STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

ORIGINAL

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

CASE NO. 14116

APPLICATION OF FASKEN OIL & RANCH Ltd., FOR AN ORDER AUTHORIZING AN ADDITIONAL WELL IN THE "POTASH AREA" AT AN UNORTHODOX WELL LOCATION, LEA COUNTY, NEW MEXICO

REPORTER'S TRANSCRIPT OF PROCEEDINGS

SPECIAL EXAMINER HEARING

BEFORE: DAVID K. BROOKS, Legal Examiner
TERRY WARNELL, Technical Examiner

June 27, 2008

Santa Fe, New Mexico

This matter came for hearing before the New Mexico Oil Conservation Division, DAVID K. BROOKS, Legal Examiner, and TERRY WARNELL, Technical Examiner, on June 27, 2008, at the New Mexico Energy, Minerals and Natural Resources Department, 1220 South St. Francis Drive, Room 102, Santa Fe, New Mexico.

REPORTED BY: JOYCE D. CALVERT, P-03
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A P P E A R A N C E S

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ALSO PRESENT:

Robert P. Jornayvaz III, Intrepid Potash
Jimmy D. Carlile, Fasken Oil & Ranch, Limited

MR. BROOKS: We'll go on the record and call to order Docket No. 21-08, Special Examiner Hearing for the New Mexico Oil Conservation Division. I'm David Brooks, presiding examiner for this docket and legal Examiner, and with me is Terry Warnell, technical examiner.

This docket has been called pursuant to a special setting for Case No. 14116. So at this time, we'll call Case No. 14116, Application of Fasken Oil and Ranch Limited for an Order Authoring the Drilling of an Additional Well at an Unorthodox Location in the Potash Area, Lea County, New Mexico.

Call for appearances.

MR. FELDEWERT: If it pleases the Examiner, Michael Feldewert with the Santa Fe office of the law firm of Holland and Heart appearing on behalf of Fasken Oil and Ranch, Limited. I have three witnesses today.

MR. MANGES: Joseph Manges, Mr. Examiner, of the Comeau firm for Intrepid and we have four witnesses. And with me is Jim Cress with Holme, Roberts and Owen.

MR. BROOKS: Okay. Will the witnesses please stand, please identify yourselves for the court reporter, beginning with the gentlemen over behind the board here.

MR. HARVEY: Yes. I'm Hugh Harvey. I'm executive vice president of technology for Intrepid Potash, Inc.

MR. LEWIS: I'm James Lewis with Intrepid, chief geologist.

MR. TAYLOR: Ken Taylor, manager of financial planning with Intrepid Potash.

MR. VAN SAMBEEK: Leo Van Sambeek with RESPEC Engineering out of Rapid City, South Dakota, mining engineer.

MR. WORRALL: John Worrall, geologist.

MR. TAYLOR: Tommy Taylor, drilling manager for Fasken Oil and Ranch.

MS. KVASNICKA: Sally Kvasnicka, land manager for Fasken Oil and Ranch.

MR. BROOKS: Very good. Will the court reporter please swear the witnesses?

[Witnesses sworn.]

MR. BROOKS: We need to take up what I believe is the request of Intrepid that certain portions of the proceedings be conducted as confidential. And this is actually the first hearing I've participated in where this has been an issue, but there is a statute that provides for confidentiality.

So the parties will need to designate for the court reporter the evidence that is confidential in nature so that it can be sealed and a separate record made up of the sealed evidence. Is there anyone -- well, I know someone did just walk in. I was going to say is there anyone present who is not an employee of Fasken, Intrepid or the department or their counsel. And I know you are --

KATE: I'm here for R.W. Byram's. And if it's going

to be confidential, I can simply report that.

MR. BROOKS: The proceedings are not except for that evidence that will be designated as confidential. So I just wanted to establish that. When we close the proceedings, we'll let you know. Anyone else who's here who is not --

UNIDENTIFIED WITNESS: We're both working interest owners of the Fasken well that's proposed.

MR. BROOKS: Okay. Very good.

MR. FELDEWERT: Mr. Examiner, I would like to, for purposes of just the record, lodge, I guess, an objection, having not seen what's involved. I've looked at the statute and I do not read the statute 71-1-8 as authoring the sealing or maintaining confidential status over information that is used in a public hearing.

I think the statute indicates that it does not prevent or apply to proceedings that are set for hearing. It only deals with information that the Energy Minerals and Natural Resources Department received under its normal course of business. It does reference the fact that they can close any part of the meeting where confidential information is covered. But when it comes to a public hearing in a public forum, it's our position that that information that you put out as part of your exhibits or your testimony is part of the public record, absent extraordinary circumstances.

MR. BROOKS: Well, the statute is somewhat unclear on

that subject. I had not realized that there was going to be a controversy about it. I will make a ruling when we get to that portion of the proceedings.

MR. MANGES: May I respond?

MR. BROOKS: Yes, sir.

MR. MANGES: New Mexico has adopted a trade secret act which protects confidential information, generally. The Legislature enacted that, 573A-1. That's been interpreted in the Pinchera case to include confidential proprietary information. And there's also a rule of evidence, Rule 11508 regarding trade secrets, which was enacted and approved by the supreme court, which also protects confidential proprietary information.

I would be happy to go through and prove every element of those rules and of the Uniform Trade Secret Act at the appropriate time, Your Honor.

MR. FELDEWERT: I should say, Mr. Examiner, just for purposes of conducting the hearing, if it involved trade secrets, that's one thing. The problem I have is that I'm not sure what they are going to designate as confidential because virtually everything they produced to us they say "confidential." A lot of it is not trade secret, so I think it's going to be a document-by-document issue. There obviously will be some that we do not object to.

MR. BROOKS: Well, of course, dealing with it on a

document-by-document basis will make it more complex and take more time, but we will attempt to do what we have to do.

Speaking of timing, do the parties have estimates as to how long they expect the case to last?

MR. FELDEWERT: Mr. Examiner, we have three witnesses. I suspect my examination of those witnesses will take no longer than an hour and a half.

MR. BROOKS: Okay. How long do you expect your case-in-chief will take?

MR. MANGES: I would fully expect to take four to five hours on four witnesses.

MR. BROOKS: Okay. In the interest of not taking any longer than is actually necessary with this proceeding, I don't know if it's going to be -- I don't know if it's going to be necessary to limit time in this proceeding, but I never know at the beginning of a proceeding. And if you don't do so at the beginning of the proceeding, it's not fair to everyone.

So I want to get through with this hearing no later than Monday evening. And that will be difficult to do if we go unlimited time if the cases start running longer than anticipated. Based on the time estimates that have been given, I would believe that allowing each party seven hours total to present their case. That is, to present their case and cross-examine the opposing witnesses should be adequate.

