STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

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

APPLICATION OF NEARBURG EXPLORATION COMPANY FOR AN UNORTHODOX GAS WELL LOCATION, EDDY COUNTY, NEW MEXICO

CASE NO. 11,481

ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

April 18th, 1996

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID R. CATANACH, Hearing Examiner, on Thursday, April 18th, 1996, at the New Mexico Energy, Minerals and Natural Resources Department, Porter Hall, 2040 South Pacheco, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

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I N D E X

April 18th, 1996
Examiner Hearing
CASE NO. 11,481

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E X H I B I T S

Applicant's	Identified	Admitted
Exhibit 1	9	11
Exhibit 2	9	11
Exhibit 3	14	40
Exhibit 4	17	40
Exhibit 5	20	40
Exhibit 6	23	40
Certificate of Notice	11	11

* * *

Read and Stevens	Identified	Admitted
Exhibit 1	75	106
Exhibit 2	86, 89	106
Exhibit 3	86, 89	106
Exhibit 4	86, 89	106
Exhibit 5	86, 89	106
Exhibit 6	93, 96	106
Exhibit 7	93	106
Exhibit 8	93	106
Exhibit 9	103	106

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A P P E A R A N C E S

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* * *

WHEREUPON, the following proceedings were had at 8:45 a.m.:

EXAMINER CATANACH: We'll call the hearing to order this morning for Docket Number 12-96. We'll go over the docket later.

We'll go ahead and call at this time Case 11,481.

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

EXAMINER CATANACH: Are there appearances in this case?

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin and Kellahin, appearing on behalf of Nearburg Exploration Company. We are the Applicant in this case.

MR. PADILLA: Mr. Examiner, Ernest L. Padilla for Read and Stevens. I have two witnesses. I may only have one, but I may call two.

EXAMINER CATANACH: Any additional appearances?

Okay, will the witnesses please stand to be sworn in at this time?

(Thereupon, the witnesses were sworn.)

MR. KELLAHIN: Mr. Examiner, we're appearing today to obtain your approval for an unorthodox well location. Nearburg Exploration Company, as you know, has

an operating division, and they do business as Nearburg Producing Company. On behalf of that company, we're seeking approval to drill at an unorthodox location in the west half of Section 10.

You'll see on Exhibit 2, that we will discuss in a moment, that there is an existing Mallon-operated well in the east half of 10. The well in question, as well as the Read and Stevens well, which is located in the southeast quarter of Section 4, are both in what the Division designates the South Carlsbad-Morrow Gas Pool.

The Read and Stevens well is the subject of a Division order approving an unorthodox well location. It was heard by you on December 5th of 1991 in Case 10,419. And on February 12th, 1992, the Division entered Order R-9637, in which an unorthodox well location was approved for Read and Stevens. That well is located 1650 from the east line and 1150 from the south line. I have a copy of the order and I'll present that to you in a moment.

Read and Stevens' request for an unorthodox well location was based upon a combination of topographic and geologic reasons. They sought to be farther south to gain structural opportunity in their spacing unit.

Likewise, Nearburg is going to present you a geologic witness. Mr. Jerry Elger will testify with regards to the necessity for the Nearburg location. The

footage location on the Nearburg well is going to be 1330 from the north line and 990 from the west line.

As you know, the Commission amended deep gas standard well locations in February of this year. The standard location would have been 1650 from the north line, and we propose to be 1330.

Mr. Elger will demonstrate to you his reasons for that. There's a substantial risk that at a standard location this would not be productive in the Morrow, and it's his belief, and it will be his testimony, that there is a necessity for the unorthodox location.

We think if -- what if any encroachment exists is minimal and that no penalty is justified with regards to the approval of our Application.

Our first witness is Michael Gray to testify with regards to the ownership, and then we propose to call Mr. Elger to talk about the geologic components.

I have an engineering witness available. I don't intend to call him. We are unable to determine that there are petroleum engineering questions of significance, and so this is principally a geologic presentation that you're about to hear.

With that introduction, then, if there are no comments from Mr. Padilla, we're ready to proceed.

EXAMINER CATANACH: Mr. Padilla?

MR. PADILLA: Just by way of opening, Mr. Examiner, we obviously take a different position with regard to encroachment of this unorthodox location.

We believe, and our geological witness will testify, that a standard location is appropriate in this case, that they suffer no geologic risk. In fact, we will show that they sit higher structurally as a result of drilling on a standard location, and that no exception be allowed from the spacing-location regulations.

EXAMINER CATANACH: Okay.

Mr. Kellahin?

MICHAEL M. GRAY,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. For the record, Mr. Gray, would you please state your name and occupation?

A. Michael Gray. I'm senior landman for Nearburg Producing Company in Midland, Texas.

Q. On prior occasions, sir, have you testified and qualified as an expert in petroleum land management matters before the Division?

A. Yes, I have.

Q. Pursuant to your employment and in that capacity,

have you made a determination of the ownership within the area in question as we have identified it on both Nearburg Exhibits 1 and 2?

A. Yes, sir, I have.

Q. In your opinion, are the exhibits accurate and truly reflect the status of the working interest ownership within the area?

A. Yes, sir.

Q. Let's take a moment and have you identify for us, then, Exhibit Number 1.

A. Exhibit Number 1 is a locator map, a land plat, simply depicting the location of the proposed unit in the west half of Section 10, 24 South, 26 East, and the location of 1330 feet from the north line and 990 from the west line.

Q. Have you also provided to me a list of the working interest owners and operators within the area that is offsetting the west half of Section 10?

A. Yes, sir.

Q. And how did you prepare that information?

A. That was prepared from a check of the state, federal and county records by an independent landman to determine the ownership.

Q. And with that information and the search of Nearburg records, have you satisfied yourself that the

information shown on Exhibit Number 2, as well as the information shown on our notice of mailing and certificate of compliance with the notice requirements is true and correct?

A. Yes, sir.

MR. KELLAHIN: At this point, we tender Mr. Gray as an expert witness.

EXAMINER CATANACH: Mr. Gray is so qualified.

Q. (By Mr. Kellahin) For the proposed well in the west half of Section 10, Mr. Gray, have you a voluntary agreement with all the working interest owners for this well?

A. Yes, we do.

Q. And who would those interest owners be?

A. That would be Nearburg Exploration Company, Mallon Petroleum -- or Mallon -- excuse me, Mallon Oil Company, Diverse Group II, and Comet Petroleum Company.

Q. All right. Have you obtained the approval of all those parties for the drilling of this well?

A. Yes, we have.

Q. And do all those parties endorse and support the drilling of this well at its proposed unorthodox location?

A. Yes, they do.

Q. In terms of notification, we have an objection from Read and Stevens. Would you show us wherein lies

their spacing unit?

A. Read and Stevens' spacing unit lies in the east half of Section 4 of 24 South, 26 East.

Q. All right. And have any other parties, with regards to notification, filed any objection, other than Read and Stevens?

A. No, sir.

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

We move the introduction of Exhibits 1 and 2, plus the introduction of the certificate of notice.

EXAMINER CATANACH: Exhibits 1 and 2 will be admitted as evidence, and the certificate of notice.

Mr. Padilla?

MR. PADILLA: I don't have any questions of Mr. Gray.

MR. KELLAHIN: Mr. Examiner, we've called to the stand Jerry Elger. Mr. Elger has been previously sworn as a witness.

JERRY B. ELGER,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q. For the record, sir, would you please state your

name and occupation?

A. My name is Jerry Elger. I'm an exploration geologist for Nearburg Producing Company in Midland, Texas.

Q. Mr. Elger, on prior occasions have you testified before the Division and qualified as an expert witness in matters of petroleum geology?

A. Yes, I have.

Q. As part of your employment, have you been the principal geologist involved in determining where to locate a well for the appropriate development of potential Morrow production in the west half of Section 10?

A. Yes, I have.

Q. This is your project, is it not, sir?

A. Yes, it is.

Q. As part of your preparation, have you reviewed, read and analyzed not only the transcript but all the exhibits submitted by BTA when they obtained approval for what is now the Read-and-Stevens-operated well at an unorthodox location in the southeast quarter of Section 4?

A. Yes, I have.

Q. In addition, have you also analyzed all the appropriate logs and relevant geologic information within this immediate area?

A. Yes, I have.

Q. And based upon that review, have you now come to

certain geologic conclusions with regards to this proposed well location?

A. Yes, I have.

MR. KELLAHIN: We tender Mr. Elger as an expert petroleum geologist.

EXAMINER CATANACH: Any objection?

MR. PADILLA: No objection.

EXAMINER CATANACH: Mr. Elger is so qualified.

Q. (By Mr. Kellahin) Before we talk about the displays, Mr. Elger, give us a verbal summary of what it is that you have seen that has caused you to conclude the unorthodox well location for the Nearburg well is necessary.

A. There's two critical factors. The first factor is the need to be situated on a structure, and I believe that our proposed location in the northwest quarter of Section 10 will be on such a structure.

And there is -- In conjunction with that, there is also the need to encounter reservoir-quality sands, and I believe that my Exhibit Number 6 will demonstrate that as well.

Q. As you've analyzed the opportunity for the potential Morrow production in the west half of 10, generally tell us where we are within the entire Morrow interval that has realized the greatest opportunity, in

your opinion, for potential production in the west half of 10.

A. That unit would be the middle Morrow.

Q. Let's go back and have you start, then, with what is marked as Nearburg Exhibit Number 3 and have you identify that, and let's talk about the starting place of your presentation. What are we seeing with Exhibit Number 3?

A. This is a map that was prepared by a geologist with BTA Oil Producers, in their application for an unorthodox drill site in the southeast quarter of Section 4. It was Case Number 10,419 that was referred to earlier by Mr. Kellahin.

It's a structure map generated on the top of the lower Morrow, and it shows the proposed location at that time in the southeast quarter of 4, relative to the north-plunging nose of the Whites City Penn structure. They anticipated that their proposed structure would encounter the top of the lower Morrow and hence basically all of the Morrow sand sections on this structure, and hence would benefit from the gas -- all of the gas zones within the Morrow would then be -- or the reservoirs within the Morrow would be gas-bearing.

Q. Describe for us what BTA's geologist's argument was with regards to the necessity of having the BTA well at

an unorthodox location in the southern portion of its spacing unit.

A. That would maximize their position on this structure relative to where the contours run, and you can see a contour 8300 foot running basically east to west, bisecting Section 4 into a north and south half.

They had a number of cross-sections which are also displayed on this map in conjunction with this testimony, and the purpose of these cross-sections was to show, demonstrate, that as you advance off of the structure, you encounter quality reservoir sands, but they were -- the lower portion of the middle Morrow was -- those reservoir-quality sands were water-bearing.

And that includes a well in the northwest quarter of Section 4, it includes a well in the northwest quarter of Section 3, and it includes a well in the east half of Section 10.

Q. The BTA well, as now operated by Read and Stevens, has an east-half dedication to it, does it not?

A. Yes, it does.

Q. And so it is unorthodox as it moves to its southern boundary?

A. Yes, that's correct.

Q. What was their reason for not wanting to be farther north in relation to the C&K Allied Chemical well

in the northwest of 4 or the C&K Allied Chemical Number 2 well, I think, over in the northwest of 3?

A. They would have the risk of encountering the lower portion of the middle Morrow reservoir sands to be water bearing.

You would be moving into a structural position which would be flat to the well in the northwest quarter of Section 4 and the northwest quarter of Section 3.

Q. Do you agree with the conclusions with regards to what BTA testified to in terms of the structural position of their well in the east half of 4?

A. I agree with their conclusions in part, that that structure is of importance out here in terms of getting the lower portion of the middle Morrow sand section on the structure in order to be able to produce gas from it.

I do not agree with their conclusion that just structure is the only critical factor out here in terms of making a commercial well out of the Morrow.

Q. Did BTA submit any sand isopach maps of the middle Morrow?

A. No, they did not.

Q. It was simply cross-sections and this structure map?

A. That's correct.

Q. After they drilled the well, were the results of

that well consistent with where they thought they would be structurally, as shown on this map?

A. No, they were not.

Q. What happened?

A. If I could go to my Exhibit Number 4 --

Q. All right, let's do that.

A. -- and this is a map on the same structural horizon, the top of the lower Morrow, and it incorporates the new well control, meaning the BTA well in the southwest quarter of Section 4.

And what I've done is basically concurred with their structural interpretation, but I've revised this map to include that well top. What happened --

Q. The new data point, then, between the two maps is the result of having the geologic information on the BTA well in the southeast of 4?

A. Yes, that's correct.

Q. As a result of that well, what happened in terms of its structural position as expected on the BTA structure map?

A. That well encountered the top of the lower Morrow extremely low. If you refer back to Exhibit 3 and look at where they projected to encounter the top of the lower Morrow, it was somewhere above subsea of minus 8300 feet. And in fact, they encountered the top of the lower Morrow

at a minus -- below a minus 8440 subsea. So there was on the order of 100 feet structurally low to what was projected on their structure map.

Q. Let's look at that again. On their structure map, they are -- and I'm simply estimating -- they appear to be maybe 40 feet within the minus-8300 contour line. They're farther south of that contour line. So something in excess of minus 8300?

A. That's correct.

Q. Those contour lines are 100 foot apart.

And then as we move to your map, we actually find that the log reports them to be in the middle Morrow at minus 8441, so it appears to be maybe 160 feet low?

A. That's correct.

Q. All right. The result of that was what, sir? They are now in the middle Morrow, and they found sand, but it was water-bearing?

A. They found some sand that was gas-bearing, but they found the lower portion of the middle Morrow to be water-bearing.

Q. Was their testimony focused on the lower middle Morrow as being their primary objective?

A. It wasn't insofar as they didn't introduce any sand isopachs. Their whole -- If you read through the transcript of the testimony of the BTA geologist that

presented this hearing, it's riddled with the need to have -- to be structurally positive, their well location.

Q. Let's go now to your proposed location in the northwest of 10, and show us what you conclude in relation to your location, as opposed to where you would be structurally at the closest standard location for your well.

A. I believe that at our proposed location we would be situated on the same structural nose that BTA had originally projected across this area, but which has become significantly narrower because of their well top, and that the plunge of this anticline now is situated across the northwest portion of Section 10 and across a portion of Section 3.

Our well -- Projected top of the lower Morrow is at a subsea datum, which is just above the minus-8200-foot-subsea interval.

Q. And you're using what contours between --

A. This map incorporates 100-foot contour zones.

Q. You're using 100-foot contours. Okay.

You're requesting approval to move 320 feet farther north than the current rules provide?

A. Yes.

Q. If you move down to that standard location, then, it appears that you're going to fall on or slightly below

the minus-8200 contour line?

A. That's correct, slightly above the minus --

Q. Slightly above that 8200 line, all right.

Describe for me again the significance of having the additional data from the log of the BTA well and how it has provided an opportunity to further refine the contours of this structure as first presented by BTA.

A. Well, again, you can see a considerable difference in these two displays, just because of this new well information relative to this well.

The interpretation applied to this area by the BTA geologist had a rather sweeping nose that included all of the southeast quarter of Section 5, the south half of Section 4, and most of the south half of Section 3.

The new well top puts that -- takes -- wipes out basically all of the west portion of that structural nose and puts it in a -- actually a significant low.

Q. Let's take your Exhibit Number 4 as a reference map and now turn to the issue of the production of these wells.

Have you tabulated the production from the wells in this area?

A. Yes, I have, and that --

Q. Let's turn to Exhibit Number 5, then. Show us what dates you're using as the date by which you've posted

this information and what the daily rate is that's also shown.

A. Okay. This information is to September 1st of 1995, which I believe is the latest information which has been put out by the OCD for production records in New Mexico. So that is the date of the map.

Basically, you'll see by each wellbore three numbers -- well, three events.

The first, the top number, is the month and year of completion of that well.

The second number or middle number is the cumulative production from the Pennsylvanian Morrow formation, and that cumulative production, again, is to 9-95.

And then the last number, the bottom number, is the daily rate, based on the August information, what the wells were producing to sales then.

Q. The cumulative gas production volume is attributable to all the intervals within the Morrow --

A. Yes.

Q. -- for these wells?

A. Yes.

Q. Let's look at the productivity of the wells in relation to the Read and Stevens well. When you look north of their well, what has been the productivity of the well

in the northwest of 4?

A. That well, to my knowledge, has never produced any gas from the Morrow formation.

Q. Do you have a geologic explanation as to why that happened?

A. I think for the most part, the better -- the sands with the better porosity were water-bearing.

Q. Okay.

A. And again, that well is one that's on the cross-section that was part of the BTA testing in Case 10,419.

Q. As we move to the east, in the northwest of 3, what has been the productivity of that well in relation to production out of the Morrow?

A. That is -- that well is a -- considered to be -- has produced a cumulative of about three-quarters of a BCF of natural gas. The well is plugged or currently inactive and plugged, and we would consider three-quarters of a BCF to be very marginal reserves, considering the depth and the cost to drill to the depth to acquire that much reserves. So that's a very marginal well at best.

Q. That's production information and well data that was available to BTA at the time of their application?

A. Yes, uh-huh.

Q. What conclusions do you reach about that information in relation to why they ultimately moved south

of those wells?

A. They were trying to, again, get sands which were present in both of those wells at a structural advantage on a structural high, on a structural nose, and take advantage of the benefit of the structure.

Q. Let's turn to your Exhibit Number 6. If you'll take a moment and simply identify what we're seeing in Exhibit 6, it's a montage of several geologic displays. If you'll tell us what we're looking at, then we'll come back and discuss how you prepared this.

A. Okay. On the left portion of this montage are two log sections, two wellbores, the open-hole log portions across the Morrow of each of those wells, and I've identified those wells as being the key wells to this prospect.

Those wells show up on each of the maps on the right side with the little green hexagons or pentagons surrounding the wells, and one is the BTA well in Section 4, and the other one is the well drilled by Pennzoil, I believe, now operated by Mallon Oil, in the east half of Section 10.

Q. Separate and apart from simply illustrating these two wells on a cross-section for illustration purposes, you in fact have made correlations and examinations of all other relevant wells that help you build not only the

structure map, but the isopach?

A. Yes.

Q. When we go over to the bottom right, there is a plot, an isopach map, if you will, of what you've identified as the early middle Morrow. Describe for us what you're meaning with that nomenclature.

A. Okay, the middle Morrow section has been identified in that portion between the two -- the display of the two log sections. In fact, I've subdivided the Morrow, as most companies do, into three different units, an upper Morrow, a middle Morrow and a lower Morrow.

