would cost to drill a new well?

A Yes.

Q Are you also familiar with the regulations and the procedures with obtaining approval from the Bureau of Land Management for a surface location in the south half of 11?

A Yes, I am.

Q And have you had an opportunity to understand and participate in the knowledge for the ownership within Section 11?

A Yes.

Q Let's take a moment and look at the topography as shown on Exhibit Number One. Based upon your experience and involvement with this particular project, Mr. Nearburg, is there another probable surface location in the south half of 11 whereby Nearburg could drill a Pennsylvanian gas well?

A Not economically and probably not with the approval of the BLM.

Q What is the topographic advantage for the BLM as well as Nearburg in the re-entry of the old Cisco well in the south half of 11?

A About year ago this area was included in an environmental study, an extensive one done by the BLM, significantly affecting the economics of exploration in this area due to the precautions you have to take for the environment.

It's such an extensive ruling, and so burdensome, that we feel that the re-entry of this well and deepening it, in addition to the questionable quality of the Morrow formation in this area, justifies our efforts.

We considered having the BLM representatives here so that you could hear their feelings about this area, but you're welcome to call Barry Hunt in Carlsbad and he can explain the difficulties of exploring this area to you.

Q Mr. Nearburg, is your company prepared to go forward with the drilling and the testing of potential production out of the Morrow formation in the south half of 11 if the Commission should not approve the unorthodox location thereby allowing you to re-enter this well?

A No.

Q Are there economic reasons that cause you to reach that opinion?

A Yes.

Q Can you describe for us based upon your experience what you would anticipate the cost of a new well in the south half of 11 to be?

A Yes. Let me start with that by -- I've made quite a bit about the expense of building roads and locations in this area, as Florida understands. I believe their total well cost was in excess of a Million Dollars due to a lot of factors involving topography, lost circulation, and problems in drilling this area.

Q Nearburg participates and has an interest in the north half of this section as well as the south half, do you not?

A Yes, we do. We farmed out this acreage. We have an overriding payout and we have 40 percent of the Enron Well after payout.

In preparing our AFE I'd like to point

out that for road and location for a new well we only used $45,000. We know from our efforts in the past to try and explore Section 10, which we gave up on due to the cost, that we were looking there at one mile of road exceeding $60,000 in cost. We also know that Getty has given up operations on certain areas out here after spending a Quarter of a Million Dollars to build roads and locations and just giving up. These factors can't be overlooked.

In terms of re-entry we have dry hole costs of $242,140; completion costs of $236,920, for a total re-entry cost of a completed Morrow well, using the re-entry, of $479,060.

Q The re-entry cost is just short of Half a Million Dollars?

A Yes.

Q 479?

A Yes.

Q Would you -- have you made an analysis to tell us what you expect the total cost for a completed well if you were to drill from surface through the Morrow?

A Yes.

Q The AFE for a new well, dry hole cost is $463,663; completion costs of $242,720, for a total well cost of $706,383, which is 47 percent more than the re-entry, and I would point out that the new well AFE is very

conservative in terms of drilling problems that you encounter, which can be evidenced by the letter we have from the Commission, and does not take into consideration the full impact of the environmental cost.

Q Is Nearburg a working interest owners in the Enron Well? Is that a fair characterization?

A Until payout we're an overriding royalty owner, and then we are a working interest owner after payout.

Q As an owner in that well do you receive or are you entitled to receive information from the operator about the drilling, completion, and production from that well?

A Yes. We are to receive all the engineering information from the well, all geologic information, payout statements, cost of the well, monthly production reports.

Q Have you analyzed the production from that well to determine to what extent the operator of that well has received gross revenues from production?

A Yes. We've had an extremely difficult time obtaining information on this well from the three operators that have operated it, Florida, HNG, and now Enron. As I said, I believe the total well cost was in excess of a Million Dollars but less than a $1,100,000. We

have not received any payout statements. We received a check in March of 1988 for production from 1980 -- let's see, March of 1985 through January of 1987. Based on our royalty, that check was about $320. We blew that up to what the total revenue would be and it came out to about $42,000 for two and a half years worth of production.

Q From your perspective, Mr. Nearburg, do you have an opinion as to whether the unorthodox location should suffer a production penalty?

A It definitely should not, given the geologic and other factors in the area and the poor quality of the Enron Well and the general poor quality of the Morrow in the area.

As you will please recognize, the Morrow has never been or, in rare instances, has been the primary objective in this area. This has been a Cisco Canyon play.