If it becomes apparent later that it's inadequate, I

would extend it, but I will extend each party's time by the same amount. If we do extend it, though, it's going to be very difficult to finish by Monday evening. So I would hope not to have to do that. We'll start on a seven hours per side basis and proceed from there.

Do the attorneys wish to make opening statements?

MR. FELDEWERT: Mr. Examiner, I have a brief opening statement.

MR. BROOKS: Okay. You may proceed.

MR. FELDEWERT: Mr. Examiner, Mr. Warnell, in 2003 at Fasken's request, the Division addressed a propriety of continued oil and gas development in Section 16. The potash companies at that time had an opportunity to participate in those hearings. The Division took evidence on the extensive oil and gas development in Section 16, noted the existence of 19 well bores, applied R 111-P, and determined -- if you look at Exhibit 3 in our notebook, I can read it out loud. But their finding in Paragraph 14 in Fasken's Exhibit 3, which is the Division's order -- the evidence establishes that it is highly unlikely that commercial potash mining will take place in Section 16.

Now, Fasken's deep gas well in the east half of Section 16 that was drilled pursuant to this Division order was a success. And Fasken now seeks approval and has filed an APD to continue its orderly development of this section with a gas

well in the west half of Section 16. And Intrepid has now, surprisingly, objected. It's not clear why. Their pre-hearing statement suggests that somehow the facts have changed, that the potash prices are now higher, they have their concerns about safety. So I've got to present some kind of a case today to demonstrate why the Division's findings should be overturned and why this well should be denied.

But I suggest that the legal framework for this matter was recently clarified by Judge Sanchez. And if I may approach, Mr. Examiner -- we're not going to go through the entire aspect of his order, but I did highlight a certain provision that I think is important here today, and it appears on Page 13 of Judge Sanchez' May 2008 opinion.

And the first thing I think that is important is at the top he notes that the Oil and Gas Act does not indicate that preventing waste of potash trumps preventing oil and gas waste. Essentially, you treat the two resources equally. That's what the Oil and Gas Act says. What's important is at the bottom as well, and I'm going to read the first few sentences.

He says in Subsection F of Section 70-2-3 provides a definition of waste that, like the other definitions, should guide the Commission's decision-making process. That provision defines waste as" -- and now he's quoting -- "drilling or producing operations for oil and gas within any other

containing commercial deposits of potash" -- which I think is important -- "where such operations would have the effect" -- and he says -- he highlights -- "unduly to reduce the total quantity of such commercial deposits of potash which may reasonably be recovered in commercial quantities or where such operations would interfere unduly" -- and again he emphasizes that word -- "with the orderly commercial development of such potash deposits."

And then he goes on to discuss the Legislature's use of those terms within the statute. So I submit to you that what the statute requires is protection of both resources where it's possible. You don't favor one over the other. They are treated equally with the primary goal of preventing undue waste of either resource.

Now, in 2003, the Division did this weighing, and they determined it was highly unlikely that commercial potash mining is going to take place in this section. And they allowed oil and gas development to continue in this section.

So today, it seems to me, that Intrepid has the burden of demonstrating why this finding should now be rejected. They have to carry essentially three burdens here. They have to show that there are commercial quantities of potash in Section 16, that can be, secondly, reasonably recovered. And finally, they have to show that this allowing oil and gas development to continue will unduly interfere with

the recovery of any commercial quantities of potash.

Now, what we're going to show you here today is first of all, there are recoverable oil and gas reserves in the northwest quarter of Section 16 that will not be recovered by the existing well in the southwest quarter -- or southeast quarter of Section 16. If we're going to recover those reserves, we have to recover them now. Because it is undisputed that you cannot drill these deep wells after there has been potash mining. You have the subsidence, you have the caverns. And our drilling engineer is going to testify you cannot drill through that.

The commission itself in the Bass and Devon decisions which resulted in Judge Sanchez' order itself recognized that oil and gas drilling cannot occur once you have potash mining. So essentially, if we don't drill now, if we don't allow this development to continue, we know what we're going to have. We're going to waste these oil and gas reserves.

The second thing we're going to show you is Intrepid has no lease in Section 16. They got no right to mine there. In 2003 at the time that the Division was entering its decision, the State Land Office made its own independent determination that it was not in the best interests of the trust to issue a potash lease for Section 16, and they determined that oil and gas development should continue in that section.

MR. BROOKS: In Section 16 in the buffer zone?

MR. FELDEWERT: Section 16 is outside of their life-of-mine reserves.

MR. BROOKS: But is it in the buffer zone?

MR. FELDEWERT: I've seen a map. I think part of it may be in a buffer zone.

MR. BROOKS: Okay. Go ahead.

MR. FELDEWERT: Of course, I'm still trying to figure out what those maps mean. But the State Land Office certainly -- what they determined was it was better to allow oil and gas development to continue in this section and they have reaped the reward of that. They have received substantial royalties and taxes as a result of the continued development of oil and gas here.

Third, we're going to show you Intrepid has no mining plans for Section 16. Their north mine in this area has been closed since the early 1980's. They're only now thinking, they're thinking about opening it. And their primary development focus now is on other areas far from Section 16. We're going to show you that.

Finally, we're going to show you that when you apply what the potash companies have described as the rule of thumb safety pillars within R-111-P, and I'm talking about the 1/4 mile for shallow wells and the 1/2 mile radius for deep gas wells, that most of Section 16 is covered with safety pillars.

Therefore, we submit oil and gas development should continue in this particular section with the understanding that the plugging requirements in R-111-P will certainly take place here to allow potash mining, whatever mining they think they can now do after the oil and gas has been recovered. We don't need to sacrifice either resource here.

Now, Section 16 is a rather unique section. We have an extensive number of well bores. We have an existing deep gas well. We have a likelihood of additional recoverable oil and reserves. We had a second deep well that was drilled in this section that was a dry hole. So it is a unique section. So there's not, you know, in terms of precedent, we're talking about here just Section 16.

And like I indicated, it seems to me what I would call a win/win scenario is that you allow continued oil and gas development to occur, complete those reservoirs first, you properly plug the Fasken wells and then you allow the potash mining companies to come in and see whatever -- determine whether they can mine around the already existing well bore that sit there in Section 16. That's what the Division determined in 2003. And that's what the State Land Office determined in 2003 to be in the best interests of the trust.

Now, I want to make two points about Intrepid's case real quick. As I understand it from their exhibits, they seem to be suggesting that they may be able to mine closer to these

existing 19 well bores than the 1/4 mile rule-of-thumb pillar that they have always thrown out and relied upon in R-111-P. And I don't know if they're suggesting now that we should do away with these 1/4 mile pillars, or whether they're looking to revisit R-111-P. I'm not quite sure.