In some instances, and in the South Carlsbad-Whites City area, there are additional subdivisions of the Morrow which, due to the continuity of shale markers, you're able to make, and this is one of those areas.

And what I've done is subdivided the middle Morrow section and colored the late portion or upper portion of the middle Morrow a yellow on each of these log sections.

I've colored the lower sand package in the middle Morrow, or early middle Morrow package, orange on each of these log sections, so that you can have a sense as to the continuity of the sands within this local area.

Also, I've annotated these log sections as to where open-hole drill stem tests occurred, where production

tests were undertaken by the operators, and where the wells are currently producing natural gas from.

Q. When we move up to the upper right corner, there is an isopach display captioned "Late Middle Morrow".

A. That's correct.

Q. Summarize for us what interval you're relating to when we look at that isopach.

A. That isopach map is in reference to the sand which on both of those log sections has been colored yellow, and correspondingly the outline of several of the contour intervals has been shaded a yellow.

Additionally, each of the wells which is producing natural gas from this sand, which is perforated in this sand, producing natural gas, has been shaded orange on this display.

You can see that there's a well -- The well in Section 3, in the northwest quarter of Section 3, produced gas from this sand, the BTA well in Section 4 is producing gas from this sand, wells in 9 and 16, and then the key well over in the east half of Section 10 also produces natural gas from this sand.

Q. Has it been the practice of operators in this area, when they test for Morrow production, to eventually test most if not all of these Morrow intervals?

A. Yes, it is.

Q. Apart from that, do you have a concept in mind with regards to which portions represent the best opportunity for Nearburg at its location?

A. Yes, I do, and that is at the proposed location, the unorthodox location. You'll see -- And again, let me explain in a little more detail about the isopach of this particular sand.

What this represents is not a gross isopach, sand isopach. You'll see numbers displayed by each of the wellbores within this local area. What those numbers represent are the density porosity cutoff, using 8-percent cutoff, which I considered to be pay, over the top -- over the gross thickness of this yellow-shaded interval or late middle Morrow sand interval.

Q. Before we discuss the method, let me make sure I'm clear on the concept.

In addition to wanting to access as many of these Morrow reservoirs, if you will, the opportunity for Nearburg is focused primarily on what you've displayed here, the early middle Morrow and the late middle Morrow?

A. Yes.

Q. Okay. Let's go over, now, on the BTA Read and Stevens log, and let's start with the orange area and have you show me how that constitutes one of these separate little Morrow reservoirs which you have called the early

middle Morrow.

Why does that constitute its own separate little reservoir?

A. I believe it was part -- You can see that the porosity within that package is continuous, and I believe it represents one depositional event. Therefore, it would be a good unit to break out an isopach, so you can get a sense as to the geometry of what sort of depositional environment we might be looking at.

Q. All right, let's look at that orange area. If you look on the far right side, let's look at the porosity tracks.

A. Yes.

Q. What is occurring over there in the area that has the darker orange shading between the crossplots, if you will?

A. That is the separation of the density and neutron curves, which are an indicator -- which, when crossplotted, gives you basically the porosity, the true porosity of that particular sand unit.

Q. Okay. When you get up above that, into your next objective, which is the late middle Morrow, that's the area in yellow on that log. Again, when you look at the neutron and density plots, you have shaded using some different criteria. What are you doing here?

A. If I had used an 8-percent crossplot porosity cutoff for that particular wellbore when I generated an isopach, that well wouldn't have any pay section, or have basically no pay section.

You see the density curve -- The neutron curve is reading basically 1-percent porosity, the neutron curve -- I'm sorry, the neutron curve is reading about 1-percent porosity.

The density curve is reading somewhere on the order of 7- to 9-percent porosity.

And if you crossplot the two porosities to get the true porosity of that sand, you're reading about 6 percent, which is typically below the cutoff for productive reservoir in the Morrow.

Q. Is that appropriate geologic methodology when you analyze each of these reservoirs?

A. Yes, it is.

Q. Describe for me what is different about these two reservoirs that has required you to use different criteria in order to develop your isopach map.

A. The early middle Morrow sand has -- in my opinion, has better porosity, it has better permeability, and is therefore a better reservoir, capable -- you know, therefore, if you would encounter it gas-bearing, it would be capable of better rates.

Q. Okay. When you move into the next reservoir up, this late middle Morrow, if you'll use that same criteria as you had for the lower reservoir, then you would not have been able to generate an isopach map and therefore would not have any reliable way to show the distribution of that sand?

A. Yes.

Q. And why does that happen?

A. The permeability of the sand varies, the porosity of the sand varies, and it's probably in part due to -- Grain size can be one of the variables of it, and diagenetic plugging, diagenetic plugging of the primary porosity can be one of the -- There's a number of variabilities which are going to dictate why that particular sand is tighter relative to another sand.

Q. This upper, if you will, late middle Morrow reservoir, then, is a poorer reservoir than the early middle Morrow reservoir, the one just below it?

A. Yes, it is.

Q. When we move over to the next log on the cross-section you're now analyzing the Mallon well, which they operate down in the east half of 10, and lead us through the analysis of the log of that well.

Are you applying the same criteria in analyzing that log as you did to the Read and Stevens log?

A. Yes, I am.

Q. Show us what you've done.

A. Well, basically I've done the exact same thing I did for the BTA well: added up the total gross sand and acquired off of these open-hole log sections the total density porosity that equals or exceeds the 8-percent cutoff, applied those numbers to the map and contoured this, and the contour of the map is the display you see on the right.

Q. All right. Let's turn to the bottom right isopach. This is the one that has the 8-percent crossplot porosity cutoff?

A. That's correct.

Q. You've mapped the sand, and you have also imposed the structure map that we have seen, that you generated from your Exhibit Number 4?

A. Yes.

Q. Both of those geologic components displayed?

A. Right.

Q. Find your proposed location for us in 10 and show us how the combination of structure and reservoir thickness for that early middle Morrow combine and how it's affected your choice of location.

A. Okay. Again, this -- The structure map you see displayed is the same for both the late and the early

middle Morrow sands. These are structure maps on top of the lower Morrow, which I generated prior to receiving -- even receiving the BTA testimony, the exhibits from the BTA testimony for Case Number 10,419.

The structure map that you saw earlier on Exhibit Number 4 was generated only as it relates to a revision incorporating the BTA well. So therefore, there's a slight difference between that structural interpretation and the structural interpretation you see relative to these two isopachs. For all intents and purposes, they're the same structure. And the proposed location is situated on that component of that structural nose as it plunges off across 10 and 3.

Q. You also have some additional information that's important, and that is the demonstration of a gas-water contact in the early middle Morrow sand channel, if you will?

A. That's correct.

Q. Show us that contact, how it's been interpreted on this isopach, and then let me ask you some more questions.

A. Okay. Again, I would refer to the map legend adjacent to the title block for this map, and what you see are, wells that have been shaded blue have been production tested or drill stem tested to be water-bearing in this

particular sand. Those wells are both of the wells located in Section 4, the previous drilled Paloma well and the Read and Stevens well.

The well in the northwest quarter of Section 3 was production tested or drill stem tested to be water-bearing from this particular sand.

The well in the west half of Section 11 was determined to be water-bearing in this particular sand.

And the key well in the east half of Section 10, which again is part of the log montage, was production tested -- drill stem tested and production tested by Pennzoil, and it was determined that there was a gas flow of a million cubic feet of gas per day, plus a flow rate of two to four barrels of water per hour when this particular sand was production tested.

Q. All right. Let's look at this well some more. You know by log analysis that that well encountered the early middle Morrow at minus 8295, so that point is critical to you?

A. Yes, it is.

Q. Below the well symbol there, the top number is 26. That's your net feet using your cutoffs?

A. Yes.

Q. Yet you can find that it has a gross early middle Morrow thickness of 53 feet, the bottom number?

A. Yes.

Q. So we know that there's a sand package there, it has very high values on the net cutoffs, and yet produced water?

A. That's correct.

Q. What does that tell you about the relationship of the gas-water contact on structure with regards to that well?

A. It tells me that you have to -- in order to find this particular sand package to be gas-bearing, you have to be high to that subsea datum of 8295. In fact, you have to be -- and in fact, the projected proposed location, this particular -- in the northwest quarter of Section 10, would do that, would be -- would encounter this particular sand structurally high to the production tests in this Pennzoil well.

Q. As you move counterclockwise, follow the structure and the line that projects the gas-water contact, move around the nose of the structure and find the well in the northwest of 3. There again, under your criteria, it's got 25 feet of gross sand, 10 feet of net, and yet it produced water out of the same channel?

A. It's water-bearing, that's correct.

Q. And then we follow it around, and tell us what happened, then, on the BTA well that Read and Stevens now

operates.

A. That again is displayed on the log montage to the left. That particular sand was production tested, it was acidized, and it swabbed water with a very slight show of gas in a 24-hour period.

It was then abandoned. There was a bridge plug eventually set above this set of perforations, and there was never any gas produced from this sand. It was -- In my opinion, it was water-bearing.

Q. They hit the channel and they got 49 feet of gross, 21 feet of net, but they're too low on structure?

A. That's correct.

Q. How does affect -- Or what effect, if any, does your proposed location, then, have on the Read and Stevens well with regards to producing gas out of the early middle Morrow?

A. We have to be high to that well.

Q. And if you are high and successful, are you going to produce gas that might otherwise ever be produced by Read and Stevens out of their well?

A. I believe that's correct.

Q. That you would produce the gas, and they could not because they're too structurally low?

A. That's absolutely correct.

Q. All right. Do you see any reason for a penalty

with regards to production out of the early middle Morrow, if you are successful with your well at its location?

A. Not at all. Nobody else is producing from this particular sand unit, which appears to be a northwest-to-southeast-oriented channel. And it just so happens that that particular channel crosses the plunge of this Whites City Penn structure, anticline, and nobody to date has drilled a wellbore that penetrates where this sand is of reservoir quality on the structural nose and therefore developed the reserves of this particular reservoir.

Q. In your opinion, is this potential gas production out of the early middle Morrow gas that would otherwise be wasted if not produced at your location?

A. Yes, that's correct.

Q. No one else is going to get it, are they?

A. No.

Q. Can you utilize, Mr. Elger, this early middle Morrow sand isopach map as a productive-acreage map or an attempt to determine reservoir limits?

A. Not -- You can in some instances, but there are definitely anomalies to those instances. Again an 8-percent crossplot porosity was used in the generation of this early middle sand unit. I believe that the wells in 11, 10, 3, 4 all would have -- Had they been on the structure, the quality of the reservoir in those particular

wells would have produced commercial gas.

Q. One of the things the Division considers in addressing unorthodox well locations is the notion of, when it's available to them, to determine productive acreage within spacing units that are in question.

Is it reasonable to say we have sufficient geologic information in the early middle Morrow that we could come up with some kind of productive limits, mapped for penalty purposes?

A. I believe we can, yes.

Q. Is that true with the late middle Morrow?

A. It's not entirely true for the late middle Morrow, and if I refer again to this map, you'll see that there's a number of wells which meet the criteria that was utilized in the generation of this map that should have had -- apparently should have been gas-bearing.

The well in the east half of Section 3, the well in the northwest quarter of Section 4, the well in the south half of Section 5, all have porosity cutoffs well within the range of what appears to be productive in the wells that have perforated and produced gas from this sand.

And in a sense of just the gross sand thicknesses, the well that's displayed on this map that has the thickest sand, which is the well in the west half of Section 3, produced gas from this sand but was really

deemed to be not a commercial well or a very marginal well at best.

So to relate this isopach to some sort of a penalty accruing is really -- can't occur, I don't believe.

Q. Let me pursue that a little bit further. Would one of the reasons that the late middle Morrow isopach is not useful as a productive-limits map for penalty purposes [be] the fact the productivity of the wells are not directly related to thickness of reservoir?

A. Yes.

Q. Let's look at some examples of why that might be true.

When you look at the thickness of wells, which is the thickest -- the well with the greatest thickness in the late middle Morrow on your map?

A. That well is the west half of Section 3, gross thickness.

Q. It's got 68 feet of gross thickness, yet it only produced three-quarters of a BCF out of any of the Morrow?

A. That's correct.

Q. We go over in the northwest of 4, it's got 42 feet of gross thickness and it didn't produce anything?

A. That's correct.

Q. We go down to the Mallon well in the southeast of 10, it's got 35 feet of gross thickness, which is less than

the other two, and how did it produce?

A. It was a very good well. It produced nearly 3 BCF and is still a producer.

Q. Have the wells been completed and produced in such a way that you can allocate gas volumes back to these individual Morrow reservoirs?

A. No.

Q. Simply not possible, is it?

A. No.

Q. When we look at the Read and Stevens well in the southeast of 4, it is 48 feet. It's the well, I think on the map that's got the fifth highest thickness, if you will?

A. Yes.

Q. And how is it doing as a producer?

A. That's a good question, because it appears that from the production records the well was fairly marginal. At least the production records that we have, it indicated when the -- the timing between when this early middle package was production tested, and then a later sand in the upper portion of the Morrow which you'll see and labeled "upper Morrow sand" was added to the producing interval. Right now, the well seems to be a commercial well, out of the total perforated interval.

Q. When we look at your proposed location, in the

late middle Morrow map, what is your reasons for the location of that well at its unorthodox position over the closest standard location for your well?

A. To stay on the -- To stay on the structure as it's been defined on a subsurface basis, and to encounter what we would hope would be enough reservoir thickness to where we could have some reserves.

The same is true of the early middle Morrow. The need for the northerly move on this location is the fact that we would like to drill a well and produce the reserves from both of these sand packages.

Q. Well, let me ask you the question the other way around. Can you justify this well at a standard location for a single sand package?

A. I don't believe so.

Q. That's too risky for any operator, isn't it?

A. Yes.

Q. And you have to add the early middle Morrow in order to justify the risk?

A. That's correct.

Q. And that's the one that's got structure and water risk that are very significant?

A. That's correct.

Q. All right. Do you perceive that if the Division approves this unorthodox location that you have an unfair

competitive advantage over Read and Stevens for the reserves out of the Morrow?

A. No, not at all.

Q. Why not, sir?

A. Well, for one reason, their well was situated in an unorthodox location, encroaching to the south. Their well encountered a significant thickness of sand within the late middle Morrow package.

The projection at our proposed location is that we'll encounter this sand with some reservoir, but not nearly on a thickness basis equal to what was encountered by the Read and Stevens well.

And the simple fact that -- And the conservation of resources out here, we would like to get -- obtain the reserves from this early middle Morrow package, which, in our opinion, nobody is producing.

Q. Except for the duplication of the BTA exhibit, which is your Exhibit Number 3, do the rest of the displays represent your work product, Mr. Elger?

A. Yes, they do.

MR. KELLAHIN: Mr. Examiner, we move the introduction of Nearburg's Exhibits 3 through 6.

EXAMINER CATANACH: Exhibits 3 through 6 will be admitted as evidence.

MR. KELLAHIN: That concludes my direct

examination of Mr. Elger.

EXAMINER CATANACH: Mr. Padilla?

CROSS-EXAMINATION

BY MR. PADILLA:

Q. Mr. Elger -- Is it Elger or Elger?

A. Elger.

Q. Mr. Elger, do you have any plans to drill a well in the southwest quarter of Section 10?

A. In the where?

Q. Southwest quarter of Section 10.

A. Any plans to drill a well?

Q. Yes, sir.

A. No, sir.

Q. And you're absolutely sure of that?

A. Our Application is for an east -- a west-half unit of Section 10. This well would include that unit.

Q. I understand that. Do you have any plans to drill a second well in the west half of Section -- on a proration unit consisting of the west half of Section 10?

A. No.

Q. Mr. Elger, what has been your prior experience in this area?

A. You want me to go over the entire background, my entire background of experience?

Q. Well, in this immediate area. Does Nearburg have

any other wells in this immediate area?

A. I don't recall where the closest is. We do have an interest in some wells in the South Carlsbad field just a few miles north of this particular area.

Q. Have you been personally involved in the drilling of any other wells in the South Carlsbad-Morrow Pool?

A. Yes, I have.

Q. For whom?

A. Cities Service Oil and Gas Company.

Q. How long ago?

A. That would have been in the mid-Seventies.

Q. Is this the first prospect that you have developed for Nearburg in Section 10?

A. Section 10?

Q. Yes, sir.

A. Yes, it is.

Q. Have you developed any other prospects for Nearburg in the South Carlsbad-Morrow Pool?

A. Yes, I have.

Q. For Nearburg?

A. Yes, I have.

Q. When?

A. Well, if I'm understanding your question, have I generated -- You're not asking me whether they've been drilled yet or not; is that correct?

Q. Have they been drilled?

A. No.

Q. So this is your very first formal proposal for Nearburg --

A. -- for Nearburg.

Q. -- choosing the location --

A. That's correct.

Q. -- in the South Carlsbad Pool?

A. That's correct.

Q. Now, for Cities Service did you generate any well proposals in the immediate vicinity of this particular well in the South Carlsbad Pool?

A. Not that would fall on this particular map, no.

Q. Okay. Now, let me see if I understand your testimony. You first said that you had considered two critical factors, one having to do with structure, the other one having to do with the reservoir quality of the sands; is that fair?

A. That's correct.

Q. And let me understand your testimony. You are primarily interested in the middle Morrow, which you call the early Morrow, which is depicted as the yellow sands in your Exhibit Number 6?

A. The early middle Morrow or the lower portion of the middle Morrow would be the orange unit, genetic unit,

and the late middle Morrow would be the yellow.

Q. Orient me in terms of color as to what your primary prospect is. Is it yellow or orange or green?

A. Our primary objective is a combination of all three of those units.

Q. I understand that. My question was, you testified that you test all probable productive zones --

A. Yes.

Q. -- but what is your primary prospect here in terms of the color depicted on your Exhibit 6?

A. We believe that the reserve potential of the orange package, which is the early middle, is -- I would opt for it as being probably the primary objective on the basis of, I don't believe there's been any drainage that's occurred relative to this sand, and it should be encountered with -- I believe when it's encountered, it will be at or near original reservoir pressure.

Q. Now, in looking -- In terms of structure, looking at your exhibit -- your structure map, not the BTA structure map, you're saying that, as I understand it, in terms of structure, if you move that well to a standard location at 1650 from the north line, you're going to wind up being downdip?