Q With approval of the location that would allow you to re-enter the Cisco well without a penalty, is that a position that you propose the Examiner approve for your company?

A Yes.

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

We'd move the introduction of Exhibits -- all right, let me had you identify for the re-

cord Exhibits Seven and Eight. We have talked generally about them and we haven't specifically identified them, Mr. Nearburg. Take a moment and identify for me Exhibit Number Seven.

A Exhibit Number Seven will give you an idea of the complexity of drilling a well in this area, and it was not this way when Enron drilled their well, or at least not this burdensome.

This is the Application for Permit to Drill approved by the Federal Government for the re-entry.

Q Except for the Commission's Order approving the unorthodox location and the re-entry, have you completed and obtained approval from the BLM for the re-entry?

A Yes, we have.

Q That documentation is shown as Exhibit Number Seven?

A All right, when we turn to Exhibit Number Eight, Mr. Nearburg, what do we have here?

A Exhibit Number Eight is a land plat showing operating rights, ownership, in the area. It indicates the Enron proration unit in green with their well indicated by a green dot; the Nearburg proration unit in yellow, and our re-entry test well indicated by the red dot.

The ownership is all Federal. The east half east half of Section 11 is held in record title by (unclear) Shelby, however, the operating rights are vested in Nearburg and Enron.

The correlative rights should not be an issue here given this. I'd also like to point out that the distance between wells in this area could be as close as 1320 feet; that our actual distance between wells is over 2000 feet, it is 2000 and -- approximately 2,190 feet.

Q Direct your attention to Exhibit Number Nine. Did you provide the information to Mr Carr's office by which notice of this hearing was sent to the offset operators that might be affected by the application?

A Yes, Exhibit Ten is the affidavit and notice given to offset operators.

Q All right, that's Number Ten.

A Right.

Q Okay.

A Enron is included in that list.

Q All right, would you identify for me what is Exhibit Number Nine --

A Yes.

Q -- Mr. Nearburg? What is that?

A Exhibit Number Nine is the administrative approval of the Enron location. This approval is only

for the Cisco Canyon formation and did not include the Morrow formation or anything deeper, I believe, than the Cisco Canyon - Strawn.

Q Where did you obtain Exhibit Number Nine?

A This was obtained here at the Commission from their records.

Q And you reviewed those records and that was taken from Commission records?

A Yes. This was actually taken from the file that Florida had to drill the Enron Well.

MR. KELLAHIN: That concludes my examination of Mr. Nearburg, Mr. Stogner.

We would at this time now move the introduction of Exhibits Seven through Ten.

MR. STOGNER: Is there any objection?

Exhibits Seven through Ten will be admitted into evidence at this time.

Mr. Pearce, your witness.

MR. PEARCE: I don't have any questions for Mr. Nearburg, thank you, Mr. Examiner.

MR. STOGNER: I have no questions for Mr. Nearburg. He may be excused.

Mr. Pearce?

MR. PEARCE: Thank you, Mr. Examiner.

LARRY HASTINGS,

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

DIRECT EXAMINATION

BY MR. PEARCE:

Q For the record, sir, would you please state your name and employer?

A My name is Larry Hastings. I'm employed as a reservoir engineer by Enron Oil and Gas.

Q In which office are you located?

A I'm located in Midland, Texas.

Q Mr. Hastings, have you testified before the New Mexico Oil Conservation Division or one of its examiners previously?

A No, sir, I have not.

Q Would you briefly describe for the Examiner your educational background and work experience, please?

A My educational background was that I have a BS degree in industrial engineering. I have Masters degree in general engineering and I also just recently com-

pleted in engineering from the University of Texas in the Permian Basin out of Odessa.

My BS and Masters in engineering was from Texas Tech.

My work experience, I've been involved in the oil and gas industry for something like, oh, 18 years in various aspects in the industry, the last 8 of which I've been a reservoir engineer.

Q And for some period of time have you had some engineering responsibility for the area under consideration today?

A Yes, I have.

Q Are you familiar with this proceeding and the application of Nearburg Producing Company and what it's seeking today?

A I am.

MR. PEARCE: Mr. Examiner, I would tender Mr. Hastings as an expert in the field of petroleum engineering.

MR. STOGNER: Are there any objections?

MR. KELLAHIN: No objections.

MR. STOGNER: Mr. Hastings is so qualified.