But it seems to me -- and I hope the potash industry can suddenly at some point in time mine closer to these existing well bores in Section 16 -- but the point to keep in mind is they're not prepared to do that yet. They don't have a lease. They don't have a plan. They haven't filed anything with the federal or state agencies indicating a desire to mine or to put together a mining plan for Section 16.

So what we have at most is a potential mining opportunity at some unknown point in time. And to me, I would submit, that's not sufficient to suddenly interrupt the oil and gas development in this Section 16.

The second thing is it looks to me like with all these witnesses and all these exhibits and all these big blowups is that they're going to talk about safety issues ad nauseam. Now, we're all concerned about safety. And that's why we have R-111-P. That's why we have these 1/2 mile pillars, radius pillars. That's why we have these 1/4 mile pillars. They address those safety concerns. Until we get to a point where we have better information from a more comprehensive study -- we don't have that yet. What we have is

R-111-P. It addresses the safety issues and that's what governs here.

So I submit to you for this unique section of land with 19 existing well bores, with an existing producing deep gas well, that there is no reason to waste the oil and gas reserves in the west half of Section 16 by suddenly halting this development. And that the win/win scenario here is what the State Land Office determined in 2003, and that is you allow oil and gas development to continue. Potash companies can go off and focus on the other areas that they're focused on already. And we're finished with the oil and gas development in Section 16, they can come in and mine however close they think they can get to the existing well bores that are already there.

MR. BROOKS: Thank you. Mr. Manges?

MR. MANGES: Mr. Examiner --

MR. BROOKS: I will note that I'm not including opening statement in the time since I said it was to present your case, so I haven't started the clock yet. You may go ahead.

MR. MANGES: I'll take longer, then.

MR. BROOKS: Well, I would appreciate if it you didn't, but --

MR. MANGES: A short one. Could you hand the Examiner the exhibits?

And, Mr. Examiner, we're going to hand you Intrepid's original exhibits. And let me briefly respond to a couple of the points made by counsel.

MR. BROOKS: Do you have an extra one of these notebooks, because we have to leave the originals for the court reporter. And then we'll need --

MR. MANGES: Yes, we do.

MR. BROOKS: I will look on the original exhibits. If you have an additional one, then Mr. Warnell can read from that. I think Mr. Warnell needs a copy of each party's exhibits since he's also an Examiner. Do you have another copy, Mr. Feldewert?

MR. FELDEWERT: Can he use the record exhibits, or do you want to have a second --

MR. BROOKS: One of us can use the record exhibits, yes.

MR. FELDEWERT: I do have a notebook over here, if I may step over.

MR. BROOKS: Okay. Sure. One of us can use the record exhibits. There's no problem with that because the court reporter doesn't need them until the hearing is completed. As long as we remember not to write notes on them.

MR. MANGES: Mr. Examiner, times have and are changing. You will hear evidence put on by Intrepid that potash prices are at a record high right now. From the time we

prepared our exhibits in this matter to today, they've gone up $40, so our exhibits are already dated.

We prepared those exhibits when potash was $532 a ton. Now they're $582 a ton. So the economics have changed. Potash prices are at record highs, and we'll show that Section 16 has commercial-grade potash, that it's prudent to mine it. And through our witnesses, that if this APD is approved, it will result in a waste of potash, a tremendous amount of waste of potash. The exact number I don't want to go into because they involve astronomical figures -- in the hundreds of thousands, hundreds of millions of dollars of waste.

Intrepid owns four potash mines in New Mexico. Two are operating. One is in the process of becoming an in situ mine, and one is the north mine which is the mine at issue here, currently idled. We will show that it's -- as we speak, Intrepid is evaluating reopening that mine because of the changed economic conditions in the potash industry.

But really, this case is quite simple. The proposed APD here is located within Intrepid -- 1/2 mile of Intrepid's life-of-mine reserves. It is located within the buffer zone under R-111-P. That's it. We should be able to go home.

R-111-P, in the order section which is not the findings, but the very order, says that, "Applications to drill outside the LMR will be approved providing there is no protest

from the potash lessee within 20 days of the notice." But it says, "A deep well shall be drilled no closer than 1/2 mile from the LMR."

All of Section 16 is within Intrepid's LMR -- or pardon me -- within the buffer zone of Intrepid's LMR. So once we have established that, this APD has to be denied. And that is the easy answer to this case. Mr. Feldewert mentioned that he thought Intrepid had the burden of proof and that's plainly not correct. Under R-111-P, finding 20, reads as follows: "The Commission cannot abdicate its discretion to consider applications to drill as exceptions to its rules and orders. But in the interest of preventing waste to potash, to deny any application to drill in commercial potash areas as recommended in the work committee report, unless a clear demonstration is made that commercial potash will not be wasted unduly as a result of the drilling of the well."

So the clear demonstration is not Intrepid's duty, but rather the burden is on the application in this case, Fasken.

MR. BROOKS: Well -- are you through?

MR. MANGES: I'm getting there, though.

MR. BROOKS: Okay. Go ahead. I won't make any comments until you conclude.

MR. MANGES: So we'll show that it is undisputed that it is within the buffer zone. We'll also have Jim Lewis who is

a geologist, an oil and gas geologist, as well as a potash geologist show that this is located within both the BLM measured ore reserve -- and that's not Exhibit 1 within the blue area, which is measured ore by the BLM -- but it's also commercial grade as measured by Intrepid, and that will come in the closed part of this hearing because the values are so high and it is proprietary information.

We'll show that because of that, if this APD is drilled, Intrepid will basically be precluded from being able to mine a tremendous amount of potash and it will be wasted. And that relates to the 1/2 mile safety pillar that Intrepid will honor. And there is a distinction here that this case will draw, and we'll point this out to you. And that is that there's a difference between an active oil and gas well and one that's been abandoned and properly plugged. There's a huge difference.

Intrepid will show that any potash company will stay away from an active deep gas well. The danger is high for active deep gas wells. But on the other hand, Section 16 has a number of shallow plugged old oil wells. Those, in Intrepid's judgment, present less of a hazard to the underground mine, to the miners, and to the potash reserves. And we'll show through our expert testimony here that it is possible given the right circumstances, given the right assumptions, to mine closer than the 1/4 mile pillar that is left for active wells.

As far as the north mine goes, Intrepid will show that it is as we speak conducting feasibility studies to reopen that mine. There's a worldwide shortage of potash. The north mine is a facility that can be reopened at relatively less expense than opening a brand new mine. And that's going to happen. Intrepid will show that it's very likely in the foreseeable future that the north mine will be reopened if the feasibility studies so dictate.