A. Very little, yes, but slightly downdip to where we're proposing to drill.

Q. In terms of the contour line going through that exhibit, where would the well be located at a standard location?

A. Roughly subsea 8200 feet.

Q. Which is on that contour line depicted on that --

A. Yes, that would be very close to that subsea.

Q. Let me ask you, sir, why you have used 8 percent -- an 8-percent cutoff.

A. That's -- 8-percent cutoff with all of the various companies that I've worked with in the past, exploring for the Morrow, 8-percent cutoff has been kind of an industry standard, representing pay, in terms of whether you were going -- whether you were looking at -- relative to -- you know, if you could relate the net feet of pay and the 8-percent cutoff relative to your potential reserves generated when you drill the well.

Q. In looking at your Exhibit 6, explain to me the difference between the 8-percent cutoff on the isopach, on the yellow sand, and the isopach on the orange sand.

A. Okay. If I could refer again to the BTA log on the far left-hand side of this display, there are two curves which are typically displayed on an open-hole log, a porosity open-hole log. That's a neutron porosity and a density porosity.

The lower isopach map is a -- Now, neither one

represents what true porosity the reservoir is. The true porosity of the reservoir is typically a -- somewhere between what the density reads and what the neutron reads, and it's called a crossplot porosity. That is what the actual reservoir porosity typically is. Therefore, I used that as a cutoff on the early middle Morrow sand isopach.

The upper Morrow -- the late middle Morrow isopach, I used only a density porosity equal to or greater than 8-percent crossplot porosity, because a great number of the wells drilled out here don't have crossplot porosity equal to or greater than 8 percent. Therefore, I would have very little -- very little net feet of pay to map. And I wanted to find some criteria of determining what the geometry might be of the outlines of this particular sand.

Q. What would happen if you used a 5-percent cutoff?

A. This map would -- 5-percent crossplot or a 5-percent density --

Q. 5-percent --

A. -- or neutron density cutoff?

Q. -- crossplot?

A. I would have probably generated a map very similar to this map. The net effect would have been a very similar-shaped map.

Q. Would it --

A. You're saying if I had lowered my parameters --

Q. Yes.

A. -- for net feet of -- for what is considered pay?

Q. Right.

A. Yes.

Q. It would expand the area of --

A. Well, no, what I thought you asked was if I had gone to a 5-percent density porosity cutoff, if the map would have gotten larger.

Q. So --

A. You asked about crossplot porosity, so --

Q. Okay. If you went to a density cutoff --

A. -- then the map would have gotten bigger, that's correct.

Q. Now, let me ask you, relative to the well, the dryhole in the west half of Section 10, now, this well is 92 feet updip from your -- from the Mallon well, correct?

A. Yes, it is.

Q. In terms of cutoff porosity -- Well, let me ask this: What kind of porosity is on that well in terms of crossplot porosity?

A. Well, that well doesn't have a density neutron log available. The only porosity tool that was run in the open hole on that particular wellbore was an acoustic velocity log or a sonic log. Therefore, in order to get values, determined values -- In other words, a number of

these wells out here, in which there were no density neutron logs available, so the porosity determination of the acoustic velocity porosity was utilized, and that well happens to be one of those wells.

Q. Did water have anything to do with your determination in terms of, say -- Well, did that well have an 8-percent cutoff?

A. Well, I determined the acoustic-velocity porosity of the sands, and the values you see have been displayed on each of these maps.

That well, in my opinion, had no porosity cutoff in the late middle, 20 feet of gross sand, no porosity cutoff available in the early middle sand, and 32 feet of gross sand.

Q. Now, in using density porosity and crossplot porosity for both of these isopachs, isn't that using really apples and oranges in terms of analysis?

A. Not really. I mean, it's how accurate -- If you're asking me how accurate acoustic-velocity porosity is relative to density-neutron porosity, you know, I think you can arrive at the same values utilizing both.

There are a number of wells where -- I'm familiar with a number of wells where both porosity tools have been run, and the porosities -- the crossplot porosity has been analyzed in conjunction with the acoustic porosity, and you

can arrive at the same values using one or the other.

So I don't think it's an apples-and-oranges scenario.

Q. Well, you know, aren't you using these two different methods of showing porosity as a means of arriving at a conclusion that you want to portray?

A. Not at all.

Q. Now, going back to -- Well, let me ask, you seem to rely heavily on the BTA hearing, and as I understand, the BTA hearing was for the purpose of determining what?

A. Well, their application was for an unorthodox drill site encroaching the south line in a standup east half of Section 4 unit --

Q. Wasn't that --

A. -- and they were encroaching on the south line of that unit.

Q. Wasn't that originally a south-half proration unit?

A. I don't believe it was. I believe it was originally an east-half unit. The Application was for an east half. I'm not -- Do you know?

Q. You don't know whether it was the east half or the south half of the proration unit?

A. I believe it was east half.

MR. KELLAHIN: Mr. Examiner, here's the order.

It was a south-half originally, then it was turned.

THE WITNESS: Oh, okay.

Q. (By Mr. Padilla) Was the -- Do you know whether that unorthodox location was standard for a south-half proration unit, in terms of encroachment on lease line?

A. Your question is what, now? Say that again.

Q. Now, the unorthodox location, assuming that it was the south half -- and evidently it was a south-half proration unit -- the unorthodox location was to determine whether it ought to be located to the interior instead of to the outer boundaries of the south-half proration unit; isn't that right?

MR. KELLAHIN: I think the question is beyond the expertise of this geologist, Mr. Examiner. It looks like a regulatory issue concerning how the spacing unit is oriented.

It's currently on file as an east half. You can draw your own conclusion from how it was changed. The well is unorthodox under either orientation.

I'm not sure why this is a relevant question for this geologist.

EXAMINER CATANACH: It appears from the order, Mr. Padilla, that the well was encroaching toward the east line originally with a south-half dedication.

Q. (By Mr. Padilla) Okay. Apparently the witness

doesn't know; is that fair?

A. That's correct.

Q. Now, BTA abandoned this location after drilling the well, right?

A. I believe that's the history.

Q. And then Read and Stevens re-entered the wellbore and succeeded in production from the same wellbore?

A. To my knowledge, that's the sequence of events, based on what's on file with the OCD in Hobbs -- in Artesia.

Q. Mr. Elger, did the dryhole in the west half of Section 10 influence your decision at all in seeking to move further north?

A. Absolutely. That well, in my opinion, has no reservoir rock, has no parameters which, you know, meet the cutoffs for being reservoir -- having reservoir-quality rock in terms of feet of pay. And therefore, as you can see on each of these displays, it falls outside of the realm of each of the -- both the channel system as it's mapped, and for the early middle Morrow, and on the edge of the sand deposit I believe it's probably some sort of a deltaic sand lobe displayed for the late middle Morrow.

And in my opinion, that well is on the boundaries of each one of those particular genetic units.

Q. So then, are we talking about the limitation in

the reservoir size, the size of the reservoir?

A. Well, as to that wellbore, yes, we are.

Q. What did that wellbore test?

A. That wellbore tested -- My recollection is that a drill stem test or two drill stem tests were run across all of the middle portion of the Morrow, and there were some indicated gas flows from the sand, indicating they were -- the well was perhaps marginal to having some reservoir-quality sands.

But there was a notice of significant drawdown in the final shut-in pressures associated with those drill stem tests, indicating that you were looking at a reservoir rock that was again on a marginal situation relative to the sands that were drill stem tested, in terms of having a reservoir.

The election by C&K or Pennzoil, whoever drilled that well, was to abandon the wellbore. They felt like the test was conclusive enough to indicate that there was nonreservoir rock available in that wellbore.

Q. But that wellbore was -- Did that well test dry or wet?

A. There was no water, to my knowledge, recovered on any testing of the Morrow in that well.

Q. Now, the well on the west half of Section 3, do you know whether that well tested wet or whether the casing

collapsed in that?

A. To my knowledge, the late middle Morrow sand was productive. It was perforated, and the cumulative production of 700 or three-quarters of a BCF is attributable to that sand.

And production testing of the -- or drill stem testing of the early middle Morrow recovered -- basically it indicated that the sand was to be water-bearing at that location.

And again, that well is displayed on the BTA exhibits, and it's been annotated as to the drill stem tests and production tests.

Q. Did you personally examine the well record on that well?

A. Yes, I did.

MR. PADILLA: That's all I have, Mr. Examiner.

EXAMINER CATANACH: Mr. Kellahin?

MR. KELLAHIN: Just a couple points, Mr. Examiner.

REDIRECT EXAMINATION

BY MR. KELLAHIN:

Q. When you go back to your early middle Morrow isopach, Mr. Elger, in looking at Section 4 --

A. Yes.

Q. -- the size of the reservoir that could have

contributed to production out of the Read and Stevens well is affected by its relationship with the gas-water contact, right?

A. Well, that well did not produce any gas from this -- Are you talking about the early middle? Is that what --

Q. I'm talking about the early middle Morrow.

You have defined a reservoir shape that has certain sand values --

A. Yes.

Q. -- within the east half of Section 4?

A. Yes.

Q. The size of that reservoir that's able to contribute to production anywhere out of Section 4 is restricted by the oil-water -- the gas-water contact?

A. Yes, it is, and it's just a little piece smaller than 40 acres out of the southeast-southeast of that section.

Q. All right. When you look at the late middle Morrow, the ability to determine the size of the reservoir cannot be determined from this net sand isopach; is that not true?

A. That is true.

Q. And that's true because while there's a thickness component to the map, that is a tight, low-permeability reservoir which dramatically affects the productivity of

these wells?

A. That's correct.

Q. And there is no correlation between thickness or reservoir shape, to recoverable gas or productive acreage within a spacing unit?

A. That is correct.

MR. KELLAHIN: No further questions.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Elger, you've not discussed the upper middle Morrow sand. Is that in any way significant in your location?

A. Are you referring to the green sand?

Q. Yes, sir.

A. I don't believe it is. And I say that because every one of the sands that I've evaluated in this local area, there are no sands which have exclusively perforated that one sand, so you cannot determine the breakout of what the potential reserves of that sand are.

In all of the other instances of sands developed within this package of the Morrow, you more or less can get a sense as to what the potential of those particular units are.

But I think -- You know, if we look, for instance, at the well that's displayed on the log, on the

montage, the Pennzoil well, you can see that that little green unit is included in the perforations, and the production history of that wellbore. But when you look at the porosity relative to the porosity developed in the yellow zone, you can see that the late middle Morrow interval has much greater porosity, the density neutron is displaying gas effect. And in my opinion, the majority of the reserves, the nearly 4 BCF that's -- or 3 BCF that's been produced from that wellbore has been almost exclusively out of this yellow package, the late middle Morrow sand.

Q. Does that kind of -- same hold true for the upper Morrow sand, that you've also got colored in green?

A. Yes. There are some instances where that particular sand unit does produce only by itself. In fact, I believe there's a well in Section 8 that may be that well down in Section 8, which has produced 1.4 BCF, I believe has produced only from that particular upper Morrow unit.

Q. Have you identified a gas-water contact in the late middle Morrow zone?

A. No, I have not.

Q. Is it wet at all in that zone?

A. I don't know that it's wet on any wells that have encountered it on this map.

Q. How much structural position are you actually

gaining, moving to your proposed location from a standard location? An estimate?

A. Twenty feet.

Q. Okay. And you feel like that 20 feet is critical?

A. It's not nearly as critical as encountering the sands in the productive fairways as they've both been mapped. That's what I think is going to be the key factor, and that's the key reason for our Application here today.

Q. So structural would be secondary?

A. Structural would be secondary. The primary importance is the quality of sand reservoir encountered.

Q. In the late zone, how much net sand do you think you'd lose, moving to a standard location?

A. Ten feet of net pay. And the projected is less than 15 feet of net pay.

Q. Okay, that was in the late, did you say?

A. Yes.

Q. Okay. Now, are you going to -- according to your contour map here?

A. No, that's just an estimate.

Q. Does it appear --

A. We're at 13. If we move to orthodox, we might be down to -- It's really hard to predict, since there's no value for the well in the west half of Section 10.

We do have a five-foot contour that runs fairly close proximity. But the spacing of these contours is -- it's our best estimate as to where the spacing of these contours occurs, and it may be less than ten feet. It could be on the order of five to eight feet.

Q. Of loss?

A. Of loss, right. There would definitely be some loss.

Q. How about in the early zone?

A. I think it's more of a channelized deposit. I think the contours are more closely spaced.

Therefore, as you move to an orthodox location on this particular unit, you would be moving from reservoir to nonreservoir at a much greater rate than you would for the late sand. Therefore, I think ten would probably be -- ten feet would be...

Q. Do you feel like you know how much sand you need to encounter in each of these wells to be commercial? Do you have a handle on that at all?

A. No. That's a tough determination. You know, that's the risk of the prospect, and -- By situating the well at a standard location, you run the risk in both of these units, and -- that the -- The proposed location is economics-driven.

Would we make a -- You know, the determination of

where you would make a poor well versus where you would make a marginal well, versus where you would make a fair well, versus where you would make a good well, those are all factors that we look at in -- all relates back to how many total feet of net pay we have available for those drill sites.

And to say that if we moved it back to a standard location, whether we'd make a poor well or a marginal well or a good well, all we can do is relate it back to this geology prior to drilling and make some sort of determination as to what our risk is.

And we feel like a standard location would be, again, a situation where we'd be very marginally located in both of these sand bodies.

Q. Do you guys feel like the majority of your reserves are going to be produced from the early zone?

A. That's correct.

Q. Which is not being produced in the Read and Stevens well?

A. That's correct.

Q. Do you have an estimate on maybe what the ratio might be of that, the reserves?

A. No, I sure don't.

EXAMINER CATANACH: I have nothing further, Mr. Kellahin.

FURTHER EXAMINATION

BY MR. KELLAHIN:

Q. Have you and the engineer with Nearburg been able to use available data to calculate reserve potentials for the wells? It can't be done, can it?

A. No.

Q. We don't have the data available to do the answer to his question?

A. That's correct.

MR. KELLAHIN: Okay, nothing else.

EXAMINER CATANACH: This witness may be excused. Let's take ten.

(Thereupon, a recess was taken at 10:15 a.m.)

(The following proceedings had at 10:29 a.m.)

EXAMINER CATANACH: Okay, we'll call the hearing back to order at this time and turn it over to Mr. Padilla.

MR. KELLAHIN: One last small item, Mr. Examiner. We'd like you to take administrative notice of the well file for the Read and Stevens well.

EXAMINER CATANACH: Administrative notice will be taken of that well file.

MR. KELLAHIN: We'd like you also to take administrative notice of the transcript record and exhibits in the BTA case that dealt with that well. I've provided you a copy of the order, and I don't remember the case

number, but it's whatever's set forth in that --

EXAMINER CATANACH: Case Number 10,419, administrative notice will be taken of that.

MR. KELLAHIN: That completes our presentation.

MR. PADILLA: I don't understand the relevance of that as far as the geologic presentation. I'm not familiar with what that last file has to do with this case.

EXAMINER CATANACH: Mr. Kellahin?.

MR. KELLAHIN: The case file contains the geology and the information that Mr. Elger referred to, and it's relevant with regards to the other unorthodox well location within the affected area, and it's a well that's now operated by Read and Stevens, who have entered an objection.

I think it's relevant, Mr. Examiner.

MR. PADILLA: Your Honor, they drilled a dryhole, BTA drilled a dryhole to begin with. To the extent that the new information that may be extracted from the well file as to what zone is producing from the Read and Stevens well, I don't have any problem with that.

I have a problem with erroneous geologic information that may be contained in the BTA hearing file.

(Off the record)

EXAMINER CATANACH: I think we will take administrative notice of the case file, Mr. Padilla.

However, we'll temper it, we'll see -- I'll determine whether it's valid in this case or whether it's necessary.

MR. PADILLA: Well, as long as you understand my point in terms of whether -- We haven't seen it, we're not relying on that, and that hearing wound up with a dryhole.

EXAMINER CATANACH: I understand.

MR. PADILLA: To the extent that there may be geologic interpretations that were not correct, I don't think they're relevant.

EXAMINER CATANACH: I understand, and I'll take that into consideration.

JAMES P. BRANNIGAN,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. PADILLA:

Q. Mr. Brannigan, would you please state your name?

A. James Brannigan, James Patrick Brannigan.

Q. Mr. Brannigan, are you a -- Where do you live?

A. Roswell, New Mexico.

Q. And are you a consultant for Read and Stevens in this case?

A. Yes, I am.

Q. Mr. Brannigan, have you previously testified before the Oil Conservation Division and had your

credentials accepted as a matter of record as a petroleum geologist?

A. Yes, I have.

Q. Mr. Brannigan, have you prepared for this hearing certain exhibits, and have you familiarized yourself with the geology in the Morrow formation?

A. Yes, I have.

MR. PADILLA: Mr. Brannigan -- That's all I have. I tender Mr. Brannigan as an expert in petroleum geology.

EXAMINER CATANACH: Any objection?

MR. KELLAHIN: No objection.

EXAMINER CATANACH: Mr. Brannigan is so qualified.

Q. (By Mr. Padilla) Mr. Brannigan, first of all, I'd like to have you tell the Examiner of your experience in this general area, and particularly the South Carlsbad-Morrow Pool.

A. I started work in the South Carlsbad-Morrow Pool in approximately 1984 when I went to work for Read and Stevens. Read and Stevens has a substantial interest in the South Carlsbad area.

Also since then I've worked as a consulting geologist for Corinne Grace, who operates quite a few wells in the South Carlsbad trend.

I've worked this specific area, especially this

area in question, for the last seven years. When I was -- I started this when I was working as a consultant for a company out of Giddings, Texas, Bill Fenn, Inc.

Q. Mr. Brannigan, have you prepared geologic prospects and presented them to prospective operators in this area?

A. Yes, as a matter of fact, both the Read and Stevens Number 1 Crystal, which is producing approximately 1.3 to 1.4 million a day right now out of the Morrow, was my prospect that I originally sold to BTA, and I'll go into why we did the location that we picked. We didn't want it to be unorthodox, but I'll get into that in a minute.

I also sold the west half of Section 4 to an operator called Dan Snow out of Andrews, Texas, who has re-entered the well in the northwest quarter of Section 4, currently producing 350 to 400 MCF a day, water-free. That well had old logs run by C&K Petroleum. The well has since been relogged with modern LDT CNLs, dual lateral RXO, and had approximately 60 feet of reported sand pay, none of which was wet by log calculations.