MR. PEARCE: Thank you, Mr.

Examiner.

Q Mr. Hastings, state for us briefly why Enron is appearing in this matter.

A I would first like to state that Enron is not here to -- to prevent or keep Nearburg petroleum from re-entering this well that they propose to deepen. That's not been our objective at all. It's simply to protect our interest.

I would like to say that I find Mr. Mazzullo's geology very comprehensive and very impressive.

Mr. Nearburg's economics, we can appreciate the situation that he has with the economics. We had the same.

I also find that the problems with the payout status, and things like that, I can also appreciate that. I've got some of the same problems with our accounting people.

Again I will say it is our purpose to simply protect our working interest in the north half of Section 11.

Q All right, sir, in beginning let's look at what we have marked as Exhibit Number One to this proceeding and would you highlight the pertinent items of information on that exhibit for the Examiner, please?

A Exhibit Number One is simply just a

leasing fee map of the area surrounding Section 11 and it shows the producing wells in that area; the one primary well, of course, is the Enron Oil and Gas Chama Federal, which was originally the Florida Exploration Chama Federal.

It should be noted that Florida did receive a farmout from Nearburg and that Enron Oil and Gas has an interest in the north half of Section 11; at the present time it's 50 percent. They are also the operator of the Chama Federal.

Q And for identification there is a well shown in the south half of Section 11 in the northeast corner of that section. Is that the well that Nearburg proposes to re-enter?

A I take that to be the old McClellan Well that they wish to re-enter and deepen to the Morrow.

Q All right, sir, any other items on this exhibit?

A No, none.

Q All right, let's turn to what we've marked as Exhibit Number Two, please, and would you discuss that for the Examiner, please?

A Exhibit Number Two is simply a data table showing the wells in this area and what they produce, their location, what apparently is their status as we perceive from PI statements, their cumulative production as of

3-1-1988; their initial production dates, TD's, perforated intervals, and initial rates.

You'll notice at the top of that table we show, of course, the Chama Federal 11 No. 1, which has produced through -- through March, the 1st of March, excuse me, 3-1-88, 261-million cubic feet of gas. It initially came on line August 15th, 1985. It's produced in the Morrow or completed in the Morrow at 10,282 to 10,520 overall.

The other wells shown are the Shelby 12 No. 2, located in Section 12. From this table it appears that that well did test the Morrow but was recompleted in the Upper Penn and from the Upper Penn it has produced 6.2-million -- 6.2 BCF of gas and it appears right now it may be shut in. The last production PI reported was in November of 1987.

The third well shown is the McKittrick Hills Strawn Shelby Federal 13 No. 1, which appears to be just a shut-in or TA'd gas well that tested the Atoka and the Strawn, and did produce from both a slight amount.

Q Other items of particular significance at this point on Exhibit Two?

A No, none.

Q All right, sir. Mr. Hastings, turning to Exhibit Number Three, could you describe what's represented by this exhibit, please?

A First, let me say something about what we're trying to do here.

While I said earlier that we're not trying to prevent anyone from re-entering that well, we do feel that because it is a nonstandard location, and of course, it snuggles up close to the north half of Section 11, that Enron's working interest or the reserves in the north half of Section 11 could possibly be in jeopardy, and we are simply requesting that a production penalty be placed upon that well and the manner in which that production penalty be placed on that well is as follows, and it's simply to take the difference of the overlap of the areas of what a standard location, near standard location in the south half of Section 11 as compared to the 320-acre drainage circle of the proposed re-entry; take that overlap and create a fraction. That fraction is shown down at the bottom of that page; that fraction being 68 percent, that says that the unorthodox location would have 68 percent of what a standard location would have.

The next exhibit titled Well Location Variance Illustration is simply the differences in the north/south distances and in the east/west distances. Again this is a method that has been used this is a method that has been used by the Commission before to determine penalties.

We are finding here that the difference, the fraction difference between the nonstandard location and a standard location is simply 960 over 1980; that particular factor would be a 48, point 48.

The third factor would simply be the difference in the north/south distances. The unorthodox location is located 330 feet from the north proration line and the standard location would be located 660. That factor would be a point 5, and as approved by the Commission before, or used by the Commission before, a penalty would simply be the arithmetic average of those two -- three factors, in this case the factor would be a 5.55.

Q And that 55 percent under this calculation is your suggested allowable factor for the well rather than the penalty, is that correct?

A That is correct.

Q All right.