We will go through and show how Section 16 relates to the other potash holdings in the area. It's obviously right in the middle of the blue zone, which is measured ore, but it also is an area that is surrounded by Intrepid's other lease holdings.

We'll show that we have made an application for lease at the State Land Office that is pending for Section 16. Our folks were down here yesterday meeting with the State Land Office, and that process is ongoing.

Finally, with respect to the 2003 case, that case stands for nothing. There was no potash company that appeared at the hearing. Intrepid certainly wasn't a party to that hearing. So none of those findings can be found to be binding on our client. Because the issue has not been litigated, if there is some sort of collateral estoppel or res judicata argument being made here, because the issue is not litigated, i.e., there's no opposing party, those findings cannot be used

against Intrepid here.

And finally, the circumstances have changed. Potash was approximately $100 a ton in 2003. It's $583 now and going up. And so every case has to be evaluated on its merits. And here, Section 16, we have to look at it anew given the new economic circumstances.

With respect to oil and gas being drilled first and then potash coming in, that ignores that Intrepid will have to leave a pillar and we'll show exactly what loss is involved with that pillar, and it's very substantial.

Finally, there is a study that's going on now being conducted by Sandia National Labs and the Bureau of Land Management. And I think the Oil Conservation Division and the State Land Office are both involved with that. And the subject of that study is to analyze the very issues we're going to be talking about here, and that is, how close can a potash mine be to an oil and gas well, and how close can these two resources coexist. That is a huge issue and we would suggest this that proceeding be either stayed or continued pending the resolution of that scientific study. Sandia National Labs is a well-known, well-respected organization. And this issue is huge. And there's a lot of dollars at stake here both ways.

So we think that because there's an ongoing study that's directly on point, it makes sense to pause and let the science be worked out. There may be some way that -- or the

results of that study may bear on what we're doing here.

But in lieu of that, we'll put on the case and show you exactly what's at stake. It's huge. Thank you.

MR. BROOKS: Thank you. The observation I would make is that -- well, Mr. Feldewert said that Judge Sanchez' order had clarified the rules. I agree that Judge Sanchez' order affects the rules that we will apply, but I'm not sure that they're clarified. If we did not have the benefit of Judge Sanchez' order, I would have taken the approach to this case that if the potash company demonstrates that the land is within the LMR or within the buffer zone, then the burden of proof shifts to the oil and gas company to prove that the requested drilling will not result in an undue waste of potash.

I am not sure if that implication, which I think was the Commission's interpretation of Rule 111-P in the last couple of decisions and the ones that were appealed to Judge Sanchez. I'm not sure if Judge Sanchez accepted the interpretation of R-111-P or if that was that the Commission had properly applied R-111-P in that way. So at this point, I believe that, from the witness lists and designations that have been filed, it is my assumption that both parties come here prepared to put on a case to prove their version of the facts in this case. And I think that is wise because I think at this point, at least in my mind, it is not clear where the burden of proof lies in this case.

With that, we will begin the presentation of the evidence. And, Mr. Feldewert, you may call your first witness and I will start the time running.

MR. FELDEWERT: Certainly. Mr. Examiner, we call Sally Kvasnicka.

SALLY KVASNICKA

after having been first duly sworn under oath,

was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. FELDEWERT:

Q. Would you please state your name for the record.

A. My name is Sally Kvasnicka.

Q. Where do you reside?

A. I reside in Midland, Texas.

Q. And by whom are you employed and in what capacity?

A. I'm employed by Fasken Oil and Ranch, Limited as the land manager.

Q. Have you previously testified before this Division?

A. Yes, I have.

Q. Did you testify at the 2003 hearing when the Division approved the well in Section 16?

A. Yes, I did.

Q. And at the time of that testimony, were your

credentials as an expert in petroleum land matters accepted and made a matter of record?

A. Yes, they were.

Q. Are you familiar with the application that Fasken has filed in this case?

A. Yes.

Q. And have you studied them or are you familiar with the status of the lands in the area?

A. Yes, I am.

MR. FELDEWERT: I tender Ms. Kvasnicka as an expert witness on petroleum land matters.

MR. BROOKS: Any objection?

MR. MANGES: No objections.

MR. BROOKS: So qualified.

Q. (By Mr. Feldewert): Would you briefly state what Fasken seeks with this application?

A. We seek the approval to drill our Laguna 16 No. 2 Well in the southeast quarter of the northwest quarter of Section 16, which is Unit F in Township 20 South, Range 32 East, Lea County, New Mexico. And this is at an unorthodox well location of 2135 feet from the north line and 2455 feet from the west line.

MR. BROOKS: Let me interrupt at this point. Mr. Feldewert, are you going to present your -- do you have a basis for the unorthodox location at this hearing, or are you

going to file a separate administrative application for that?

MR. FELDEWERT: We will present it at this hearing, Mr. Examiner.

MR. BROOKS: Okay. Very good.

Q. (By Mr. Feldewert): Ms. Kvasnicka, the footage that you just gave, is that different from the APD that was filed and rejected by the Division?

A. Yes, it is.

Q. Okay.

A. It was -- we've -- yes. It's different.

Q. I believe we'll get into why it was moved, but I wanted the make sure that the examiners are clear as to what that footage is. Could you repeat that, please?

A. The footage?

Q. Yes.

A. 2135 feet from the north line, 2455 feet from the west line of Section 16.

Q. Okay. Now, this would be the second deep gas well in this section, would it not?

A. That's correct.

Q. And your initial application for a permit to drill this proposed well was denied by the district office?

A. That's correct.

Q. Do you recall why it was denied?

A. It was denied because it was within -- it was

denied because Intrepid filed an objection.

Q. Okay. And now so we have two primary issues as to this well, as Mr. Brooks pointed out. We seek an order directing the district office to approve a well in the northwest quarter, correct?

A. Yes.

Q. And we also request an order approving an unorthodox well location?

A. That's correct.

Q. Why don't you, then, orient the Examiner by turning to Fasken's Exhibit No. 1 and describe that, please.

A. Exhibit No. 1 shows our -- the nine section area around our Section 16 with 16 being the middle. Intrepid potash holds the acreage outlined in red. Mosaic holds the two sections outlined in blue to the east of our Section 16.

Q. Now, has Mosaic Potash, did they file any objection to the proposed well?

A. No, they did not.

Q. And now, what does the yellow show?

A. The yellow shows unleased potash minerals.

Q. So that includes Section 16 and --

A. 16 and 21.

Q. -- to the south?

A. Uh-huh.

Q. Now, is Intrepid the successor to Mississippi

Potash?