Q. Mr. Brannigan, did you develop -- Well, you developed the BTA prospect and sold it to BTA; is that correct?

A. BTA was one of many operators in Midland and southeastern New Mexico that we showed it to.

Q. Did you show it to -- Well, BTA bought it?

A. Right.

Q. And BTA drilled the dryhole?

A. Right.

Q. What did you then do, next, with that prospect?

A. Well, actually before that, what happened was, originally, to go back to the beginning, the east half of Section 4 -- Actually all of Section 4 in this general area, which would encompass the south half of 23-26 and the north half or 24-26 was a prospect area that I was working up for Bill Fenn, Inc. Bill Fenn actually bought the east half of Section 4 at a federal sale.

We were in the process of trying to acquire the west half of Section 4 when a friend of mine, who is a consulting engineer out of Midland, Texas, by the name of Tom Bell, who owns a company called Fuel Products -- we got together and bought Bill Fenn out of the east half of Section 4.

We then got a farmout from -- which at the time was -- I think TXO had it, but TXO was taken over by Marathon. We then farmed in the west half of Section 4.

What we did then was, we went -- We had two standup federal proration units, two federal 320s. What we did then was, we, based on our geology, went to the Bureau of Land Management in Roswell, and I showed my geology to

Armando Lopez, who -- I'm not sure exactly what his title is now, or what his title was then. But he gave us approval to do a communitization agreement and lay down the -- do a laydown -- two laydown proration units instead of two standup proration units.

We then had originally --

Q. Wait a minute, you're going too fast --

A. Okay.

Q. -- for me, anyway. You had a south-half proration unit?

A. Exactly.

Q. Approved by Armando Lopez?

A. Approved by Armando Lopez.

Q. And that's when the BTA well was drilled?

A. Yes, but when we got the communitization agreement is when Tom and myself hit the streets and started trying to sell this prospect, of which Nearburg was one of the many people we showed this to and gave them our prospect brochure.

Q. And what in particular did you give Nearburg?

A. The entire well -- The entire package. There are eight -- Actually in this area, in the South Carlsbad Whites City Penn area, there are actually eight Morrow sands that can be delineated and mapped.

Now, one of the things you have to worry about

when you get down to the south, south of here in Section 9, you're actually in a Whites City Penn field. The only difference is, that's on a 640-acre proration unit instead of a 320.

Q. Mr. Brannigan, when you prepare a package for presentation to someone, do you also have estimated reserves?

A. Absolutely, you can never -- You can't put a prospect together. The first thing is the economics. It doesn't matter if the geology is correct; the economics have to be there. You always have to base your prospect on X amount of economics, based on X amount of dollars per MCF on the life of the well payout and return on investment.

Q. Did you listen to the geologic witness of Nearburg earlier this morning testify that they had no idea what kind of reserves they would encounter in their proposed location?

A. That struck me as very funny, because if you don't know what your economics are, why drill the well? Because you've got to know what your economics are. Your investors aren't in for pure science; they're in for return on investment. And you have to have -- You have to know your economics before you can drill your well.

Q. Let's go back to the history of the BTA proration unit. You testified you went out and hit the streets and

you sold it to BTA?

A. Yes.

Q. BTA drilled the well?

A. Yes.

Q. And where did -- where did their well bottom out, or what did they drill for?

A. For Morrow. We TD'd -- I don't know if we got actually into the top of the Mississippian, but we came pretty close. We tested all potential Morrow pays in the area.

Q. When you say "we", were you involved in the drilling of that well?

A. Yes, I was. I retained a small override. And I had access to the rig floor and was out there through the entire drilling of the Penn section, both from the -- from the Strawn all the way to TD. I never left the location except to go to Carlsbad to take a shower.

Q. Did you -- At what point did BTA abandon the well?

A. Well, what happened when we drilled the well, we were drilling down, and in this area, as most geologists and engineers know, you encounter the Wolfcamp formation. And the Wolfcamp out here can be high pressure, low volume. It can really eat you when you're drilling through it.

But we get into a pretty good Wolfcamp show. In

fact, we carried a 15- to 20-foot flare from the Wolfcamp all the way to TD.

BTA ran a drill stem test in the Wolfcamp, tested -- Oh, I'm not exactly sure, but I'm just going to say like a hundred and some barrels of oil a day and about a quarter to a half an MCF per day, with initial shut-in pressures -- Well, actually final shut-in pressure was about 400 or 500 pounds greater than initial. So we were all excited that maybe we got one of these stringer Wolfcamp zones that actually will be commercial.

So then from that point, we went on down and drilled through the Morrow. And like Mr. Elger from Nearburg Oil Company said, we were substantially lower in the drilling of the Number 1 Crystal than we had expected to be. But we also had encountered approximately 147 feet of porosity, using a 5-percent crossplot porosity cutoff.

Q. Why would you use 5 percent?

A. Well, I'm using 5-percent crossplot porosity cutoff just like Mr. Elger is in his yellow sand. When you use less than a 5-percent crossplot porosity cutoff, whether it's in the sonic or a neutron density, in this area -- I'm talking about the south end of the South Carlsbad or the Whites City Penn field -- Whites City Penn, again, is -- can be anywhere -- you look at some of the Whites City Penn; it could be 30, 40 BCF. Those are upper

Penn carbonates. So Pennsylvanian section, the Whites City Penn is all Pennsylvanian.

I'll give you an example. The two wells in the south half of Section 9, both drilled by C&K, both are now operated by a company out of Houston called W.A.D.I. Petroleum.

The Number 1 Pennzoil well is in the southeast quarter of Section 9. The well in the southwest quarter of Section 9 is the Number 2 Pennzoil well.

If you use anything less than a 5-percent crossplot porosity cutoff, you'll have less than five, maybe six feet of actual pay in those boreholes. Both of those wells had made over 4.5 BCF and are still currently producing.

Q. So --

A. What we have here --

Q. -- what are you trying to say by that?

A. What I'm trying to say here is that you can't just go ahead and say, Well, in the Lea area, Quail Ridge, Morrow in Lea County, where you would use a crossplot porosity cutoff of 12 percent, Buffalo Valley, Diamond Mound, Springer Basin, crossplot porosity of 8 to 10 percent, every one of these fields, you can't just go in and say the average person in southeast New Mexico uses an 8-percent crossplot porosity cutoff for the Morrow.

Every field has got its own characteristic, whether it's grain-size -- which I don't think it is in this case, because I saw all of these. We were pretty much a medium-grain sandstone through the entire Morrow section. The only section that had a coarse grain was that upper -- what I think he referred to as that upper green package that was perforated in the Crystal but he didn't have running down through his location. That was very coarse grain.

I think what we're looking at here is a really fractured, high-permeability, low-porosity sand, because when you look at a lot of these, a lot of these wells were logged and plugged, because the old operators looked at them and they said, whether it was a sonic or a count-rate neutron, and they said, 5-percent cross rate porosity, let's walk away from it.

A classic example of that is the well I sold to Dan Snow, northwest quarter of Section 4. That well was run by -- That well was drilled by C&K. It ran -- I don't remember if it was a sonic log or if it was a count-rate neutron. It had virtually no porosity.

We went ahead and ran regular logs, modern logs, LDT, CNL dual lateral RXO, and it all showed to be porous, it all showed to be pay. And Dan is currently producing, like I said, between 3.5 to 4 million -- 350 to 400 MCF a

day.

Q. Well, I think you've gotten a little bit ahead of where I wanted to be at this point. I do plan to show you later on the exhibits of Mr. Elger -- Elger, I'm sorry -- and have you talk about 5-percent, 8-percent cutoff porosity.

Let's go back and talk about what happened to the BTA well next.

A. Okay. We sold the deal to BTA. I then -- BTA bought the prospect from us. We had two laydown proration units. We wanted to drill a standard location, which at the time was 1980 from an east line, 660 from a south line, which was a standard laydown proration unit.

We then went out on location. I went out on location south of Carlsbad to this location, met with two BLM representatives, one being their land guy, the other one being an archeologist. We then waited for about 45 minutes to an hour for the BTA archeologist to show up.

Well, what I have here -- and I know it's not part of my exhibits, but this is the actual book I took out.

Our actual first location was right here.

Q. Which is --

A. We wanted to drill 1980 -- 1980 from the short line, 660 from the south line. But there's a little ridge

up in here, and the Bureau of Land Management wouldn't let us go ahead and drill that for two reasons: one, topographic reasons; and the other reason is, this highway that goes from Carlsbad to the Carlsbad Caverns has been deemed by somebody in Denver as a scenic byway, and they didn't want somebody from New York City who is going to be visiting the Carlsbad Caverns to have a heart attack when they saw a drilling rig polluting their view of southeast New Mexico.

So we then went through a series of -- If you can see my dots, there's seven locations that we tried to pick before we actually came up with our location that we drilled. It was based on topography and archeology.

Our actual location would actually -- Our proposed location would have been farther south than it was and farther west than it was. We ended up drilling this because the archeologist told us where we could drill, or the BLM land people, who said you can't drill on the side of the hill because you're going to have to cut too much of the hill out, and it's going to scar the mountain, or the knoll, whatever that is out there.

So where we ended up drilling the Crystal well, which I have since found out a standard location is not 1980 from the short line; it's now 1650. Then, since the Crystal well is 1150 from the south line, 1650 from an east

line, the 1650, based on a laydown proration unit, would be standard anyway. And we're actually farther north than we could have been, being 660 from the south line, if you follow my reasoning.

Q. Okay.

A. Not -- Back then it was 1980. Now it's, I guess, 1650 as of what? February or March?

So we are actually more than standard. We're actually farther away from the Nearburg acreage, based on the new ruling.

Q. Tell us now about going back in the well, the re-entry portion of that well.

A. Well, let me go back actually, even before that, back to BTA, because I think this is really important.

BTA, when -- We went ahead and we drilled through the Morrow section with BTA. We were about 200 feet low structurally to where we thought we would be.

We ran electric logs, and there was actually one part of that -- of a sand that calculated wet. The rest of it, we ran our -- And that also showed to be partially depleted. It showed to be 1700-and-some-odd pounds based on an RFT.

That particular zone also produced to the south in those two C&K wells -- excuse me, the two W.A.D.I. wells, now, the Number 1 and Number 2 Pennzoil. That

calculates wet. That was about 90-percent water.

Now, we had a total using a 5-percent crossplot porosity on the Crystal, 147 feet of potential pay.

Q. Now, you're talking -- you said you were -- You were talking about a sand. What particular sand is this?

A. It's the sand that Mr. Elger was talking about earlier. He calls it -- Well, I'm not sure what he calls it, but I don't want to confuse his nomenclature with mine.

I tried to get a little bit easier, and I'm saying -- What I'm calling it on my cross-section would be Sand Number C.

Q. You're referring now to your Exhibit Number 1?

A. Yes, I am.

Q. Identify that map for the Examiner.

A. This is a cross-section that I did that goes through from the Read and Stevens Number 1 Crystal, down to the well to the south, the Pennzoil Number -- the W.A.D.I. Number 2 Pennzoil, to the two locations.

Now I found out this morning that the standard location wouldn't be 1980; actually orthodox is 1650 from the north line.

But it doesn't change my geology and it doesn't change my interpretation, because when I show you my sands, I'm going to show you that not only do you gain porosity when you move to the south, but you also gain structure

when you move to the south. Whether you go all the way down to 1980 from the north line or 1650 from the north line doesn't matter. The better location is the farthest away from that north line.

It then goes through the dryhole in the southwest of Section 10, down to the producing Mallon well in the southeast of Section 10.

Q. Okay. Now, I want to take you back to when you said a sand on the BTA well. Which sand are you talking about when you look at your cross-section?

A. Let me -- I'm talking about sand number -- or letter C.

Q. Okay.

A. But let me point out something to you about sand C, if I might.

If you look at sand C on the Read and Stevens well on the west side of the cross-section, the left side of the cross-section, just in sand C now, you'll see two sets of perforations, the upper one being a perforated higher porosity, and the second lower set being actually a crossplot porosity of about 5 percent.

Now, when you take that sand, which the "C" sand is producing in the W.A.D.I. wells in the south, the lower set of perforations in that "C" sand don't exist. That sand, that tight sand, does not exist in the W.A.D.I. wells

to the south.

Now, that's the main sand. The sand that we're talking about now is the main sand that Nearburg said they're going for in their proposed location.

But what happens when you move to the north, into the Read and Stevens well, you gain the bottom part of that tight sand. When you go to the well in the northwest of Section 3, you lose that higher porosity altogether, and you just keep that lower tight sand.

Now, the reason why that's important is because we feel at Read and Stevens that we have another location to drill to get the lower sands that were perforated and messed up by BTA, and I want to get to that in a minute too.

In other words what I'm saying is, the wet sand that's in the Read and Stevens well, which is dry in the C&K wells, doesn't exist when you drill 1980 from a south line, 660 from an east line of Section 4, which would be a standard location now that we've got a standup proration unit.

So we want -- have to have the election at some point in the future to be able to drill another well in the southeast quarter of Section 4 to be able to go after the sands that BTA screwed up.

Now, if you'll look at the --

Q. Okay, now, now -- You're addressing the point that Mr. Elger said that, as I recall --

A. -- that we'll never be able to -- that Read and Stevens will never -- is not producing out of that sand and never will.

And I'm saying that we will be able to produce, because the sand -- Let me show you here. I don't know if this is orthodox or not, but what I'm talking about is -- See, this is the "C" sand. This sand here, this part of it, produces to the south in the W.A.D.I. wells. This does not exist. When you go to the north, you lose this and just pick up this, which calculates water-free.

So what I'm saying is that we could drill a well eventually on an orthodox standup proration unit here to encounter not this wet sand but just this sand right here, that exists in this borehole right here.

Now, Mr. Elger also talked about the well in the southwest of Section 3 being a marginal well, only made three-quarters of a BCF. The well was producing economical amounts of gas when the casing collapsed in the Wolfcamp.

We tried to re-enter that well. We -- Well, I say we tried. We went and pulled all the records, and we felt that -- I think it was Enstar, who operated the well at the time, did everything possible to get by that collapsed casing, and they couldn't. And they did the

right thing by abandoning the well.

The well would probably still be producing; it was on a flat-line decline. But the casing collapsed. Who knows what it would have made? Sure, three-quarters of a BCF is not economical, but 2 BCF might have been if that's what it cum'd out at the end of its life.

Q. Mr. Elger said that well was wet. Is that true?

A. I don't believe so. It wasn't producing any water out of -- It wasn't producing any water out of the sand it was producing from.

Q. So would that throw his gas-water line off?

A. I think so, because you have to be careful what you look at -- what he's calling this -- What he's calling my "C" sand could actually be differentiated into two sands, just what I was talking about right now, the upper porosity and lower porosity.

The upper porosity, I agree with him, is wet, the upper porosity. The lower porosity is not. It's water-free. And that's where Read and Stevens at some point will drill a location 1980 -- a standard standup location, orthodox, 1980 from a south line, 660 from an east line.

So they -- By BTA drilling their -- I mean by Nearburg drilling their unorthodox location, they will be draining our location.

Q. And that goes to correlative rights?

A. Exactly.

Q. Mr. Brannigan, where are we now in terms of the history of the BTA well?

A. What happened was, BTA -- Let me go back to the cross-section too and show you -- There's two different-color perforations. There's pink perforations which are currently -- which are producing horizons. The blue perforations were perforations that were attempted, but they never -- but they weren't able to produce anything. So the blues are shows, the pinks are actually producing.

BTA, in their infinite wisdom -- I can't figure this out -- went in and perforated a wet sand. And I agree with Mr. Elger, that sand never should have been perforated in the Read and Stevens -- in the BTA well. But the perforation below it, which is the sand at around 11,788 to -95, that sand calculates water-free.

That sand, by the way, by itself in some of these wells -- on some of my isopachs I've shown these -- that sand by itself has produced over a billion and a half cubic feet. But when BTA perforated this and they got water, they kept in the back of their head, they said, Man, we've got this DST in the Wolfcamp that looked great.

So they never perforated any of the things that Read and Stevens is currently producing out of. They went up to the Wolfcamp and, in classic Wolfcamp style, came on

about a million and a half a day, 150 barrels of condensate and, you know, two days later it wasn't doing anything. That well, I want to say, made less than 2000 barrels, maybe 3000, but I don't believe it made 3000 barrels.

BTA then contacted us, Tom Bell and myself, along with the other people that had interests in the well. They said, We're going to plug the well; do you want it? Primary lease I don't think was up at the time. They said, We're going to plug the well.

Tom Bell and I elected to buy the wellbore from BTA. We then went back to a series of companies, one of which was Les Honeyman over at Nearburg, to show them the sands that we had and why we think we had potential pay in the Morrow. We ended up going to Read and Stevens. Everybody said the same thing: BTA is a gas producer, they're not stupid, they're not going to walk away from pay. And that's right, because BTA does -- most of their production is gas.

So we had a hard time reselling this re-entry. Charlie Read took it because he's been working this area for -- South Carlsbad area, for the last umpteen years that he's been in southeast New Mexico, at least 12, when I went to work for him in the --

Q. Charlie Read is the Read of Read and Stevens?

A. Yes, he is. And he's also a reservoir engineer.

Q. Okay.

A. He saw this as potential. What we tried to do -- And I'm not an engineer, and I don't remember the history behind it and engineering to me -- I -- you know, I just -- it's hard enough for me to know about geology, let alone engineering. But I do know what he tried to do was go back in and squeeze out that water zone.

We tried to squeeze it off and go back in and open up some of these other zones that BTA had opened up, trying to get commercial gas out of known stratigraphic producers in the area. But we couldn't because we couldn't keep the water off of it. That zone should never have been opened up in the BTA well.

So then what Read and Stevens did is, they set a cast iron bridge plug, came up, hit the two sets of lower perforations, the well came in -- I'm not sure what I put CAOF for, because CAOFs are actually useless. But the well came in and it produced about 700 MCF a day.

And then what they did is, they came up to the upper sand, the upper pink perforation, and perforated it, set an on/off tool between the two sets of perforations. The well is currently making about, on any given day, 1.2 to 1.5 million a day, water-free.

Q. Can you measure the individual production from this zone separately?

A. Yes, you can, because there are enough wells in this trend that have produced out of only one or possibly two sands at different times to be able to get a handle and say, this sand with this amount of feet of pay will produce X amount of gas.