A This factor, allowable factor, could be applied to the deliverability of the well determined, for instance, twice a year.

Q Mr. Hastings, have you reviewed orders which the Commission has entered in the past dealing with penalties for unorthodox locations which crowd offsetting acreage and have you observed in those -- in some of those orders a minimum allowable set -- established for a well?

A Yes, sir, I have. In fact, let's just talk about the order number right now.

Q All right, sir.

A That order for a penalty was established --

(At this time a conversation off the record was had.)

A -- that Order number was R-7852, Application of Pennzoil Company for an unorthodox gas well location, Lea County, New Mexico.

In that order it states that the penalty on the allowable would be taking the arithmetic average of those factors previously stated; also said that there would be a minimum allowable allowed for this well. We are suggesting that this minimum allowable be simply, since this is a re-entry, the cost of the re-entry less the cost of drilling a new well, it simply be proportionately reduced from what was stated in that order, that R-7952, in proportion of the cost of the re-entry to the cost of the new well.

Q All right. And the Order R-7952 established a minimum allowable for the well involved in that case of 500 MCF a day, is that correct?

A That is correct.

A That is correct.

Q And what you're suggesting is taking the ratio of the Nearburg expected re-entry costs over the Nearburg expected new well completion costs, and reducing the minimum allowable set forth in Order R-7952 by that ratio. Is that correct?

A That is correct.

Q Have you looked at that order to determine whether or not it establishes special rules for establishing the deliverability of well -- of that well?

A That order said that the well would be tested twice a year in order to determine a deliverability; that there would be a 6-month balancing period for overage and underage from the allowable as determined by the test. Of course we've already alluded to the minimum allowable.

There also would be a minimum monthly production. If there was overproduction of the allowable this minimum monthly production would be allowed to prevent loss of lease.

Q All right, and do you believe that similar provisions could equitably be entered in an order resulting from this case to govern the operations and testing of the well in question?

A I do.

Q Do you believe that in order to protect

the correlative rights of Enron as an interest owner in the north half of Section 11, that it is necessary for a production penalty to be applied to the proposed Nearburg reentry in the south half of Section 11?

A I do believe that to be the case, yes.

Q And do you believe that the method for determining that allowable restriction set forth in Order R-7952 is an appropriate method to use in this case?

A I believe it to be very equitable.

Q Do you have anything further at this time, Mr. Hastings?

A No, sir.

MR. PEARCE: Mr. Examiner, at this time I think I might as well go ahead and mark Order R-7952 as an Exhibit Number Five and I would move the admission of Exhibits One through Five in this proceeding.

MR. STOGNER: Are there any objections?

MR. KELLAHIN: No objections.

MR. STOGNER: Exhibits One through Five will be admitted into evidence at this time.

MR. PEARCE: And I'll pass the witness, Mr. Examiner.

MR. STOGNER: Mr. Kellahin, your witness.

CROSS EXAMINATION

BY MR. KELLAHIN:

Q Mr. Hastings, the first production from the Enron Well was in the fall of 1985?

A According to my PI information that's what it was, yes.

Q Did Enron run any shut-in pressure tests from the date of completion to the date of this hearing?

A Not to my knowledge, no.

Q Do you know whether or not there have been any bottom hole pressure tests or surveys conducted on the well?

A To the best of my knowledge, other than an initial bottom hole pressure, possibly, and I'm not even certain of that, none whatsoever.

Q Were there any pressure build-up tests or analyses run on it, on the well?

A Again, I do not know. I don't believe so. Again, let me say this: This was a Florida Exploration well and the assimilation of the data information, the data that we received from Florida is not the best in the west.

Q You've looked at that information and there is no pressure information?

A There is one bottom hole pressure build-up in there but the date of that thing I don't know. I think it's an initial bottom hole pressure build-up.

Q And after Enron got the well, Enron has not run any pressure tests or (unclear).

A We have not, no.

Q Does the Florida Exploration file reflect any volumetric calculations on reserves for the well?

A No, sir, it does not.

Q And has Enron conducted any volumetric calculations to determine the reserves for the well?

A No, sir. What I have done is simply taken a rate/time production curve and estimated that the -- estimated from that rate/time production curve, we expect that well to have an ultimate recovery of approximately 1 BCF of gas.

Q Have you attempted to take that information and integrate it with any geology so you could see if that volume of gas is going to physically fit within the geologic interpretation for the reservoir assigned to that well?