A. Yes, they are.

Q. So in 2003, when the Division approved the first well, was Intrepid's predecessor provided notices of that hearing?

A. Yes, they were.

Q. And Mosaic is the successor to IMC; is that correct?

A. Yes, they are.

Q. And at the 2003 hearing -- prior to that hearing, was notice provided to IMC?

A. Yes.

Q. And they filed an objection?

A. Yes, they did.

Q. And that was the reason why we had a hearing in 2003?

A. That was the reason why there was a hearing. They didn't appear, but there was a hearing.

Q. Now, why don't you turn to -- before we get there, was that -- we need to get this on the record.

The well that was approved in 2003 by the Division, was that successfully drilled to the Morrow?

A. Yes, it was. And it's been producing from 19 -- excuse me 2004 -- to present.

Q. And is that shows in those Exhibit 1?

A. Yes. If you look at the very southeast of the southeast quarter of Section 16, that is our existing gas well producing from the Morrow and Strawn.

Q. Okay. Why don't you then turn to Fasken Exhibit No. 2 and explain that to the Examiner, please. What are you showing here?

A. We're showing all of the well bores that have been drilled in Section 16 and the adjacent sections surrounding 16. Our well bores you'll see in the very southeast/southeast of the section. And our proposed location is the circle in the southeast of the northwest.

Q. Okay. Now, is this the same exhibit that was used in the summer of 2000 -- or in the 2003 hearing?

A. Yes, with the exception of adding our location for our No. 1 well in the southeast.

Q. Okay. And then you added the proposed location on here as well?

A. Yes. And we've added that proposed location.

Q. All right. Now, what I'd like to do is to turn to Fasken Exhibit No. 3. This is the order that was approved that was entered by the Division in September of 2003 involving the Laguna No. 1; is that correct?

A. Yes, it is.

Q. All right. Now, using this exhibit, I'd like to just go through some of the findings because I want to see if

anything has changed, okay?

A. All right.

Q. Okay. Now, if we go to Paragraph 9, which is on the second page of this order, Paragraph 9A notes that there are no Potash leases in Section 16 or 21. And that is still the case today?

A. That is correct.

Q. Paragraph B noted that Mississippi Potash held the leases in Sections 8, 9, 10, 17, and 20. Those leases are now held by their successor, Intrepid?

A. Yes, they are.

Q. All right. Subsection C notes that there is a mine to the north of your proposed well location, and that it was inactive. Is that still the case today? Is that mine to the north of Section 16 still inactive?

A. Yes, it is.

Q. Who owned that mine in 2003?

A. It was Mississippi, and it's now owned by Intrepid.

Q. And that mine has been closed for how long?

A. Since the early '80s.

Q. If we then flip over to the next page, there's another Paragraph 9C -- which obviously does flow, so we'll call that 9C-the-second. It notes that IMC held potash leases in Sections 15 and 22.

A. That's correct.

Q. And now it's Mosaic that holds those leases as the successor to IMC?

A. Yes, it is.

Q. And again, they have not filed -- they filed an objection to your initial well, right?

A. They did, but they have not filed an objection to our proposed well.

Q. Okay.

A. And I think also that IMC has held those leases or its successor since 1953 when it was developed.

Q. You're right. Because if we look at Paragraph 9D, we note that those leases have been held for quite some time. Is that without any development?

A. Yes.

Q. Okay. And then in Paragraph 9E, it says the nearest active potash mine is approximately eight miles to the southwest of your proposed well location. Are you aware of any facts to indicate any change in the location of the nearest active mine?

A. No. I'm not aware of any changes.

Q. Then in Paragraph 9F, it notes that the State Land Office denied a request for a potash lease in Section 16. Do you see that?

A. Yes, I do.

Q. Can you read what the Division quotes there?

A. "Section 16 currently has numerous oil and gas well bores and with the potential of additional drilling, there does not appear to be adequate clearance for economic mining."

Q. Okay. Now, with the drilling of the Laguna No. 1 in 2003, there are how many well bores there?

A. There are 19 well bores that have penetrated the potash in Section 16.

Q. Okay. Now, if I go down to Paragraph 9 -- or 10A, continuing with this order -- I got ahead of myself. It notes there are 18 well bores, and as you testified, there's now 19.

A. Yes.

Q. All right. Then I think the other finding that is of significance is that if you go down to Paragraph 10D in this order, it notes that there are at least four well bores in the south half of the south half of the adjacent Section 9, correct?

A. That's correct.

Q. And if you turn over to Exhibit 2, turn back to Exhibit 2, they're talking about the four well bores shown in your exhibit.

A. That's correct.

Q. Up at the top?

A. Yes.

Q. Now, can we stay on this Exhibit No. 2 for a minute, please?

A. Okay.

Q. Is there -- do you also show a well bore in the offsetting Section 17 right near the section line?

A. Yes, it's a very -- yes.

Q. And then you show a well bore in the southeast quarter of the southeast quarter of the offsetting --

A. Section 8.

Q. -- Section 8, right?

A. Uh-huh.

Q. To the north and to the east. All right. Now, if we go back to this order and go to Paragraph 12, you testified that IMC filed an objection but apparently IMC did not appear at the hearing.

A. That's correct.

Q. Now, what was Mississippi Potash's position? Now, they are Intrepid's predecessor. What was their position in 2003 with respect to the potential development on Section 16?

MR. MANGES: Objection. Hearsay. And I don't think it's relevant to this proceeding. And they can call a Mississippi Chemical representative if they're going to quote them.

MR. BROOKS: Overrule the objection. Go ahead.

THE WITNESS: It was Mississippi's position that -- well, one, they didn't -- excuse me -- Mosaic didn't appear. And Mississippi had no plans to mine in Section 16 due to the extensive oil and gas development in the area, the 18 wells that had been drilled through the Section 16 in the potash.

Q. (By Mr. Feldewert): And is that reflected in the Division's findings?

A. Yes, it is.

Q. Which paragraph?

A. It is Paragraph No. 14.

Q. Sorry, paragraph?

A. Paragraph 13 and 14.

Q. Okay. All right. So in 2003, we have Intrepid's predecessor indicating that they had no plans to develop Section 16. And then IMC initially objected but they didn't show up at hearing?

A. That's correct.

Q. And we've already read for the record the finding by the Division in Paragraph 14, so we won't go through that again.

But focusing on that finding about the fact that it is highly unlike that commercial potash mining would take place in Section 16, do you have any additional information or analysis that further supports this finding made by the Division?

MR. MANGES: Objection. Your Honor, this witness isn't qualified to testify. She's a landman and we're talking -- the question goes to whether there's commercial potash or anything else pertaining to Section 16.