Mr. Elger talked about the well in the southeast of Section 8 -- yes, of Section 8. That well made about a billion and a half cubic feet, only out of the upper sand that Read and Stevens is producing out of right now.

There are numerous wells out here. If you go back in and look at the well history where people have started at the bottom and went ahead and perforated intervals and got commercial production and then at a later date came up, either plugged back or opened up different holes. Again, I'm not an engineer, but I think after X amount of months of production you can be able to extrapolate what total cumulative production might be. Again, I'm not an engineer. I don't even know enough to be dangerous.

But to answer your question, there are enough individual sands out here that have been perforated by themselves to where you can get a handle on what a sand will produce.

Q. Now, let me ask you, what other efforts have you made to re-enter other wells in this area as you did the

BTA well?

A. Well, like I said before, since we have sold the deal to Read and Stevens to re-enter the Crystal, we sold the well in the northwest quarter of Section 4 to Dan Snow. Dan has re-entered that well, again ran modern logs. All the sands calculate water-free. He's currently producing, like I said, 350 to 400 MCF a day.

As we speak right now, Corinne Grace is completing a well in Section 6 of 23-26, the Number 1 Cueva State. She's got Gene Lee out there right now, an engineer out of Roswell that's completing that well.

On the table as we speak too, also in the west half of Section 10 of 23-26, I sold Read and Stevens a re-entry of an old Ralph Lowe well that we are currently -- Monday I was in Tulsa, trying to sell that prospect for Read and Stevens.

I have a lot of -- I've done a dissertation worth of work just in these two townships in the last six years, because we were looking for behind-pipe reserves in some of these wells, because some of the wells, even if they produced economic amounts of gas, left pay behind pipe, because nobody's ever thought 5-percent crossplot porosity would pay.

If you look at the lot of these logs, you could say, Well, that looks like a cherty limestone, and that's

why you've got the low porosities. But I'm here to tell you that if you do your homework and look at these sands, pull the sands and look at them, look at the electric logs, that 5-percent crossplot porosity will pay. And I'll take any well out here in this trend --

Q. Have you tried to acquire the dryhole in the west half of Section 10?

A. Yes, we have, Tom Bell and I. Tom especially has been the lead man in talking with Mallon in their Denver office for the last two or three years, to try to acquire either through purchase or farmout, to re-enter the dryhole in the southwest of Section 10.

Q. In your opinion, is there any -- should that dryhole influence a move of the proposed location of Nearburg further north?

A. I think it should propose a location farther south.

Q. Okay, let's get back now to your cross-section and have you finish the explanation of that, or have you already done that?

A. Well, all I want to say about the cross-section is that I differentiated -- There are, again, 8 different pay sands in the South Carlsbad Whites City Penn area in this -- and I'm not talking about -- South Carlsbad field goes two or three townships to the north. My experience is

not to the northern stuff, where Cities has a lot of their production, but I'm talking about right here, in this area, where your crossplot porosities are low.

I've differentiated just four sands for this hearing, because there's only four sands that I think go through the Read and Stevens acreage and the Nearburg acreage. I've just named them "A", "B", "C", and "D" sand. And I also have isopach maps that correlate with them.

Q. Let's look at your isopach maps and have you identify those, please.

A. Okay. Well, I have four isopach maps, "A", "B", "C" and "D". I'm using a 5-percent crossplot porosity cutoff.

Now, if you go to Mr. Elger's work on his yellow sand where he's using an 8-percent density cutoff --

Q. Let me hand you that exhibit so that you can refer to it as we go along. It's this Exhibit Number 6.

A. Okay, Exhibit Number 6 is late middle Morrow yellow net sand isopach map. He uses a crossplot porosity for his orange sand and uses a density porosity for his yellow sand.

Well, the reason he's using that, as far as I can tell, is because if you crossplot you're not going to have any pay in your yellow sand. But how can your yellow sand produce if it doesn't have any pay?

So when you look at what he does in the yellow sand, he gives the Read and Stevens well, using an 8-percent density cutoff, he gives it 20 feet of pay.

Well, look at the yellow -- Look at the Read and Stevens Crystal well. There's not one density spike there that's even -- you know, you've got -- I don't even think you've got 20 feet of density at 8 percent.

But when you crossplot the neutron, which is reading zero, with the density, which is reading -- let's just say all eight -- you've got a 4-percent crossplot porosity. But yet we know when we perforated this well, the Read and Stevens well by itself, was making 600 to 700 million a day. So it is pay at 5-percent crossplot porosity. That's what he's using here for his yellow. He's calling it 8-percent density, but it's a 5-percent crossplot.

Q. He uses 8 percent in the crossplot, and the other isopach?

A. Right, which I still think is low, and I'll tell you why.

All these sands out here that I've worked for years, if you went ahead and said this well has made 5 BCF and give it an 8-percent crossplot porosity, you're going to find wells that don't have any pay.

He gives zero feet of pay -- I'm talking about

this orange sand -- he's giving zero feet of pay in the well in the southwest quarter of Section 10, but yet they ran two DSTs over that interval. The first one was 1.1 million a day, the second one was 1.7 million a day.

Now, granted there was drawdown between initial and final shut-in pressures. But you've got zero feet of pay, and it's making 1.7 million a day? No way. You've got to lower your parameters. You can't say it's an 8-percent; you've got to go a 5-percent. Then you've got pay. Does that make sense?

Because if you go with the zero feet of pay and the DST is making 1.7 million a day, something is wrong. Either they drill stem tested the wrong interval, or you've got to come down on your parameters for your porosity cutoff. And that's what I've done, 5 percent.

I sold this prospect to BTA, one of the largest gas producers in southeast New Mexico, on a 5-percent crossplot porosity. None of those guys doubted that 5 percent was it.

Read and Stevens bought this thing. Read and Stevens, again, one of the largest gas producers -- When I worked for Read and Stevens they were the 21st largest -- out of almost 700 operators they were like in the high teens, low twenties as far as gas production in southeastern New Mexico. 5 percent is what they use out

here. BTA's is 5 percent. I use 5 percent. Use higher than that, you don't have any pay.

And again, getting back to that well in the southwest of 10, 1.1 out of one DST, 1.7 out of another DST, with no pay? I -- I don't know, I don't get it.

Q. Okay, let's go on to your isopachs, and show us what those show. Does each isopach relate to each of your -- to the "A", "B", "C" and "D" sand?

A. Yes, they do. And there's a couple things I want to point out if I can.

One is that what I have down is an orthodox location. Again, it's 1980 from the short line. Whether it's 1980 or 1650, again, I'm going to be able to show that your porosity thickens and your structural position is higher, whether you go 1650, 1980 or 2310.

Q. You plotted this locations based on the old rules?

A. Yes, I did.

And another thing too, Ernie. On my maps I have actually three different colors. On all my maps red is the -- what I call orthodox at 1980. And whether it's yellow or green, that would be their proposed location.

Now, the reason for the difference in colors, Roswell had a little power outage the other day, and when I ran out of green arrows all the stores were shut down so I

had to go change my color to yellow.

But yellow and green will be the same; that will be their proposed location.

Q. Okay. In terms of the "A" sand, what does your "A" isopach show?

A. My "A" isopach map shows that in the Read and Stevens Crystal well we've got 18 feet of crossplot porosity of 5 percent.

Since then we now have another control point with a modern log, which is the Dan Snow Number 1 Aspen in the northwest quarter of Section 4.

What it's showing is that these trends are channels coming down through our location -- That sand, by the way, does not exist in the northwest of Section 3, but we've got it in the northwest of 4, the southeast of 4. They also had 10 feet of it in the dryhole in the southwest of 10 and 8 feet in the southeast of Section 10.

So what essentially I'm doing is, by changing the crossplot porosity cutoffs from 8 to 5 percent, what you're doing is, you shift your channels, not to the north, to get closeology to the Read and Stevens well; you use true geology and start moving it to the south, because you've got a better parameter, a better handle on porosities.

Q. Is that apparent on all of your isopachs?

A. Yes, it is, all of my isopach maps are based on a

5-percent crossplot porosity cutoff, and what it's showing in every one of the sands, "A", "B", "C" and "D", every one of the sands shows that you're thickening as you move to the south.

The only reason I see to move to the north in the northwest of Section 10 is that eventually -- What you're going to do is, you're going to drain Read and Stevens' acreage, because they talked about only -- that the only -- they're talking about the orange sand not currently producing in the Read and Stevens well. Currently not producing.

Well, what if they get -- What if they encounter seven of those other sands that I've mapped in this area? Are they not going to produce from those because they'll drain Read and Stevens' acreage?

Q. Are you taking the -- The Nearburg orange sand, as Mr. Elger has shown, do you plan to go back into -- and produce --

A. Not in the borehole, but we reserve the right to drill an orthodox location in Section 4, going for that lower water-free interval in the orange sand, yes.

Q. And that is the one that's shown on the bottom lower portion of your cross-section on the Read and Stevens well?

A. That would be -- his orange -- His orange sand

would be the "C" sand on my nomenclature.

Q. Okay. But on your cross-section, the Number 1 well, as I understand your testimony, the -- Let's see. On your "D" sand, the lowermost perforation, was that water?

A. Water-free.

Q. Water-free?

A. Water-free. I'm -- Log calculations. We were never able to adequately test it, because that interval -- BTA started upside-down. They took their best porosity, which was the water zone, popped it and got some water. Then they came down and tried to perforate it.

Q. The two blue perforations above that?

A. Yes, those are the first -- those are the first sets that they hit, right.

Q. And so -- so in effect, the --

A. Once they got water, there was no -- we couldn't -- there was nothing we can do --

Q. Okay.

A. -- to the lower sands.

Q. You've got to drill another well, is what you're saying?

A. We've got to get -- Right, exactly.

Q. Do you have anything further on the isopachs?

A. Well, just -- Like I said, every one of the isopach maps that I've done, you can actually see that the

channels thicken to the south. There must have been -- South of their location, there was some reason for a fairway that all these sands came down through there. Not just the two that they've mapped, but also the other eight are -- the four that I've got mapped and the other four that are in the area, there are definite trends in fairways that these channels go through.

Q. Mr. Brannigan, you've also prepared two structure maps. Please identify those and tell us what they show.

A. Well, the first structure map, which is Exhibit 7, is a structure map done on top of the Morrow marker, which is the datum on my cross-section.

I also -- Exhibit Number 8 is a structure I did on top of the Atoka. The reason I did the top-of-the-Atoka structure map is because in this area, especially in the Whites City Penn, unless you pull actual logs and look at perforations, you can't differentiate between Morrow, Atoka, Cisco, Strawn, because it's all based under just Whites City Penn. In fact, the discovery well for the Whites City Penn was a Cisco -- was a Strawn well that Gulf drilled.

So the reason I did that is because there is a chance that you can stumble into an Atoka zone or a Strawn zone out here. But what it's also showing, whether you're in the Morrow -- my structure maps, whether you're in the

Morrow or in the Atoka, the structure -- you've got these lows coming down from the south, coming up on the Whites City Penn high, but whether you're in the Atoka or whether you're in the Morrow, you gain structure as you move south from their proposed location, whether it's 1650 from the north line or whether it's 1980 from the north line, or whether it's -- or whether it's 2310. You're gaining structure as you move to the south.

By the way, these maps of the Atoka and my Morrow map are just small segments of a big regional area that I've mapped. I'm talking possibly 12 to 15 townships. This was not just mapped to just try to show that they're drilling in a hole. I cut these out of an existing map. This low, whether it's in the Atoka or the Morrow, this low extends all the way to the north up almost through the Carlsbad Airport acreage.

It's also -- I don't like to use it, but it's also mapped basically this way on the Geomaps, which I don't put a lot of weight in except for a quick look.

But I feel that structurally you're moving -- And even on his structure map he's only gaining about -- what, 20 feet by moving south? It's not going to make or break you by going 300 and some feet to the south.

The biggest question we have here are where are those sands going? And if you use an 8-percent porosity

cutoff, it's too misleading. It's too misleading because you've got zero feet of pay in a well that DST'd 1.7 million. You've got to go down to a 5-percent.

When you go down to a 5-percent crossplot porosity cutoff, what it then does is takes this zero contour, zero foot right here, in the dryhole --

Q. And you're looking at his --

A. -- southwest of Section 10.

Q. Right.

A. What it does then, was, it gives it 21 feet, so that what it does is shifts this whole channel over.

Again, zero feet of pay on a DST 1.7 million? No way. But you get a 5-percent porosity cutoff and you've got your pay, and you go from zero to 20-some feet, boom, there goes the channel. And that's the way --

Q. That's the way your isopach goes?

A. That's the way I've got it. That's the way I've got it down here. Honoring that point shifts that channel from the axis of the channel being here to the axis of the channel being here.

Q. About how much further west?

A. Quarter of a mile, at least.

Q. In terms of location of the Nearburg proposed well, what is your conclusion?

A. They drill -- I'll tell you what. If they

drilled the orthodox location, I would invest in it. Because they've got a better chance of picking up two more sands that they're not going to be able to get, possibly, by drilling their location. I would put my money on an orthodox location.

Like I said, for the last three or four years, Tom Bell and myself have been attempting to purchase the west half of Section 10 to re-enter that dryhole. So I am willing to put my money where my mouth is, because to a consultant time is money, and I've been working on it for three years.

Q. Mr. Brannigan, we missed one Exhibit. I think it's Exhibit 5.

A. Exhibit 5?

Q. It's this --

A. Six.

Q. Well, it's not marked. Exhibit 6.

A. Okay. Now, this is going to be -- this is going to change a little bit. What this was is when I thought the location, orthodox, was 1980 from the north. Going 1980 from the north, you get X amount of feet of porosity, 125 feet, where if you drilled their orthodox location which is -- or unorthodox, where they want to drill 1330, they're only going to get 97 feet of pay.

Now, granted they're not going to go that full

650 feet down to the south. They don't have to anymore; they just have to go 350. But what it's going to show is that whether they pick up an additional 65 feet -- Maybe by only going 350 feet down to the south -- I'd have to go back and look at my maps -- maybe they only pick up an additional 40 feet, 35 feet. But it's still more pay than they will by drilling their unorthodox location.

Structure maps are different. Mine is a lot more optimistic for them to drill orthodox than it is to drill unorthodox. But even based on their geology, they're only gaining 20 feet by moving to an orthodox location.

If I'm right, they're going to gain -- they're going to gain -- or excuse me, they're going to gain 28 -- they're not -- I said 65 feet of pay. They're actually going to -- by moving to 1980, they're going to gain 28 feet. Maybe by only going 1650 they may only gain 15 feet of sand.

But 15 feet of sand, we had talked to you earlier, there was that one well -- The C&K well in the southeast of Section 8 had less than 15-percent crossplot -- 15-percent porosity, based on a 5-percent crossplot, and that well made a billion and a half cubic feet.

So what I'm saying is that, okay, you gain 15 feet by drilling orthodox. Fifteen feet will get you a B and a half. You have to do your economics, you have to

know your -- you have to know your reservoir.

Q. Is it fair to say that your major difference with Mr. Elger is -- Well, let me ask you this way: Summarize your major differences with Mr. Elger, as far as structure is concerned.

A. I have the nose -- He has the high -- he has the high coming in through the north, farther north than I do. He has the structure, the Whites City Penn structure, coming up here. And I'm saying that with the Read and Stevens well, it changes everything.

I would have agreed with him before we drilled the Read and Stevens well. I mean, I was getting phone calls every ten minutes from BTA: Got to be at the lower Morrow marker, got to be there.

Well, we weren't. We had all these great drilling breaks that we could correlate with the C&K well, the W.A.D.I. wells to the south, and we were 200-some feet lower than we thought we were going to be.

What that did was, it took this high and moved it farther south. But then when it brought this low in, it brings this low in here.

Q. And that's because of the Read and Stevens well?

A. Right, right.

Q. In terms of thickness, what is your difference between you and Mr. Elger, sand packages?

A. Well, the sand packages, you've got to start -- you've got to start with the premise that we're using a different crossplot porosity cutoff.

I would probably have maybe the same kind of situation that he had if I used an 8-percent crossplot, because if I gave the well in the southwest -- If the well in the southwest of Section 10 didn't run a drill stem test and I didn't do any other homework out here except to say that the average Morrow field uses an 8-percent crossplot porosity cutoff, I probably would have moved my channels to the north like he did too.

But when you do your studies out here and find that wells have made 4 and 5 BCF from crossplot porosities of 5 percent, and you've got a well that DST'd 1.7 million a day, you've got to honor that point, you've got to honor that control point.

Now, one thing it will do for Nearburg by drilling farther to the north, it will allow them at some future time to drill a well in the southwest of Section 10. I know it's all speculation, but by drilling an orthodox location going 1650 from the north line, they're going to drain more to the south than they would by going to 1330 from the north line, which would give them more reserves if they opt at some point to drill in the southwest quarter.

Because I can almost guarantee you that the

southwest quarter of Section 10 is going to be drilled through the Morrow, because we've got a good drill stem test, we don't have the charts, we don't really know what the -- Without the charts on the DST, you really can't tell were the wells shut in long enough to build up? Maybe they were, maybe they weren't.

You can say, Well, those guys weren't stupid, they wouldn't -- C&K wouldn't abandon a well that was potentially gas. Well, they did. The Dan Snow Number 1 Aspen, C&K plugged that one, and we're making commercial gas out of it right now.

Q. So it's all on 5-percent porosity, essentially?

A. It was either on 5-percent porosity or it was based on economics at the time. In 1970 --

Q. What you --

A. In 1970 --

Q. What you know today.

A. It's economical. What we know today is, 5-percent porosity is economical.

I'm in the process right now of trying to sell a well for Read and Stevens. There's a well that was drilled by Charlie Read in 1977. It was the Number 1 -- Read and Stevens Number 1 Sanders State. They had a 15-foot Strawn sand and a 25-foot Morrow sand.

Direct offset to them was the Ralph Lowe Number 1

Moots. It's made 2-point-something BCF out of the Strawn sand. I asked Charlie -- I bought the lease from Siete and from Mark McClellan, McClellan Oil and Gas. I went to Charlie and I said, Why did you plug the well?

He said, Man, he said, We expected to see the big, fat Morrow-Buffalo Valley pay, and all we got was, you know, about 20 feet of Morrow and about -- and we had the 15 feet of Strawn. And he said, The economics at the time were 32 cents an MCF.

So now what I did, I bought the wellbore from McClellan, and guess what I did. I just sold it to Read and Stevens. They bought their own dryhole. Because economics have changed from 1970s to what they are now.