A No, sir, I have not.

Q Have you made an attempt or has, to your knowledge, Florida Exploration made any attempt to calculate a drainage radius for the Enron Well?

A No, sir, they did not.

Q Has there been any type of reservoir study conducted by you or anyone under your direction with regards to the performance of this well in the Morrow reservoir?

A Other than examination of the rate/time curve, as I previously said, there has been no study made; simply have not had the time nor the personnel to do it.

Q What are the current rates of production on the well, Mr. Hastings?

A The current rates of production, and I'm doing this from memory, I believe in January it was approximately 14-million a month; February it was approximately the same thing, could have been -- could have been 13-million a month. Again I'm doing that from memory. Please --

Q Your rate/time analysis showed ultimate recovery of 1 BCF assigned to the well?

A Yes. That was as -- we do an annual reserve study; the rate/time analysis as of the 1-1-88 annual reserve study showed we had estimated ultimate recovery of 1 BCF.

Q And was that rate/time study based upon an abandonment pressure?

A No. Based upon an abandonment rate.

Q Okay, what is the abandonment rate that

you used?

A Generally we use, probably, 600 MCF per month as an abandonment rate. That's just simply a rule of thumb that we go by.

Q What was the time? What's the length of time in order to realize 1 BCF of production under this analysis?

A I do not remember.

Q When we look at the double circle on Exhibit Three, do you have one of those?

A Yes, somewhere. Okay.

Q The circles are intended to represent a 320-acre circle around each of the two choices of location, one being the unorthodox location and the other being the closest standard location, if you will.

A That's correct.

Q Is that what you have drawn?

A Yes.

Q Okay. When we look at the closest standard location and look at that 320-acre circle, there is -- there is -- I guess that's an assumed circular radial drainage of 320 acres, is there not?

A I cannot dispute that but it is something that the Commission had used before to determine penalties.

Q We don't have -- despite the existence of your well in the north half of 11, you've not provided us with any map of that reservoir as to its size and shape to see how well it matches the circle?

A No, sir, I have not. I consider it irrelevant to the question.

Q When we look at that first circle, there is an area by which, assuming radial drainage, that circle would extend into the north half of 11, isn't there?

A That is correct.

Q And when we go to the unorthodox location there is a second circle drawn.

A That is correct.

Q And within Section 11 there's a certain portion of that second circle that exceeds the first circle?

A Yes.

Q Do you see that ellipse there?

A Yes.

Q Have you planimetered that area to tell me how many acres are contained within that ellipse?

A Yes, we did.

Q And what is that?

A I have 108 acres.

Q Let me make sure you and I are talking

about the same thing.

A The ellipse, the area outside the proration unit.

Q Let's back up a couple of steps here.

A Okay.

Q When we look at the first circle at the standard location, there is an area that extends into the north half of 11 by a well drilled at that standard location, assuming radial drainage.

A Correct.

Q Have you planimetered what acres are for that half circle, if you will? It's not a full half circle. Do you see the area of encroachment --

A Would you please point that out to me?

Oh, no, I did not planimeter that.

Q Okay. When we look at the area in which the two circles overlap a common acreage, and that's got a diagonal line running through it, right?

A Right.

Q What is the acreage contained within that area?

A The acreage contained within that area, the overlap of the two circles, is 217.78 acres.

Q And that is 217 acres more or less, regardless of what spacing unit that it's in.

A Certainly.

Q Okay. Looking at the area in Section 12 and Section 11 in which the second circle exceeds the curve of the first, do you see that crescent shape?

A Right.

Q Have you planimetered that?

A That area was planimetered, yes. It's 108 acres.

Q 108 acres.

A If my math serves me properly, the --

Q All right, my question is --

A -- math here being simply 320 minus 217.78 should come out to be approximately 108.

Q All right. Have you attempted to planimeter that portion of the 108 acres that exceeds the first circle but that is still contained within the area of the north half of Section 11?

A No, sir.

Q Do you have, other than the initial potential on your well, to do you have any other deliverability test for your well?

A No, sir, I do not.

Q Have you --

A Excuse me, let me say this. I do have some rate/time curves on those two wells with me, should

you wish to have copies of those.

Q Do you have a copy of Mr. Nearburg's Exhibit Six where he's simply taken the reported production from your well? Let me get one for you, Mr. Hastings, if you don't have one.

A No, I do not have one.