MR. BROOKS: Well, the objection is well taken if the witness is giving opinions. But the question was just did you have any information and it doesn't call for an opinion. So on that basis, I'll overrule the objection. The witness can testify as to whether they have information on the subject, understanding that the technical witnesses will have to testify as to their opinions.

THE WITNESS: Yes, we do have additional information.

Q. (By Mr. Feldewert): What did you do?

A. Well, we've read portions of the testimony from Dan Morehouse in a Commission finding.

Q. Which case was that?

A. That was Case 13367, the Bass and Devon applications.

Q. Is that marked as Fasken's Exhibit No. 4?

A. Yes, it is.

Q. And what does -- now, who is Mr. Morehouse?

A. Mr. Morehouse testified on behalf of Mosaic Potash in June of 2006 for R-111-P --

Q. All right.

A. And he stated that --

MR. MANGES: Objection, Your Honor, this is hearsay, again. Now we have one witness testifying about what another witness said in a hearing. The groundwork for this hearing is a separate case. I don't know the relevance to Section 16 here. But certainly, there's got to be some connection between another totally different OCD hearing and what's going on in this case.

MR. BROOKS: As I understand it, Mosaic and Intrepid are not affiliated, correct?

MR. MANGES: No, they are not.

MR. BROOKS: That was my understanding. Do you want to respond, Mr. Feldewert?

MR. FELDEWERT: We're trying to set up the basis for a subsequent exhibit.

MR. BROOKS: Is that Exhibit 4 that you're --

MR. FELDEWERT: Exhibit 4 that we're looking at. Now, Mr. Examiner, I can read the testimony into the record.

MR. BROOKS: Well, it doesn't matter. I assume the objection is going to be the same whether you read it or whether the witness reads it.

MR. MANGES: I don't have an opportunity to cross-examine this person, Morehouse. It's totally unfair. Intrepid wasn't there. It was a different circumstance. We have due process rights here. I'm being denied the opportunity to present my case if he's doing it through another transcript.

MR. BROOKS: Okay. I will sustain the objection because my understanding is that transcripts of previous hearings are admissible for the purpose of the truth of the matter stated only if they're between the same parties.

Now, there is an OCD rule which says that the Division can take administrative notice of matters that are part of the Division record. But my understanding is that that would refer to the authentication of the exhibits, not the contents of them. So because that rule here clashes with a well-established rule of evidence, I'm going to sustain the objection to this testimony.

MR. FELDEWERT: Mr. Examiner, we are offering this for purposes of explaining the basis for a subsequent exhibit. So on that basis, it seems to me it is admissible. We're not offering it for the truth of the matter, but for the background information that went into the development of an exhibit.

MR. BROOKS: Well, of course, it can be admitted if it's not admitted for the truth of the matter stated. I'm not sure that I understand at this point what purpose it would serve other than for the truth of the matter stated.

I'm going to stick with my ruling sustaining the objection for the reason I said. However, we will allow you to proceed to make this a part of the record as though on the bill of exception. There's no -- bill of exception doesn't serve a purpose other than preserving the testimony for subsequent

re-examination by the Examiner in this type of case. Because since appeal from these proceedings is de novo, there will be no review of the Examiner's evidentiary rulings. But then by doing that, I can make this a part of the record so it can be considered for another purpose if it later is demonstrated that it's admissible for another purpose.

You may proceed.

Q. (By Mr. Feldewert): Ms. Kvasnicka, as part of your duties with Fasken, are you required to have an understanding of the safety pillars that are reflected in R-111-P?

A. Yes.

Q. And as part of your duties and work obligations for Fasken, have you read transcripts and other materials that reflect the position that potash companies have taken with respect to safety pillars in the potash area?

A. Yes, I have.

Q. Based on that understanding -- or based on reading those transcripts and your understanding of R-111-P, what has been traditionally recognized as a rule of thumb for maintaining safe distances under R-111-P?

A. A quarter mile safety buffer for shallow wells and a half-mile safety buffer for deep wells.

Q. Now, having this information, what did you do with this information?

A. Well, if you'll turn to our Exhibit 5.

Q. Would you like the Examiner to pull that out?

A. Please. If you would pull that out. And if you look at the first page of this exhibit, you'll see Section 16 in the middle and on 16 you'll see all of those well bores that have been drilled that are highlighted on our Exhibit 2. And we've -- for the shallow wells, we've circled and put a quarter mile circle around each one of the shallow wells.

Q. Now, you applied the rule of thumb under R-111-P?

A. Yes, the R-111-P.

Q. Okay.

A. The deep gas well in the southeast quarter of Section 16 is a half-mile buffer. And then our proposed location, it shows the red circle, a half-mile buffer.

Now, if you look at the second page of that exhibit, we've deleted all of the interior lines so you can see what the effect of oil and gas might have on potash with the buffers of a quarter mile for shallow and a half mile for deep wells.

Q. All right. So you have taken what you understand the potash companies to consider to be the rule of thumb with safety pillars and applied them to the well bores in Section 16?

A. Yes, we have.

Q. And that is reflected on Exhibit No. 5?

A. That is correct.

Q. And what does it show?

A. Well, it shows that there's a very small amount of potential potash outside of these safety buffers that could be mined in the very northwest --

MR. MANGES: Objection. This witness is testifying about potash that can be mined. She's not qualified to testify about potash that can be mined.

MR. BROOKS: I think we agree on that. However, what she's testifying to what the exhibit shows in accordance with the assumptions on which it is developed. So on that basis, I will overrule the objection.

Q. (By Mr. Feldewert): Why don't you testify to what the radius circles are?

A. The radius circles are -- again, show the half-mile buffer around our deep well and the quarter mile around the shallow well.

Q. It covers most --

A. It covers all or most of Section 16.

Q. All right. Now, is Section 16 State lands?

A. Yes, it is.

Q. Has the State Land Office issued a potash lease for Section 16?

A. No, they have not.

Q. Have you taken a look at the State Land Office records in connection with Section 16?

A. Yes, I have.

Q. And what has the State Land Office determined?

A. Well, the State Land Office has determined in 2003 that it was not in the best interests of the trust.

MR. MANGES: Objection, your Honor. This is hearsay. If they want to call somebody from the State Land Office, then I can cross-examine that person. But this is pure and simple hearsay. We object to the method by which this evidence is coming in.

MR. BROOKS: Okay. Are you going to present documentary evidence from the State Land Office?

MR. FELDEWERT: Yes.

MR. BROOKS: Okay. In that case -- with that understanding, I'll overrule the objection.