BTA plugged that well, heck of a well. I mean, one and a half million a day is not too shabby. Dan Snow, we re-entered the C&K dryhole. 400,000 isn't much to write home about, but it's a commercial well at two dollars an MCF, you know, it's making him some money.

Besides that, he's only producing out of one sand. He's got the rest of the sands that he's doing things -- We were talking about earlier, about being able to figure out how much each one of these sands will make? Dan Snow has got around 50 feet or 60 feet of total pay. He only has 15 feet open at the time.

C&K, in my opinion, at least -- I've been working

it for three years -- plugged the producing well in the southwest of Section 10.

And I'm here to tell you that I've put my time trying to buy that wellbore to re-enter it. Because I've had success with Corinne Grace re-entering, I've had success with Dan Snow out here, I had success with Read and Stevens. And when I'm, you know, comparing apples with apples, that C&K well is a commercial well, based on today's economics.

Q. Mr. Brannigan, let me show you Nearburg's Exhibit Number 5 and have you -- and ask you if you have any comments on that exhibit.

A. Well, yes, I do. They said that the well -- Mr. Elger said that the well in the northwest quarter of Section 4 did not produce because it was all wet.

Well, I'm here to tell you, I'm getting override run checks every month, not on water but on gas delivery from the Number 1 Aspen, on Dan Snow's well. When we ran modern logs, that well is producing water-free.

The other thing too was, he said that the well in the northwest of Section 3 at three-quarters of a BCF was noncommercial. It was producing economical amounts of gas when the casing collapsed in the Wolfcamp.

The company -- I believe it was Enstar, I'm not sure, maybe he's got down here C&K, Union, Texas -- Whoever

the operator was at the time, tried to go back in, milled out that -- what they had to do, they couldn't get back in that borehole. They tried to go back in and get that well producing.

When the casing collapsed, they didn't just walk away from it saying, This is a doggy well. They worked and they spent money trying to get back in that borehole because it was producing economical amounts of gas.

So three-quarters of a BCF is not economical, but God only knows what that thing would have produced if it was -- if the casing didn't collapse on it.

Again, the Wolfcamp out here, high pressure, low volume. Maybe they had a problem with their casing after a few years and that Wolfcamp just came and grabbed them. You know, we had some high-pressure stuff on our BTA well in the Wolfcamp.

Q. Mr. Brannigan, let me -- Would you identify what we've marked as Exhibit Number 9?

A. Exhibit Number 9, what we did at Read and Stevens when we got this unorthodox location, we didn't want to be the only kids on the block saying that we're against Nearburg drilling their unorthodox location, so what we did was, we sent out letters to all the working interest people, overriding royalty people in the Crystal well, along with Dan Snow, who does not have an interest in the

Crystal but has an interest in the west half of Section 4.

So we're here today as not just representing Read and Stevens; we're representing the other working interest people and overriding royalty people and Dan Snow in this hearing.

Apache couldn't be here today, for problems, but they're one of the ones that signed it and said they didn't want -- they don't approve of this location, along with the other people that we have here.

Q. Mr. Brannigan, in your opinion is the proposed location necessary for Nearburg to produce their fair share of hydrocarbons in the -- in Section 10?

A. My personal opinion after working this area, this specific area, for 12 years, is that they're going to have a better sand package, sand development, and also be structurally updip by drilling their orthodox 1650 from a north-line location than they will if they drill their 1330 well, in my opinion.

Q. Can we conclude from that, that the unorthodox-location request is unnecessary?

A. I believe it is. I believe that the reason why they're drilling this well, in my -- again, in my personal opinion, is that by moving farther to the north in their proration unit, they're going to drain Read and Stevens, not their lease in the southwest section of Section 10, and

that at some point in the future, based on crossplot porosities of 5 percent, or whatever parameter they want to use, they're going to go back one day and they're going to say, Man, that C&K well tested 1.7 million cubic feet of gas a day; maybe that southwest quarter doesn't look too shabby. And if we drill as far north as we can, we're not going to be draining our own acreage. They're going to be coming into our correlative rights, draining our acreage, not their acreage to the south, based on my isopach maps.

Q. Mr. Brannigan, do you have anything further to add to your testimony?

A. Just that in my opinion -- and like I said, I've worked this area quite a bit, I've been trying to pick up the west half of Section 10 -- that I really believe I'm not -- I'm not here just to be a mercenary. I'm here to tell you that I really believe that to drill an unorthodox location serves no purpose but to drain Read and Stevens' acreage, because I know for a fact Nearburg is going to encounter more than just their orange sand, which they say does not produce and will never produce in our wellbore, in our location.

But I'm here to tell you that they're going to encounter more than that sand, possibly seven more sands, and if they're -- if they tell us that they'd never perforate anything but that orange sand, then maybe we

could change our minds about letting them drill their location. But I'm here to tell you they're going to get more than just that orange sand.

MR. PADILLA: Mr. Examiner, we offer Exhibits 1 through 9.

EXAMINER CATANACH: Exhibits 1 through 9 will be admitted as evidence.

Mr. Kellahin?

MR. KELLAHIN: My turn?

EXAMINER CATANACH: Your turn.

MR. KELLAHIN: Thank you.

CROSS-EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Brannigan, I'd like to break this down into some little pieces, and if you'll help me stay focused on the little pieces I will attempt the best I can to ask you direct questions that will give you a full opportunity for a concise answer.

Let's see if I remember what you have told me about your involvement with BTA in the drilling of the Crystal 1 well, and I haven't mastered the well names, but it's the well in the southeast of 4 that --

A. Right.

Q. -- Read and Stevens now operates.

Am I correct in understanding that you were the

principal geologist that developed that prospect and turned it to BTA?

A. Yes.

Q. As part of that process did you provide them with geologic displays?

A. Absolutely, along with everybody else that I've tried to peddle this thing to.

Q. All right. Those geologic displays would have included a structure map, would it not?

A. Yes, it would.

Q. Would you have had cross-sections that were relevant to the prospect that were submitted?

A. One cross-section.

Q. Did you include an attempt to define in any way any of the Morrow intervals by a gross isopach?

A. Net isopach.

Q. You used net isopachs, and on what intervals did your have your net isopach?

A. There were eight specific sand packages that produce out here that I mapped.

Q. Each one mapped separately?

A. Absolutely.

Q. All right.

A. These are --

Q. BTA accepted the prospect from you --

A. Yes.

Q. -- under some kind of terms that allowed you to continue to participate in that well?

A. As an override owner, right.

Q. You did not have a working interest?

A. No, I did not.

Q. You had an override?

A. (Nods)

Q. All right. At the time that BTA went before Examiner Catanach in December of 1991, I believe it was -- yeah, December 15th of 1991 -- did they have available to you, then, all that work product that you had provided them?

A. I don't really understand the question, but let me just say that --

Q. Well, if you didn't understand the question, I'll give you another one.

A. Okay. Well, just what I want to say is that the map that you see right there --

Q. Yes, sir.

A. -- is not my structure map.

Q. I understand that.

A. My structure map was in the brochure BTA took -- obviously -- I don't know what they did as far as isopachs, but I know they did take my structure map and redid it,

because that's not my structure map.

Q. I know. Bear with me.

A. Okay.

Q. If you'll stay with the question, we'll get to --

A. Okay.

Q. -- answer that problem.

In December of 1991, then, they obviously have to have your work product, including your structure map?

A. Right.

Q. You were not hired and did not present your own geologic work for this prospect to Examiner Catanach on behalf of BTA, did you?

A. Once the ink dries with BTA, they don't even want to see you.

Q. Not only did they not want to see you, sir, they did not use your geology?

A. Exactly. But they drilled my location.

Q. I understand that.

As part of the presentation, are you aware of how Mr. Cox testified as the geologist for BTA before Examiner Catanach?

A. No, I do not.

Q. As part of your preparation for today's hearing, did you review any of that?

A. It didn't -- It seemed to be a moot point.

Q. Did you recognize as an overriding interest owner that part of the justification for this location was to move it south for geologic reasons?

A. For structural reasons.

Q. That is a component of geology, is it not?

A. Exactly, except our structure was wrong. We didn't --

Q. Both your structure and Mr. Cox's structure were wrong?

A. Exactly. We moved our location to the south -- We did the communitization agreement, we laid it down so we can get 660 from the south line, because we thought by going south we would get on the north end of the Whites City Penn high, which --

Q. I don't care which way you turn it, Mr. Brannigan; the point is that the geology that you had concluded --

A. -- was wrong, structurally.

Q. -- that you were farther downdip in the Morrow at the location you had mapped than eventually turned out to be the results when the well was drilled?

A. Sure --

Q. Okay.

A. -- no disputing that.

Q. You were playing off the Whites City Penn --

A. -- high.
Q. -- to the south --
A. Right.
Q. -- that high down there in the section to the south?
A. Right.
Q. All right.
A. And it shifts -- By drilling that well, it shifts the high south.
Q. Okay.
A. It does not shift it north. It does not have this high tongue coming through the northeast -- northwest quarter of Section 10.
Q. But let's look, if you'll turn with me to --
A. I don't have those, Tom.
Q. I'm looking for the Nearburg Exhibit Number 3, which is simply a reproduction of BTA's map at the Examiner hearing.
A. Okay.
Q. And if you'll set that alongside the structure map that you've presented us this morning, which is Read and Stevens Exhibit Number 7, then we'll have both of these displays.
A. All right, I've got it.
Q. We find that on the Nearburg Exhibit 3, that the

expectation is, the Crystal 1 well would have been -- Let me say it the other way. -- that the minus-8300 line would have been north of the Crystal 1 location, as BTA had mapped it?

A. We anticipated to be 183 feet higher than we were.

Q. All right. As part of their geology --

A. I can't talk about their geology.

Q. We're looking at it right here. As part of their geology, they have presented this structure map.

A. Right.

Q. Okay. How does this structure map differ from the one that you presented BTA to turn the prospect to them?

A. My structure map actually had us about another hundred feet higher than BTA's got it mapped.

Q. So you were more optimistic than they were?

A. Exactly.

Q. Okay. Am I correct in remembering that there is a structural relationship that ties Whites City Penn with South Carlsbad and has -- Bear with me, I'm a layman in this, but there's some deep faulting below the Morrow that will set up a pattern, there's a west-side low, if you will --

A. Well, there's --

Q. -- that runs to the west side, and these are draped in that fashion?

A. Right, but there's no faulting in the Pennsylvanian.

Q. I understand that. This is simply a reflection of a deeper fault --

A. Uh-huh.

Q. -- which then influences structure?

A. Sure.

Q. And to the west side of the axis running north and south through the BTA display on the west side, there is a low in this structural area?

A. Well, again, their map is wrong.

Q. When we look at your map today, the Exhibit Number 7, your structure map now includes the data from the BTA Crystal well that was drilled?

A. Uh-huh.

Q. And you have positioned it at a low where it's minus 8433, in the middle Morrow marker?

A. Right.

Q. All right. Let's look at the relationship of that structural position insofar as it affects what happened in the BTA well when they tested what you have mapped on your isopach as the "C" zone, and which Mr. Elger uses as this area in orange as his early middle Morrow. If

you'll find your isopach of -- your Exhibit 5 and its --

A. Exhibit 4?

Q. Exhibit 4 is your equivalent to Mr. Elger's orange interval on his displays, right?

A. Well, I don't now, because I'm saying he's correlating -- I've got two logs to work with, and like I said earlier, the "C" sand can be actually differentiated into an upper porosity and a lower porosity, and I don't know, except for those two logs, how he's breaking it out on the other umpteen wells that he has control for.

Q. All right, Mr. Brannigan -- Mr. Brannigan, on Mr. Elger's Exhibit Number 6 -- You have that before you? Do you have a copy of that?

A. What does it look like?

Q. It's the montage that's got the cross-sections.

A. Oh, okay, yeah.

Q. What I want to focus on at this point is what you have defined as the "C" sand --

A. Okay.

Q. -- and which I believe is approximately equivalent to what Mr. Elger has addressed in this orange area he's identified as the early middle Morrow.

A. Right.

Q. All right. And if we start the log of the BTA well on his Exhibit Number 6 --

A. Okay.

Q. -- and we look at that orange-shaded interval that he sets for the top and the bottom of the interval to be isopached --

A. Uh-huh.

Q. -- do you have any dispute as to, at least this log, as to where he has picked that interval?

A. As where he has picked what interval?

Q. The top and the bottom of the interval to be mapped in here, without regard, then, to cutoffs.

A. Well --

Q. I don't want to worry about the percentages yet; I want to look at the height.

A. No, I don't.

Q. All right. So when Mr. Catanach compares these maps, at least he knows that you and Mr. Elger, for this particular well, were looking at the same vertical interval on the log?

A. Except Mr. Catanach's got to realize that in some of these wells, like I said, to the south, the two W.A.D.I. wells in the south half of Section 9 only have that upper porosity. They don't have the lower porosity.

So again, the upper porosity in the Crystal well is wet; the lower porosity is water-free. You can see it on this cross-section. We've got -- ohms -- You've got

300-plus ohms, 400 ohms. I mean, it's not wet.

Q. All right.

A. So that's -- that's a --

Q. I'm not that far yet.

A. Okay, okay.

Q. When you look over on the right-hand portion of the log display, in this orange area --

A. Right.

Q. -- you see two sets of perforations, one in the upper portion of the orange, another in the lower portion. Okay?

A. Right.

Q. And then I take the next mark up, there's an X. That's some type of bridge plug, some way to isolate that zone from the yellow.

A. Okay.

Q. All right? Did I remember it correctly when you told me that when this well was being evaluated by BTA that you participated in that process and it was necessary to set that bridge plug there to isolate off the water flow from the orange zone?

A. I participated at that point with BTA on only getting weekly or monthly reports. I was not in on any decision on where they were going to perforate or put their cast iron bridge plug or their on/off tool. They did it

all themselves. I was a participant only as an onlooker.

The only reason we even got the wellbore is because they were nice enough to tell us, Oh, by the way, we're walking.

Q. All right.

A. They didn't offer us the well; we had to go to them to buy it.

Q. What I'm focusing on is the issue of where the water may be introduced or sourced within this orange area. And am I correct in understanding that you have some belief --

A. Belief -- There's the logs.

Q. What?

A. Look at the logs. You don't have to take my word for it.

Q. I'm looking at the production test.

A. Look -- Forget about the production test. They perforated two intervals at one time.

Q. Okay. And it's your contention -- I want to make sure I don't confuse myself on what your position is. Your contention is that the double perforations, if you will, the two sets, caused water in the lower set --

A. No.

Q. -- to influence what might have otherwise been dry or water-free production --

A. No.

Q. -- in the higher set?

A. No, I'm saying that in the Read and Stevens Crystal well, or the BTA well at the time --

Q. Yes, sir.

A. -- that that orange sand package --

Q. Yes.

A. -- should never have been perforated, either that -- the lower part, which is water-free, or the upper part, that is wet, because there is no way that they were going to be able to stay out of water, even if they hit the water-free zone.

But what I am saying is that I have isolated that sand to show that the water sand, which is the upper part of that orange package, does not exist 1980 from the south line, 660 from the west line in Section 4.

Again, what I was saying, the south -- the wells in Section 9, the two W.A.D.I. wells, are producing out of the orange sand, but producing only out of the high-porosity sand, which are water-free that high up on the structure. They do not have that lower sandbody in the orange sand that we do have.

As you move to the north, you lose your water-bearing orange sand and gain thickness in your gas-bearing lower orange sand. Is that --

Q. Let me follow your argument. If I look at your structure map and I compare it to your Exhibit 4, which is your Morrow "C" sand isopach --

A. Let me tell you the fallacy of the structure map.

Q. Of your structure map?

A. Of all the structure maps, of all the structure maps, trying to pick an oil-water contact.

The oil-water contact, based on that, is based on the middle sand -- Mr. Elger has picked a water contact of 83-something, 83- -- what? -18 or something like that? 8300, okay?

So what he's saying -- Now, if you drew a line between those two sands in the Read and Stevens well, guess where you got. About 8300 feet.

Okay. So what he's saying is that we've got water -- he's mapping this as a water -- one sand. He's saying the water is on the top and the gas is on the bottom.

Q. And that's what you've just told me here, in the log of this well --

A. That's what I'm telling you, but Tom, you're not listening. What I'm telling you is, the sand on the upper part of the orange exists only to the south.

Q. All right. Let me see how --

A. The lower stuff does not exist. As you move to

the north, you pick up your lower orange sand. You go farther to the north and you pick up your lower orange, which is water-free. A change in gas-water contact now, okay? Or gas-water contact. We've got a change going on now.

There is no way that you can have water -- one solid, homogeneous sand where water is on the top and gas is on the bottom, unless you have some type of shale or some type of impermeable barrier, which, guess what, you do.

Q. Let's look at your --

A. So what you do, as you move -- Let me explain, let me answer your question. As you move to the north, you gain your lower water-free sand, you lose your upper water-wet sand.

Q. I want you to illustrate that on the structure map with me, and let me step through it so I --

A. Which structure map?

Q. Your structure map, Exhibit Number 7. We're looking at your structure map, and you're telling me as we move north we're going to move downstructure in the reservoir --

A. Uh-huh.

Q. -- but as we do so, then, I can look at Exhibit 4, which --

A. No, no, no, no.

Q. Would you wait for the question?

A. I don't -- No, I don't know what you're saying, moving north from the proposed location or from the Crystal well?

Q. We have not gotten to the proposed location. We are simply looking at the BTA Crystal --

A. That's what I --

Q. -- Number 1 well.

A. That's all I want to know.

Q. That's all we're after. When we look at moving north from the BTA well that exists, you're going to move downstructure --

A. If you go straight north, you will.

Q. That's what I'm talking about. You're moving in a northerly direction, and it's -- the way this is mapped, you're going to go -- You've mapped it to go upstructure.

A. No, going downdip --

Q. I'm sorry, you're going -- We get 8500, we're going downstructure, going north. All right.

When I turn to the isopach, this isopach as represented by you is a combination of this total orange interval and has not been --

A. -- isolated.

Q. -- isolated, so I can distinguish what you have

described for me is the concept that as you move north, you lose the water portion of this interval, and then gain water-free gas in this zone.

A. Right, it's water-free in the Read and Stevens well right now.

Q. All right. With regards to that issue, if and when Read and Stevens ever replaces the Crystal 1 well --

A. Uh-huh.

Q. -- and the focus of their interest is this orange sand, the opportunity for them exists, going north in the section as to this sand?