Q When we look at the first page of that display, we're looking at the year 1985. I'm sorry, we're looking at 1987. Do you see the date up there in the upper --

A Yes, I see that.

Q -- righthand corner? When we're looking at 1987, this is the reported total production from the well for that year on a monthly basis and then it shows a cumulative in the far right?

A Which would be 84939 for '87, is that correct, or am I looking at the wrong page?

Q First page --

A First page, I'm sorry, going back to the first page. 236,163.

Q Yes, sir.

A All right.

Q That's about 647 MCF a day, is it not, sir?

A The 236 divided by 163?

Q Yeah.

A Or the 236,163 divided by the 365?

Q That will give us a daily rate, won't it?

A Yes, it will, and I'll accept whatever you come up with, that's fine.

Q When we look at the next page and December of '86, and we find the same well reported for the cumulative production for the entire year of '86, --

A 186,278?

Q Yes, sir.

A Okay.

Q You don't have any other information other than what's reported here on total production from the well?

A As to what?

Q As to whether this tabulation from the OCD files is in fact accurate.

A I have no questions as to whether it's accurate or not. I'm sure it is accurate.

Q When we look at the last page in '85 what do you find to be the total cumulative production from the well for 1985?

A 84939.

Q Have you examined or do you have an ex-

planation as to why the well, the Enron Well is being produced in the fashion as demonstrated on Exhibit Number Six?

A Market demand.

Q All right. What is the pressure of the well in terms of its ability to produce against the pipeline pressures, have you analyzed that?

A I do not have that information, no, sir. I consider it irrelevant to the purpose.

Q Do you know whether or not this well has the ability to produce against 100 pound pipeline pressure?

A I will have to assume that it probably does, yes.

Q Do you know at what pipeline pressure that this well is unable to produce against?

A I do not.

Q You have not analyzed any of the pipeline pressures in relation to the performance of this well?

A No, sir, I have not.

Q Do you have any geologic information available to you that is any different than what Mr. Mazzullo presented today?

A None, in the -- no, and as I stated before, I find Mr. Mazzullo's presentation very interesting.

Q Have you or Enron had an opportunity to

evaluate the perforations in this well to see if there are any more zones in this well that ought to be perforated?

A At the present time, no, we have not, simply due to the personnel and the time constraints.

I will say this, that Enron Oil and Gas is in the process of reviewing all of their production, producing properties, and checking things like that out.

Q How did you come to testify in this case, Mr. Hastings?

A I am the Division Reservoir Engineer for the Midland Division.

Q Do you have other engineers that work under your direction and control for the Midland Division?

A I have one engineer.

Q Do you have -- do you have other engineers that are over you in the Midland Division?

A That are over me I have the Operations Manager; a person by the name of George Thomas. He is over not only the Midland Division but also the operations as -- as I do cover the reservoir engineering work, of what we call our MidContinent Division, that covers Oklahoma and the Texas Panhandle.

Q Prior to preparation for your testimony today with regards to this application by Nearburg, have you otherwise studied the performance of the Enron Well?

A No, sir; have not had the time, the opportunity, enough information, even.

MR. KELLAHIN: No. further questions.

MR. STOGNER: Thank you, Mr. Kellahin.

Mr. Pearce, any rebuttal?

MR. PEARCE: No, sir, thank you.

MR. STOGNER: I have no questions for Mr. Hastings.

Does anybody else have any questions for this witness?

He may be excused.

Would either one of you like to call another witness at this time?

MR. PEARCE: No.

MR. KELLAHIN: I have nothing else.

MR. STOGNER: Mr. Pearce, I'll let you have the honors of giving the first closing statement and, Mr. Kellahin, you may follow him.

MR. PEARCE: Thank you, Mr. Examiner.

We're here on what Enron be-

lieves is a fairly straightforward matter. Mr. Nearburg proposes to re-enter a well at an unorthodox location which crowds the north half Section 11 in which Enron operates a well.

Mr. Mazzullo has indicated to us that he believes this is a highly complex area geologically. He has shown us a cross section which shows stringers appearing and disappearing. However, he's also shown us on his cross section the stringer which he believes might have been the best prospect and that that's stringer at 10,362 to 10,370. It is interesting to Enron that if we look at Mr. Mazzullo's cross section and the way he has colored in that particular stringer, he shows that particular stringer being continuous across the proposed location; he shows it thickening toward the proposed location.

It seems to me that that's an indication that at least on the basis of that geological evidence, that the well at the proposed location does in fact threaten to drain reserves from under the north half of Section 11.