Q. (By Mr. Feldewert): Okay. Why don't you turn -- why don't we just turn to Exhibit 6, Fasken Exhibit 6.

A. And if you will look at that, you'll see where the potash application was denied by the Commission.

Q. What does it say?

A. It says that it was not in the best interests of the trust to grant the lease, and it was denied on January 24th, 2003.

Q. Okay. Now, that's the first page of this exhibit. What's the second page of this exhibit?

A. The second page of the exhibit is a letter from

Jami Bailey. In that point, she says that the lease --

Q. Hold on. Where are you?

A. I was reading in the -- towards the end of the paragraph, the sentence beginning, "However."

Q. Okay. Now, why don't you just read it.

A. "However, lease HP003 has been determined to be not in the best interests of the trust. Section 16 currently has numerous oil and gas well bores, and with the potential of additional drilling, there does not appear to be adequate clearance for economic mining. Therefore, HP003 is rejected."

Q. Have you pulled from Fasken records the amount of royalty and severance taxes that the State Land Office has received as a result of the Division's order allowing a deep gas well in the southeast quarter of Section 16?

A. Yes, I have. And if you'll look at Exhibit 7, this is a history of the revenues and taxes that Fasken has paid the State of New Mexico. The State has received its one sixth share of the royalties from first production through March of 2008. And that -- the total benefit to the State of New Mexico and Lea County through royalty and taxes paid has been $2,593.155.41, and that has been since February of 2004.

Q. Okay. I'd like to now turn to the issue of the unorthodox well location, okay?

A. All right.

Q. Have you -- first of all, in connection with

that, what did you understand to be Intrepid's initial concern with this well?

A. That it was within their LMR.

Q. Okay. And what was the other concern that they had?

A. Well, that there was no lease in Section 16.

Q. Now, is this location within their LMR? Do we know?

A. I'm not sure that we know from what's been presented.

Q. All right. Now, what did Intrepid say in their pre-hearing statement? What concern have they expressed there with respect to their idle north mine?

A. They were concerned that it was within close proximity of that idle north mine.

Q. Okay. And having gotten that pre-hearing statement, what did Fasken do with its well location?

A. Well, we moved it to the south and east. We met with our geologist and we determined that we could move it a few feet and outside of their half-mile buffer within that boundary of that idle north mine.

Q. So based on what they provided us, you found a location that was a half mile away from their idle north mine?

A. Yes. And we had to take into consideration not only the old abandoned well bores that are in that area, but

there's numerous pipelines that affect the surface that finding a surface location was difficult, but we were able to find one.

Q. Did you communicate this new location to Intrepid?

A. Yes, we have.

Q. What was their response?

A. They have responded that they still objected to our location, and they didn't want us to drill a well within the northwest quarter of Section 16.

Q. What did they want you to do?

A. They want us to drill a directional well from our pad in the southeast/southeast of Section 16.

Q. Okay. Is your unorthodox well location and your proposed location today for the purpose of moving the well to the point where it is over a half mile from their idle north mine?

A. Yes, it is.

Q. And it also takes into account the pipelines and the existing well bores in this immediate area?

A. Right. Which has caused a more unorthodox location.

Q. That's a good point. So you actually moved it to a more unorthodox location than it was originally?

A. That's right.

Q. Okay. Now, why don't you turn to Fasken's

Exhibit No. 8. Pull that out and just show the Examiner where your new location is and just kind of orient him in this map.

A. All right.

Q. First, before you do that, where did this map we're using come from?

A. It came from Intrepid. They presented this to us in a pre-hearing statement.

Q. Is this Exhibit A to their pre-hearing statement?

A. Yes, it was.

Q. This is their map?

A. This is their map.

Q. Okay. So what, then, did you do with -- what does this map now show?

A. The original map showed this hatched blue line or blue circle around our original location. You can see it as the circle in the center of that.

Q. It's the uncolored circle?

A. It's the uncolored circle.

Q. Right above the --

A. The small little circle right above the number two. You can see it right here.

Q. So just for the record, it's right above the Laguna 46 or something like that?

A. Yes.

Q. To the northwest of the red dot?

A. Uh-huh.

Q. Okay. That was the original.

A. That was the original location that we filed.

Q. You got their concern and you then moved your well location?

A. That's correct.

Q. And is that reflected on the red dot?

A. Yes, it is. That is our new location of 2,135 feet from the north line, and 2,455 feet from the west line is shown with the red dot.

Q. Okay. And then when you put your new location on their map and drew your half-mile circle, where did you end up?

A. Well, you can see that we are outside of the boundary of their mine. Our half-mile buffer is shown in the solid red circle.

Q. Okay. So you are over a half mile, then, from their idle north mine as depicted on their exhibit?

A. That's correct.

Q. On their map?

A. On their map.

Q. Okay. Is this location also over a mile from any mining plans that have been identified by Intrepid?

A. That they've presented, yes.

Q. Okay. Why don't we -- let's see. To make things easier, why don't we put this to the side and turn to Fasken

Exhibit No. 9. Is this a map that Intrepid produced pursuant to Fasken's subpoena?

A. Yes, it is.

Q. And what does it purport to show?

A. It purports to show in the red boxes and the red outlines their planned mine works.

Q. Okay. In red?

A. In red.

Q. And is your new location shown on this map?

A. Yes, it is.

Q. Okay. And is it more than a half a mile from any anticipated mining activities?

MR. MANGES: Mr. Examiner, I need to lodge an objection. We're getting into confidential information at this point. We provided these documents pursuant to a protective order that was entered by the Hearing Examiner. And everybody who looked at these had to sign acknowledgements, and at this point, these mine plans that were produced do fall within what we would consider to be propriety information.

I don't know how far Mr. Feldewert is going to go in this line, but at this point, if you're, Mike, going to -- Mike, do you have additional confidential information that you're going to be asking?

MR. FELDEWERT: I was finished. I was finished with using this map at this point in time.

MR. MANGES: Well, I would certainly request that the map be kept separate. And I don't know that you're going to introduce it into evidence.

MR. BROOKS: It hasn't been tendered yet. At the time that it is, then --

MR. FELDEWERT: I intend to tender it into evidence.

MR. BROOKS: Well, we can address these issues at the time that it's tendered into evidence. I will probably --

MR. FELDEWERT: I have one other point.

MR. BROOKS: Okay. Go ahead.

Q. (By Mr. Feldewert): On this map and what they indicate to us and what they produced pursuant to the subpoena is something that they call a confidential draft work in progress, correct?

A. Right. That's noted on the map.

Q. Okay. All right. I'd then like you to turn to Exhibit No. 8 out of the table. Would you then turn to Fasken Exhibit No. 10? Were these documents -- hold on.

MR. MANGES: Same objection here.