A. And east going updip.

Q. And east going updip. So you could go north and you could go east?

A. Orthodox would be 1650 from the south, 660 from the east line. Perfectly good, I'd put my money in that prospect right now.

Q. All right. When you look at the consequence of either Nearburg's proposed unorthodox location or the closest standard location, it appears not to matter in terms of protecting yourself as to this orange zone?

A. Sure it does.

Q. The better productivity for that zone is farther away from where you now have your well and a farther distance from either of Nearburg's proposed locations?

A. What I'm saying is that when you go from the W.A.D.I. wells in Section 9, which have zero feet of this lower gas-bearing sand, to the Read and Stevens Number 1 Crystal, you gain, using his cross-section, 30 feet of sand. Okay, so you go from 30 feet -- or zero to 30 feet. You're building to the north.

So we go farther north and we go 1650 from the south line, 660 from an east line, it should be even thicker, and we're losing our water sand. So you are going to be draining us.

Is that the only sand that they're going to hit?

Q. I want to do these one at a time so I understand what your concern is with regards to this location when we're working out of a common corner, if you will, and you're telling me it is still of concern, notwithstanding the fact that the BTA Crystal well, where it is now, is unable to produce out of this orange sand?

A. Uh-huh.

Q. And it still matters to you as to where the Nearburg well is in relation to that corner, that common corner?

A. You're going to be draining the southeast quarter of Section 4 -- When we drill the Number 2 Crystal, 1650 from the south line, 660 from an east line, you are going to be draining -- through your unorthodox location,

drilling our acreage -- draining our acreage. That's what bothers me. The future, not just today, not just what's producing, but the future.

Q. It will matter how much gas is recovered by Nearburg, only if Read and Stevens drills a replacement well for the Crystal well?

A. I can guarantee you, as an interest holder in the Crystal, that that new location will be drilled in the future, because whether Charlie Read does it, I'll do it, Tom Bell, who has a 15-percent working interest in that well, will do it. That well will be drilled. It may not be in Charlie Read's lifetime, but that well will be drilled.

Q. With regards, then, to this orange area, you and Mr. Elger, both on an isopach basis and on a structural basis, have a substantial disagreement as to those issues?

A. No, we don't, not on our isopach maps. He's just got his channel -- He's got a northwest-southeast-running channel. I have a northeast-southwest -- or a northwest-southeast channel, but mine also bifurcates.

The only difference between our two maps is this lobe here. I've connected it. So he could just as easily have done this, bifurcating channels, the way I did it right here. So there's no big problem.

The big problem, Tom, in this is that by not

giving -- by not honoring a control point in the southwest of Section 10, which tested 1.7 million cubic feet of gas a day and giving it zero feet of pay, you don't honor that control point, you give it zero, you move your channel to the north.

And I'm saying that you have to honor that control point at a 5-percent crossplot porosity cutoff. Then it gives you 21 feet of pay, and your channel moves to the south. Hey, I'm doing you guys a favor with my geology, drill to the south.

Q. Help me stay focused on the questions. The -- Let the Examiner draw his own conclusion about the differences. It matters to you and to Mr. Elger what the analysis is of the old C&K Pennzoil Federal Number 2 well in the southwest of 10?

A. Right.

Q. And there's a substantial difference of opinion as to how to reconcile that data with your maps. He has chosen an approach that's substantially different than yours?

A. Only on that sand. But if you go to the yellow sand, he's using my approach. He's got it both ways, he wants it both ways. He wants to be able to say, Well, for this sand I'm using an 8-percent, for this sand I'm using a 5-percent. You can't just take a -- You can't throw out

the neutron. Like he said earlier --

Q. I know you don't agree with his position; I'm just trying to frame for the Examiner that there is, in fact, a substantial difference between you over this well.

A. No, there isn't, Tom, because what he said in his testimony was that the density porosity is not the true porosity; the true porosity is the crossplot porosity. Am I correct? That's exactly what he said.

So how can you go ahead and say your yellow sand -- use just the density and throw out the neutron? Well, you take the neutron and the density, add them up, divide it by two, guess what you get? Five percent.

So on the yellow, he's got 5-percent crossplot porosity, he's using 8-percent down here. It doesn't jibe, it doesn't work that way.

Q. In addition, apart from this difference, you are dismissing C&K's efforts on this wellbore, and the information shown on this drill stem test that it was -- it got a water flow?

A. No, it didn't. No, it didn't.

Q. On the drill stem test on the orange -- Is this the right one?

A. It didn't get water. Are you talking about the one in the southwest of Section 10?

Q. That's the log I'm trying to find.

A. Mr. Elger --

Q. Do you have that cross-section?

A. Mr. Elger in his testimony told Mr. Padilla that it tested water-free, and that's what the PI cards say. Open an hour and 30 minutes, gas to surface in eight minutes at a million and a half --

Q. Whoa, just one minute. If you'll look at your Exhibit Number 1, let's go to make sure we're looking at the same well, the C&K Petroleum Number 2 well. Your interval that we're trying to compare is the "D" sand, Okay?

A. "C" sand.

Q. The "C" sand. Yes, sir. All right.

Mr. Elger gives it 32 feet of gross sand out of the orange interval, right?

A. Right.

Q. And we look at your isopach, and you're giving it -- I don't have a gross number for you. This value is a net number using your cutoffs, and you get 21?

A. Right.

Q. Okay.

A. Right. And let me answer this too. The majority of the work that was done by me to get these numbers were checked by a Schlumberger log analyst by the name of Galen Ponder.

Q. Let me make sure I understand the testimony. The point of difference, then, between you, as you remember, is the fact that Mr. Elger has chosen to use an 8-percent crossplot porosity cutoff?

A. No, he's chosen -- He's using the 5-percent.

Q. On the orange sand --

A. On the yellow sand he's using the 5-percent.

Q. No, sir, I'm still on the orange sand --

A. Okay.

Q. -- and I'm looking at his Exhibit Number 6, and the legend says --

A. It says 8-percent crossplot.

Q. -- 8-percent crossplot porosity, okay.

Am I correct in understanding that what you have done to get the net is, you've used the 5-percent density porosity cutoff?

A. No, density neutron crossplot porosity.

Q. So you've also used crossplot porosity for the orange sand, and you used 5 percent instead of 8 percent?

A. Exactly.

Q. That's the difference there?

A. That's --

Q. All right.

A. -- exactly the difference.

Q. All right. Let's return back to Exhibit 6, then,

and go up to the yellow portion of the middle Morrow. Mr. Elger uses the late middle Morrow as a nomenclature. This, I think, looks like your --

A. -- probably "B" -- "C"? No, I think the "B", Tom.

Q. Is it "B"? It's the "B" one. It's your Exhibit Number 3.

A. Yes, sand number -- sand letter "B", Number 3.

Q. All right. When I look at the log of the BTA well, I believe you told me that BTA set a bridge plug between the yellow and the orange, and then they tested the yellow zone, and then the lower of these two green zones, those were tested in some combination together? Am I correct in understanding that?

A. Well, I'm looking at my map, which is "A", "B", "C" and "D", and I'm trying to cross -- let me go ahead -- let me just write down for a second, what you're calling, then, on my "C" would be -- this would be yellow and this is orange. Okay, now I'm ready.

Q. All right, I'm calling your "B" sand the yellow sand.

A. Right.

Q. All right. When I look at your isopach, Exhibit 3, are you and Mr. Elger still using the same vertical interval in the log of the BTA well?

A. Exactly.

Q. Okay. So that's not a --

A. That's not a point, no.

Q. -- point of dispute?

The point of dispute here is that now to get the net map, he's using an 8-percent density porosity cutoff, and you have used 5?

A. No, we're comparing apples with oranges.

He's using an 8-percent density porosity, and if I use an 8-percent density porosity without the neutron --

Q. I'm not asking you the argument. What did you do? You did not use an 8-percent density porosity cutoff?

A. I used the density for control, Tom, but even under -- Mr. Elger even said that density by itself is not true porosity. You have to use the neutron to get your true porosity, and you crossplot it.

Q. All right. So you have used 5-percent --

A. -- a true porosity based on his testimony of a crossplot porosity.

Q. You have used the same percentage cutoffs and the same methodology for both the yellow reservoir and the orange reservoir?

A. Have I?

Q. Yes, sir.

A. Yes, I have. Yes.

Q. That's all I'm asking.
A. Yes.
Q. You did the same?
A. I did the same way. He did --
Q. Okay, I understand he did. All right.
All right, BTA now perforate both the yellow and the lower of the green reservoirs on Mr. Elger's display?
A. No, they did not. BTA did not --
Q. I'm sorry, Read and Stevens did? I'm sorry, I --
A. Read and Stevens perforated more than that. Read and Stevens.
Q. Strike the question.
A. Okay.
Q. Let me ask you again.
BTA, after they tested the lower orange, did they test any other Morrow above the orange reservoir before they gave up on the well?
A. The lower orange and the upper orange were tested together.
Q. Yes, sir, I see that, the orange reservoir, tested together.
A. You said the lower orange.
Q. I misspoke.
A. Okay.
Q. The orange reservoir was tested by BTA?

A. Right.

Q. After that, did they test any of the Morrow reservoirs above that before they gave up on the well?

A. Not above it. Below it they did.

Q. All right, not above it. So they gave up on the well?

A. Right.

Q. Did you have any discussions with BTA about having abandoned any of these Morrow opportunities above the orange reservoir?

A. There was absolutely no communication as far as what was going on in BTA's office with asking our opinion. We found out that they abandoned the Morrow for the Wolfcamp after it was already done.

Q. All right, so the answer is no.

The next operator is Read and Stevens?

A. Right.

Q. Read and Stevens comes in and they test the yellow reservoir on Mr. Elger's map?

A. Not right away.

Q. All right, what is the sequence above the orange reservoir?

A. Well, they -- Well, I don't remember chronologically exactly, but they squeezed off the orange sand, went down to try to get what I call the "D" sand and

also another sand that's actually below the Morrow marker.

Q. Okay.

A. They couldn't keep the water off of it. Mechanically, when BTA started upside-down, we couldn't get these. Like I said earlier, what I call the "D" sand by itself has produced a billion and a half out of a reservoir sand that looks just that good. That is a potential pay, another reason we want to drill 1650 from the south, 660 from an east line.

Q. Read and Stevens gets the well, they set the bridge plug just above the orange reservoir to isolate the water and begin investigating, then, those Morrow intervals above the orange reservoir?

A. Right.

Q. And the first one they look at is a combination, if you will, I think, of the yellow reservoir and the lower green?

A. No. Let's refer to my cross-section, because it's easier, then, because he's got different greens over here.

Let's say -- What they did was, they went and hit -- perforated the yellow -- or excuse me, the "B" sand and then came up and hit the "A" sand.

Q. All right. Now --

A. Produced it for a period of time.

Q. We're talking about the same thing?

A. Right.

Q. Those two sets of perforations were produced together?

A. They were completed not together, but they were produced -- There may have been a period of time, and I don't know for sure, Tom, but there may have been a period of time where "B" produced by itself before they came and hit the "A" sand.

Q. All right. In December of 1994, then, in terms of chronology, Read and Stevens is producing from what you have identified as the "B" sand and the "A" sand, and those are both in the middle Morrow?

A. Uh-huh.

Q. Both are being produced in December of 1994?

A. If you tell me, now --

Q. All right.

A. -- there was a period there for about six months the well was shut in because of gas prices.

Q. All right. I have taken production information reported from *Dwight's*, and then what we could obtain out of the Division records with regards to production on the well. Let me share this with you.

Mark this as Exhibit Number 7.

I know you have no way to verify this, Mr.

Brannigan. If you'll simply accept for purposes of my question the representation that these numbers are accurate, the point of my question is that if you read the schedule, then in December of 1994, the "A" and the "B" sand in the Read and Stevens well is producing on average 569 MCF a day by this calculation?

A. Sure, but the well was also choked back.

Q. All right. The next report shows that in January the average rate, when calculated, goes to 946 MCF a day. Has anything occurred in the wellbore with the "A" and the "B" sand to cause that rate to increase?

A. Well, Tom, I don't have the chronology in front of me, but I guess you're leading into we opened that upper sand; is that right?

Q. Yeah, you -- At some point in time the well file reflects that Read and Stevens has opened an upper Morrow sand -- You haven't presented me a map of that, so that's not one of your maps, but it's another Morrow sand.

A. Sure.

Q. When did that happen?

A. When did that happen?

Q. Yes, sir.

A. Oh, I don't know, Tom.

Q. All right. Don't know when in relation to the schedule --

A. I would venture to guess, though, that it was completed when the production went up. If I was a betting man, I'd bet that. So I agree with what you're leading to, that when the production went up, probably the other interval went up.

But one thing you've got to remember, that because gas prices were low, when we had only the "A" and "B" open, we had this well choked back. It wasn't till gas prices went up that we hit the upper sand and put it on line.

Q. That's what I'm trying to understand, is the chronology in relation to when the upper sand is added.

A. I --

Q. You don't know?

A. Tom, all I can tell you is, if the production went up, the sand probably was added.

Q. Okay.

A. That's about all I can say.

Q. Because of --

A. But the gas prices may have already -- might have gone up too, and that would have been -- opened the choke.

Q. Do you know of any reason to add the upper Morrow sand to the "A" and the "B" --

A. Yeah --

Q. -- during this period of time?

A. -- that's what we talked about earlier, how Nearburg didn't have any economics. And I'm saying that what you look at is return on investment but payout. I mean, payout of this well -- This well cost a million dollars to drill and complete.

And you get two -- you're making -- you're making 500 MCF a day, and you say, Well, it's going to be a three-year payout but I can make a million and a half a day, it will be a nine-month payout, well, it doesn't take a genius to figure out what you want to do. You want to get your payout.

Q. Isn't the logical sequence of decision-making to achieve that objective one where you would take existing perforations, and if price is increasing you would open the choke, which is the easiest thing to do, and see if it will produce more gas, and therefore help you with your rate, cash flow, and all the rest of that stuff?

A. Right.

Q. All right.

A. And open up another set. If you've got pay -- if you've got a -- if you had a gold vein in your mine and the gold prices are going up, wouldn't you want to go ahead and start tapping that mine? That's what we did here.

Q. Is there any analysis of what was expected to be the ultimate gas recoverable from the middle "A" and "B"

before the upper Morrow was added?

A. The numbers I heard floating around Read and Stevens was around 1.5 to 2.5 BCF, but I -- you know --

Q. That's just what you have heard, and you don't have documents to --

A. I'm not an engineer. I don't even -- You know, I don't have the decline curves, P-over-Zs, whatever engineers use to do all this stuff.

Q. Okay.

A. I really don't know, Tom.

Q. All right.

A. Geology is subjective, but I've found out through the years that I think engineering is just as subjective.

Q. Do you have available, then, to you information by which the Division would have benefit of what might be the actual productive drainage areas of any of these Morrow reservoirs?

A. Do I have?

Q. Yes, sir.

A. I don't, except to say that what you would look at would be -- You'd have to go ahead and look at your channel geometry and base your drainage on channel geometry.

Q. It would be impossible to calculate drainage unless we can attribute a certain estimated ultimate

recovery per each individual Morrow sand reservoir ■■

A. Except you don't have --

Q. -- would that not be --

A. Yeah, but you don't have to do it in just one specific borehole. What you could do is, you could look at an offset well that produced out of just one specific sand and say, you know, it had 30 feet of pay at 5-percent crossplot, made 3 BCF over X amount of years.

You don't have to go ahead and use the Read and Stevens Crystal well to say what are the "B" and "C" sands going to make when you've got offset production on wells that have been -- I guarantee you, if you look around you're going to find wells out here that are just open in the "A" and the "B" or the "B" and the "C" or the "C" and the "D", and you can use those, and you don't really have to extrapolate anything; you've got the *Dwight's* decline curves for the last 20 years.

Q. Theoretically, I assume we could -- someone may have been able to analyze actual productive acreage in this case. But we don't have it today, do we? You don't have it?

A. I wouldn't have it, anyway. I'm not an engineer.

Q. Okay. All right.

Let's look at the distribution of the sand when we compare your Exhibit 3 with this -- which is Mr. Elger's

yellow reservoir, the late middle Morrow.

A. I've got it. Do you want me to compare it?

Q. Oh, no, you take too long. Let me do it.

It looks to me like a substantial difference of opinion with regards to the size and shape, and that difference is influenced by how each of you have chosen to treat the C&K Pennzoil well in the southwest of 10.

A. My data was gotten from Galen Ponder, who used to be a log analyst for Schlumberger. He analyzed all these sands for us.

Q. So your Exhibit 3 is not your work product? Or what does he do? He gives you the log values, and then you contour it?

A. I went ahead and did the log values. I cross-referenced -- I checked with Galen to make sure that I was on the right, because a lot of these wells you had to go ahead and check for invasion, and I wanted to go ahead and make sure my resistivity logs were right.

My values and his values were basically the same. It's my isopach.

Q. All right. What I'm asking you, though, is, apart from you and Mr. Elger using a different methodology for getting your cutoff --

A. Uh-huh.

Q. -- that the data point of importance is going to

be how each of you have treated the C&K Pennzoil Federal well in the southwest of 10?

A. Right.

Q. All right.

A. Tom, is the -- Orange is my "C", right?

Q. I think I've finally got that right. That's "C".

A. Okay, and then my --

Q. "B" is the yellow one.

A. -- "B" is the yellow.

And that's also where they ran their DSTs.

Q. When you look at the yellow reservoir, your "D" sand member --

A. Yes.

Q. -- of the Morrow --

A. Right.

Q. -- geologically, do you see any kind of correlation or direct relationship between the thickness of that Morrow and the actual productivity of the wells?

A. To answer your question, I guess I would say that the two C&K -- the two W.A.D.I. wells in the south half of 9 have -- those -- the 22 and 26 feet open. Both are very good wells.

The Mallon well in the southeast of Section 10, I can only assume with 24 feet of pay that they have that open too.

The C&K well in the southeast of Section 8 does not have that interval open.

Q. How about the C&K Pennzoil 2 well in the southwest of 10 with also 26 feet of pay?

A. It has -- They ran a drill stem test which would include -- they ran actually two drill stem tests, giant drill stem tests, too big, that tested 1.7 million a day out of an interval from 11,326 to 11,544. They ran a second drill stem test from 11,260 to 11,544 that tested 1.1 million a day.