Coming up with allowable restrictions in all unorthodox location cases is not easy. We have applied a test which the Division has previously used, which attempts to average three different factors.

In an effort to eliminate, I suppose, any skewing of results to keep one party from choosing one method of calculating allowable restriction over another, that's what averaging does. In this case the double circle calculation yields something on the order of a 32 percent penalty. The north/south footage penalty yields a 50 percent production factor, and the east/west factor yields about a 48 percent factor. The average of those three is about 55 percent.

Previously, when the Division has considered these cases they have recognized that in order to make allowance for necessary economics in operating oil and gas properties that some minimum allowable should be assigned.

In the order that we provided the Division that minimum allowable was set at 500 MCF per day. That was, as far as we can tell from the order, a proposal to drill a new well at an unorthodox location. It seems to us fair to reduce that minimum allowable to make allowance for the economies of re-entering an old well as opposed to drilling a new one and we therefore propose that the Division take that 500 MCF per day minimum allowable and reduce it by the ratio of the expected costs of re-entering and completion over costs of drilling a new well and completing a well.

The order which we exhibit -- which we admitted as Exhibit Number Five to this proceeding sets forth some special rules for deliverability testing and balancing and we think those rules are appropriate. We suggest that the adoption of a similar set of rules in this case with a minimum allowable as I have described it, and an allowable factor of 55 percent is the appropriate method to protect the correlative rights of those interest owners in the north half of Section 11.

Thank you.

MR. STOGNER: Thank you, Mr. Pearce.

Mr. Kellahin.

MR. KELLAHIN: Mr. Stogner, this case by Nearburg is a justifiable exception. There's no need for a penalty.

I appreciate Mr. Hastings difficulty with not having analyzed this reservoir, but the fact that he hasn't done his work shouldn't be construed as a penalty or justification for a penalty against Nearburg.

The implication of -- or the application of a double circle penalty, or location penalty as Mr. Hastings requests, is nothing more than arbitrary in this case. The only evidence presented to you shows you have a small, isolated Morrow stringer, the expectations of

which, that it drains very small areas. And yet we have Enron with a well that has been completed some 2-1/2 years ago and they don't have pressure information on it. They have not given us volumetric calculations. There is no justifiable basis by which you can conclude that they have an area of the reservoir that's going to be impacted by our well location.

I think it's absolutely arbitrary to adopt any of the proposals Mr. Pearce gives you in terms of a penalty.

The differences between the Pennzoil case and this case are as clear as night and day. You're welcome, and we invite you to look at the order you entered back in June of '85 and you can see very clearly the type of Atoka reservoir we are dealing with the Pennzoil case and the significantly different type of reservoir we're dealing with here.

I realize the Commission has utilized, and I certainly argue that you should utilize in the absence of information, some type of penalty in order to discourage operators from encroaching upon established, known production so that they can minimize their risk by placing themselves closer to the well. That closeology game ought to be discouraged, but this is not that type of creature. You can see from the topography that the

Nearburgs, if they wanted to locate this well anywhere else, topographically are precluded from doing so. Economically Mr. Nearburg has shown you that the re-entry, it's undisputed, in fact Mr. Hastings sympathizes with the economic plight of drilling expensive wells in this area for very minimal, risky reserves. It's unrealistic to expect that the economics are other than Mr. Nearburg tells you, that the only useful way, probable way, to extract the remaining reserves underneath our tract and to produce additional reserves out of a different Morrow interval that was not tested and is not known to produce in the Enron Well, is to drill a recompletion to re-enter this very well and that's an important factor.

We're not playing closeology. In fact, Mr. Mazzullo tells us that he is not at an advantage with his location; he's 125 feet down structure from the Enron Well. We have shown you the kind of erratic nature of the Morrow, the fact that the lateral discontinuity of the reservoir is extreme. There is no reason or justification to impose a penalty when we can see from Mr. Mazzullo's testimony that the Enron reservoir is so small that invoking a penalty on Nearburg does nothing more than discourage him from the re-entry and causing waste by precluding recovery of reserves that will not otherwise be recovered.

We appreciate your time this afternoon and we would request that you grant our application approving our location without a penalty.

MR. STOGNER: Thank you, Mr. Kellahin. Is there anything further in Case Number 9407 today?

If not, 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 (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. 9407.
heard by me on 20 July 1988.

Oil Conservation Division, Examiner