They did have some drawdown on their initial and final shut-in pressures.

The only problem I have with the way they did their giant drill stem test is, on both DSTs they tested part or all of what I call "A", "B", "C" and "D" sand.

Now, I know from the Read and Stevens -- the BTA well, that when we ran RFTs on these sands, which again the Commission has all the RFT logs, they're all -- they're probably even on -- they're probably even on microfiche, so you would have all that information, the RFT's.

When we ran RFTs on our well, the sand in question in our borehole, which is wet, the orange sand, the sand that's actually wet, the upper part -- okay, I'm --

Q. I'm going to deal with the yellow sand.

A. But Tom, I've got -- You're talking about pressures, and I've got to talk to you about --

Q. No, you're talking about pressures. What I'm trying to understand, Mr. Brannigan, is, when I look at your isopach of the "B" sand --

A. Yes.

Q. -- and I see that the C&K wells in the south half of 9, which you have a total cumulative production at a certain point on this map --

A. Four-plus BCF.

Q. But who knows -- And there is no way to know what the actual contribution of that has been from the "B" sand in those two wells?

A. Not if they opened all the rest of them together.

Q. That's my point.

A. Well, my point is, though, there's other wells out there that are just producing from each individual sand.

Q. All right. When we look -- My question is, can we correlate productivity to thickness with the data? And I think the answer is no.

A. Yes, it is. We can.

Q. Well, correlate for me the productivity in the "B" sand for your 47 feet in your well --

A. Well, Tom --

Q. -- in relation to the C&K wells in the south half of 9.

A. Well, Tom, we can't do that on our specific well, and that's what I'm telling you. I'm telling you wells that -- where you have more than one sand open, you can't do it.

But when you find yourself a well in Whites City Penn South Carlsbad field that only opened that orange sand or yellow sand or green sand, you've got a great handle on it.

I'm saying -- You're asking me, can it be done? And I'm saying absolutely, yes, it can be done.

Can it be done here based on what we're seeing? No, because there's too many intervals been opened.

But I think what you're doing is skewing the data. Sands can be reservoir quality, production can be determined on each individual sand, but only if they've been opened individually, and they have been in this tract.

MR. KELLAHIN: I have no further questions.

EXAMINER CATANACH: Ernie?

MR. PADILLA: I don't have any questions.

EXAMINER CATANACH: Let's take a little break here so I can get my thoughts together on this.

(Thereupon, a recess was taken at 12:20 p.m.)

(The following proceedings had at 12:30 p.m.)

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Brannigan, in the interval you've called the "C" sand, have you determined a gas-water contact in that interval?

A. Well, I tend to agree with Nearburg's interpretation of about 8318, and I'm basing that on, Mr. Examiner, on the log characteristics in the Read and Stevens Number 1 Crystal where you have actually two individual sands.

If you look at the two sands, the two sets of perforations on sand Number "C", the lower set of perforations in sand "C" are water-free; the upper set does contain water.

Now, my only problem by saying that I do agree with them and say 8318, 8300 feet, is that it's really unusual to have a water-bearing sand on top of a gas-bearing sand, unless they're two individual sands.

And see, that's my point, that as you go to the north, you pick up that lower sand that doesn't exist in the two W.A.D.I. wells in Section 9 but does exist in the Read and Stevens well. That's water-free even below 8300 feet.

But above 8300, the upper part, which is wet in our well, structurally higher than 8300, is wet. And what

I'm saying is that there are probably two separate sands in this one package, separated by maybe a shale. Because we ran RFTs in both those intervals, the upper and lower orange sand or upper and lower "C" sand, and we had two different sets of pressure data.

The pressure in the upper sand, the high-porosity sand, was less than 1800 pounds. The pressure we had in the lower orange sand, by my recollection, was almost -- over 4000 pounds. It may have been 4500 pounds.

So what we're seeing there, based on RFT's, are actually two different sands.

Now, I don't want to get in trouble by giving you the pressure numbers, but I can tell you there were substantial thousands of pounds difference between RFT pressures on the upper and lower "C" or orange sand.

Q. Is it your opinion that the Read and Stevens -- I mean the Nearburg well at the proposed location -- will that encounter both of those sands in the "C" interval?

A. I think so, I really do. I think they'll get both of them. And hopefully they won't have -- On their orthodox location, hopefully, they will encounter both of them on their orthodox location, and hopefully both of them will be updip, for their sake.

I mean, I don't want to see anybody drill a dryhole. I just don't want them to see us -- draining us.

But I think they'll encounter both of them.

Q. And they will be wet at the proposed location?

A. I believe they're going to be at the proposed location. I think, based on my structure -- Based on my structure on the Morrow, by moving down to where I sit, 1980 feet from the north line, they would gain 65 feet of structure.

So it would be to their best interest and to the state's best interest to move to the south, to gain structure.

Q. Did you map that, those two "C" intervals, individually?

A. No, I did not. I mapped them together. I just mapped them together. The reason is, because sometimes they are and you can map them together, and sometimes they're not.

And when I first started looking at some of these, the old count-rate neutron logs, that upper part of it was clean. Sometimes you had this lower part that had the big porosity -- The upper part of it looked like it was almost a limestone. It was a clean gamma ray but, you know, 4- or 5-percent porosity. But then when I got into it more and more and I started digging this up, these weren't cherty limestones; these were sandstones that actually produced.

So to answer your question, I haven't mapped them individually for this meeting; I have mapped them individually back in my Roswell office, yes.

Q. So you've used that to determine that you can drill a well in the southeast quarter --

A. Yes --

Q. -- that won't encounter --

A. -- yes, I'm sorry, I misunderstood your question. Yes, I have mapped them individually, but not for this case.

Q. The DST in the C&K well, that was done over a large interval, including the "C" sand; is that correct?

A. Yes, both drill stem tests, one was 118 feet and one was -- oh, 218 feet and one was 284 feet.

Q. So you really can't tell from the tests where any of that production originated from?

A. No, you can't, that's the problem. And you can't really tell because of a big interval where the drawdown was coming from.

Just like I said, when we -- when BTA ran an RFT on that upper "C", upper orange sand, we only had 1700 pounds of pressure. We were probably draining from the two W.A.D.I. wells in Section -- in the south half of Section 9. Where if we at BTA would have run a drill stem test over a 280-foot interval in the Morrow section, we would

have showed substantial drawdown too, because we would have had a thieve zone, being that upper orange.

But my point is that the C&K Number 2 Pennzoil showed substantial gas, showed drawdown. But if only one of these four sands that was DST'd had a lower bottomhole pressure, you've got a thieve.

So these DSTs show you one thing: You've got commercial gas. But what it doesn't tell you is which zone may be depleted.

Like I said, for the last three years I've been trying to get ahold of this wellbore.

Q. So you've really got no idea whether the "C" sand is going to be productive in that well?

A. We don't, except to base it on using a 5-percent crossplot porosity. It's in that wellbore, and it's in the other wellbores, and the other wellbores produce.

Somewhere out of those four sands, "A", "B", "C" and "D", there's a substantial amount of gas reserves. Whether it's out of three or just one, I don't know. One of them, obviously, is going to be a thieve zone, drained possibly by -- maybe the Mallon well that right now is open in the "A" and "B" sand, maybe that well -- You know, when they ran their two DSTs they were -- they had -- you know, maybe they had drawdown from that drainage.

Or maybe from the W.A.D.I. well, because the

Number 1 -- the Number 1 Pennzoil well in the southeast of Section 9, as far as I can remember, was already on line when C&K drilled the Pennzoil well in the southwest of 10.

But my point on the drill stem tests is, they're pretty inconclusive, except to say somewhere out of those four sands you've got some commercial gas.

What you need to do, and what we had planned to do, was re-entering that borehole and running RFTs, because you're updip from the Mallon producer in the southeast quarter, and you've got great-looking sands.

Q. The net effect of that DST test was to shift that whole reservoir to the west there, the whole isopach?

A. Not the DST.

Q. Well, the fact that there was production --

A. Exactly -- well, the fact that -- see, I -- before -- It's kind of like what came first, the chicken or the egg?

The DST information was there, but I was already using the 5-percent crossplot porosity cutoff. Even if they didn't run a drill stem test, even if we had no indication of any gas -- unless, of course, they ran a drill stem test and got no gas, then it would have been a different -- maybe I would have changed my scenario to an 8-percent. But I was using the 5-percent for all this, so it just made sense. They got 1.7 million a day and they

got 5 percent porosity. So it looked good.

And what that does, then, is, it shifts -- by honoring that point -- by honoring those two points like I have, on both his yellow and his orange, by giving those both pay, what you do then is, you shift -- and in the case of his yellow sand, shift that east-west sandbody -- By the way, that east-west sandbody -- I have it too. Our geometry on these channels are virtually the same.

But when you honor that C&K well and give it porosity, because it did have gas and it does have 5-percent, what it does is, it takes -- where he had his east-west sandbody this way, when you honor this point, whoop, it brings it down.

And the same thing with the orange sand. When you give it pay, you shift this channel where the axis would run to the north, you give that -- you honor that, and it shifts this axis here.

That's the only difference between our isopach maps, is the honoring of one borehole, one borehole that produced 1.7 million cubic feet of gas.

EXAMINER CATANACH: I have nothing further of this witness.

Is there any --

MR. PADILLA: I have nothing.

EXAMINER CATANACH: The witness may be excused.

Would you like to give brief closing statements, Counsel?

MR. KELLAHIN: Mr. Padilla?

MR. PADILLA: Sure.

May it please the Examiner, I think the -- this hearing has evolved into a cross-examination, extensive cross-examination of the real expert in this area.

We've spent -- I don't know how long we've been here, but I think most of the time that we've been here, approximately one half of the time has been Mr. Kellahin's cross-examination of Mr. Brannigan, trying to -- I don't know, trying to get more information on this area.

I'm not going to go into each fact that we have shown. I think that we have shown a structure by pay thickness, that the nonstandard location is not necessary.

In terms of Mr. Brannigan's just latest answers to your questions, it's very evident that honoring that well in the southwest quarter of Section 10 has to be done. He has shown by re-entry of the other wells in Section 4 that you will get economic production by use of 5-percent crossplot porosity. That's the whole thing in this case. If you have it -- If you do it, then, you move Mr. Elger's geology west and you're going to be -- they're going to drill a good well at a standard location.

I recall a long time ago I did a hearing before

the Federal Energy Regulatory Commission on the South Carlsbad Pool for Corinne Grace. There are -- I used a case that had been -- I think it's Oil Conservation Commission versus Grace, and I can't remember the citation for the case, but it certainly describes the South Carlsbad Morrow Pool in terms of "A", "B", "C" and "D" sands. They come and go in this area, and they're all, to some extent, separate reservoirs.

I know in that case we were trying to establish that production was from a separate reservoir in the "D" sand, or any one of these sands. But we had a -- some evidence of just this here that came out of hearings way back, whenever that case was decided and went to the New Mexico Supreme Court.

But the point is that I think we have shown very adequately that correlative rights will be affected if a nonstandard location is allowed.

We may not be producing today from the Read and Stevens well, but there's drainage very likely going to occur.

So with that, I'll just be quiet, but I think that the only thing I can say is that the whole thing here has revolved around Mr. Brannigan's testimony.

EXAMINER CATANACH: Thank you, Mr. Padilla.

Mr. Kellahin?

MR. KELLAHIN: Mr. Examiner, I'd like to pose a solution for you, other than leaving this with someone else.

You've done a great many of these Morrow cases before, Mr. Examiner. I have provided you a copy of the precedent in this area. You have the distinction of authoring one of these orders; it's 9050-B. It was a dispute with Marathon Oil Company and Oryx over a Morrow reservoir. In this instance, it was the Indian Basin Morrow.

And I'd like to remind you that this went to the Commission and the Commission spent an awful lot of time talking about how to address unorthodox well locations in Morrow reservoirs.

And if you'll turn to the *de novo* order, which is R-9050-C, and find page 3 of that order, you have guidance on how to resolve this.

The Commission concurred with what you had earlier concluded, and that was, when there is substantial geologic disagreement as to the depositional environment of this -- in this case it was the Morrow "A" -- and the productive acreage in the Morrow underlying whatever area was involved and the potential for commercial production, then they disregarded all the geology and imposed a location penalty.

And I think that's what you have here today, is a substantial geologic disagreement for which you will not be able to come to a definitive geologic conclusion.

Despite Mr. Brannigan's expertise and knowledge in this area, it worries me considerably when he tells us that the BTA well, one of the significant, relevant wells in this area, was projected by him to be some 260 feet higher in the reservoir where structure mattered than it actually was drilled to be. It's a reflection on how difficult and, I contend, how impossible it is to make a decision with regards to the geologic issue.

And you will have to decide, then, as one of your options, whether you want to deny to Nearburg the opportunity to drill an unorthodox well location and be faced with a consequence of being some 330 feet farther south in a part of the reservoirs they choose not to be in, on the expectation and belief that Mr. Brannigan is going to be right.

That dilemma is resolved by approving this location with a penalty. We have handled penalties like this, with this precedent. It does not obligate you to resolve impossible geologic disputes and differences of opinion. The one consistent thing in the presentation today is the fact that no one can represent to you what are the reliable productive acreage in any of these spacing

units. It's not possible to do that.

When we talk about unorthodox well location penalties, we consider two factors: one a footage encroachment, and, where possible and reasonable, with some degree of scientific reliability, we will compare and relate productive acreage between the objecting location and the offending well location. That's not possible here.

What the Commission has done and directed as a precedent would be the use of a single-component penalty in a penalty formula. The choices are to figure out the distances in the common corner.

This is in a diagonal objection location. None of the parties in Section 3, towards which the well is directly encroaching, are opposed to the granting of this Application.

And simple junior high geometry, which I didn't do, but the engineer did and verified for me, that if you take the standard well location that now is allowed, which would be 1650 from 990, the tangent of that triangle is going to be a distance out of the corner of 1924 feet; that if you take that tangent of the triangle for the proposed unorthodox well location, it's 1658 feet, the difference of which is 353 feet. You divide that by 1924 and you get an 18-percent penalty for a direct encroachment.

The Commission order says you divide it in half

because of the mathematical conditions of the diagonal offset. That is set forth in this order. It shows it over in Finding Number 19 of page 4. It says mathematical computations show that approximately two times as much direct offset acreage is affected by drainage as a diagonal, and so they chose to multiply that penalty by a factor of 50 percent.

In my opinion, that's how you resolve this case, Mr. Examiner.

You may choose, if you want to, to look at the individual reservoirs for which there is some potential competition. If you believe Mr. Elger and you adopt his reservoir analysis under the early middle Morrow analysis, the yellow -- the orange display, it's his conclusion that small changes of structure and thickness are significant. When you're trying to find remaining production in the section that's this difficult to achieve, we've got all of these wellbores all over the place, and yet everybody's in agreement that there's additional gas to find, it's just where you put it and how you get it.

So the small differences in structure and location are incredibly important here. Sometimes they're not. They're important to Mr. Elger. He believes they're essential for this location.

If you believe his location of the gas-water

contact, then you will condemn Section 4. There is no competition with whatever may left be productive out of that small little wedge in the southeast corner which cannot and will not be produced by Read and Stevens. So if you accept his geology, then you may also choose not to apply the penalty as to that sand package.

If you look at the yellow sand package, which is the late middle Morrow -- it's Mr. Brannigan's isopach on the "B" -- you may conclude that there may be some opportunity for competition, whatever it may be. They have greater thickness. We are still at an advantage of being downstructure and less feet of pay.

It's an interesting oddity about whether or not this "B" sand is very productive. It's odd in how Read and Stevens went about the fact that prior to February they were producing the "A" and the "B" together and getting about 560 MCF a day; they add the upper Morrow, and it bumps up to 1.5 million a day.

You can draw some conclusions, but I think all you do is speculate on how the drainage patterns are going to be realized between those wells. There may be or may not be any competition. And if you're to apply a penalty, that's the likely reservoir where there may be some competition. And if it's perceived that the location has some advantage, then we ask you to abide by the precedent

the Commission established when they issued Order Number 9050-C, and that would be my recommendation about how you resolve the impossible task of coming to a decision with regards to geology that has such a substantial difference of opinion attached to it by experts in this area for which there is no agreement.

Thank you.

EXAMINER CATANACH: Thank you, Mr. Kellahin.

Can I get you two parties to submit draft orders in this case --

MR. KELLAHIN: Yes, sir.

EXAMINER CATANACH: -- in, say, two weeks?

MR. KELLAHIN: Yes, sir.

EXAMINER CATANACH: All right. There being nothing further in this case, Case 11,481 will be taken under advisement.

MR. KELLAHIN: Oh, I'm sorry. I apologize. My friend from Mallon that sat here all day would like to make a short statement. We did call for statements.

EXAMINER CATANACH: Oh, okay, we'll allow Mallon to make a statement in this case at this time.

MR. JONES: Mr. Examiner, my name is Ray Jones. I'm Vice President of Engineering with Mallon Oil Company.

Mallon has interests in the South Carlsbad Whites City area, and specifically we have an interest in Section

3, Section 9 and Section 10 of the area that's been in review today. We have reviewed this internally as a potential prospect, and as Mr. Gray said earlier this morning, that we are with Nearburg in our eagerness to drill a well in the northwest quarter of Section 10.

One of the key items that we feel is that these certainly are not simple reservoirs. They're separate reservoirs, as has been discussed, as everybody has agreed.

We feel that the DSTs on the well in the west half of Section 10 are very important. We feel that the depletion of those DSTs is significant. It would be indicative of a limited reservoir. Internally, we have determined that we don't consider that a good place to prospect. We're not in business to drill limited reservoirs.

And therefore, we support the geology presented by Nearburg for the location in the northern portion of the west half of the section. And so we would like to see the location approved as applied for and would request that.

EXAMINER CATANACH: Thank you, Mr. Jones.

There being nothing further now, this case will be taken under advisement.

(Thereupon, these proceedings were concluded at 12:55 p.m.)

* * *

CERTIFICATE OF REPORTER

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

I, Steven T. Brenner, Certified Court Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I transcribed my notes; and that the foregoing is a true and accurate record of the proceedings.

I FURTHER CERTIFY that I am not a relative or employee of any of the parties or attorneys involved in this matter and that I have no personal interest in the final disposition of this matter.

WITNESS MY HAND AND SEAL April 24th, 1996.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1998

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 11461, heard by me on April 1996.

David R. Catanach, Examiner
Oil Conservation Division