MR. FELDEWERT: I'm not going to ask it. I'm just -- well, what's your objection? I'm sorry.

MR. MANGES: Same. This is again a confidential mining plan that Intrepid produced pursuant to the protective order. I think the rest of Exhibit 10 is actually three pages of three different mine plans. They're filed as confidential

documents with the State as well.

MR. BROOKS: Okay. I will defer ruling on that until they're offered into evidence. We can rule on all those issues at that time.

Q. (By Mr. Feldewert): Thank you. Ms. Kvasnicka, the three maps that comprise Exhibit No. 10, were these the additional mining plans that were produced by Intrepid pursuant to our subpoena?

A. Yes, it is.

Q. And I know this map is hard to read, but do you see any projected activity in Section 16?

A. No, I do not.

MR. BROOKS: Where is Section 16 on this map? I haven't found it. Oh, I see you've got it in red; is that correct?

MR. FELDEWERT: No. Actually, Mr. Examiner, if I may explain. We did not deal with any of the colors here. But I think if you left out Exhibit 8, you'll see you can kind of orient yourself using the mine. So if you go to the middle of the map and go to the northeast, you'll see there's a little takeout point. That's right above the Section 16 number. So if I'm on the left side of the map, up towards the top, the last extension of the mine.

MR. BROOKS: Yeah.

MR. FELDEWERT: There's a 16 right below it. Right

here, Mr. Examiner, right here.

MR. BROOKS: Okay. So Section 16 over about two-thirds of the way across to the right, not the Section 16 about a third of the way across, left to right.

THE WITNESS: It's about six and a half miles to the east -- or to the west of the east boundary of the map.

MR. BROOKS: Okay. Thank you.

Q. (By Mr. Feldewert): And what we have here, Ms. Kvasnicka, is what they provided to us for filed mining plans for January of '06, January of '07, and January of '08, correct?

A. That's correct.

Q. And none of these maps show any purported activity in Section 16 that's at issue here?

A. That's correct.

Q. All right.

A. And if you look at the last exhibit, it actually shows their mining intentions through 2010. And they don't have any plan to mine for 2010 in Section 16.

Q. Okay. Then why don't we turn to Fasken Exhibit No. 11. This is the May 14th letter to Jimmy Carlile?

A. Yes, it is.

Q. And it came from Fasken's records?

A. It came from Fasken's records from IMC to Jimmy Carlile.

Q. And who is -- IMC was the holder of the potash leases in the adjacent sections what?

A. Fifteen and 22.

Q. I note that it says here 17 and 22, but that appears to be a typo.

A. A typo.

Q. Okay. And this is from whom?

A. This is from IMC, the holder of the leases in Sections 15 and 22.

Q. And who authored the letter?

A. John Purcell, chief mine engineer.

Q. And who did he copy on that?

A. He copied the BLM, the OCD, and Dan Morehouse.

Q. And if you look at the second paragraph, at the second sentence, would you see what IMC's chief mining engineer stated?

A. They stated that, "The west half of Section 16 has several wells on it, and while another hole adds additional risk, locating the well in the west half of Section 16 minimizes the effects on potash."

Q. So IMC's chief mining engineer is indicating that the best location for a deep gas well is in the west half of Section 16.

A. That's correct.

Q. And he made that declaration to not only Fasken,

but also to the BLM, and to the Oil Conservation Division, according to this letter.

A. Yes.

MR. MANGES: Objection, your Honor, hearsay.

MR. BROOKS: I believe that's hearsay as far as it's offered to prove that that is, in fact, the best location from a mining point of view, so I'll sustain that objection.

MR. FELDEWERT: Mr. Examiner, one exception to the hearsay rule is a business record. I think we've established that it's a business record, so I do intend to introduce the exhibit into evidence.

The weight of the evidence, of course, is subject to your determination.

MR. BROOKS: I'm going to stick with my ruling because I think the purpose of business records exception is to establish -- the purpose of the business records exception is to allow matters that are noted, that are routinely the subject of business records to be proved by business records.

And I believe when you have a separate hearsay within a business record that you have a situation of hearsay within a hearsay where it's necessity to establish an exception for each level of hearsay. And it seems to me this falls within that principle. So I will stick to my ruling and sustain the objection as hearsay to the extent that that statement in Mr. Purcell's letter is offered for proof of what is, in fact,

the best mining location.

I certainly have no problem with it being admitted for the purpose of proving that Mr. Purcell said that. Okay?

Q. (By Mr. Feldewert): Okay. Ms. Kvasnicka, in your opinion as a landman, does Fasken's proposed well in the northwest quarter at your proposed location minimize the effects on potash yet allow Fasken to recover oil and gas reserves underlying Section 16?

A. Yes.

MR. MANGES: Objection, your Honor. The witness is not qualified to give an opinion about minimization of wasted potash. She's a landman, not a potash mining witness.

MR. BROOKS: Well, I wasn't anticipating the objection so I wasn't listening real carefully to exactly how you phrased the question. Would you restate the question, please, Mr. Feldewert?

Q. (By Mr. Feldewert): As a landman, based on the records that you have reviewed, does Fasken's proposed well -- based on the records that you have reviewed -- and we've gone through them today -- minimize the effects on potash and allow Fasken to recover oil and gas reserves underlying Section 16?

MR. MANGES: Same objection.

MR. BROOKS: Okay. I'm going to overrule the objection because I believe that we're talking about matters -- merely the location, not anything having to do -- that would

require technical expertise other than land, so I'll overrule the objection.

THE WITNESS: And my answer is yes.

Q. (By Mr. Feldewert): Based on the records that you have reviewed, will the approval of this application in it's proposed location be in the best interests of the State?

A. Yes, it will.

Q. And why is that?

A. Well, it will afford the State additional royalties that it might not ever receive if we're denied the ability to drill a gas well.

Q. Okay. And is there a potash lease in this section?

A. No, there's not.

Q. Have we seen any indication from Intrepid that they have filed any mining plan with any federal or state agency?

A. No, we have not.

Q. For Section 16?

A. For Section 16.

Q. And is this well located more than a half a mile from the idle north mine based on the map they presented to you?

A. Yes, it is.

Q. And will this location, this unorthodox well

location, allow the recovery of oil and gas reserves yet have a minimal effect on the idle north mine in the radius from this well?

MR. MANGES: Objection, your Honor. You know, again, this witness isn't qualified to testify about the effect this well will have on the idle north mine. She has absolutely no expertise about potash.

MR. BROOKS: Okay. I am understanding this is not a technical opinion. I'll overrule the objection.

Q. (By Mr. Feldewert): Now, with respect to the notice of this application, is the working interest common throughout Section 16?

A. Yes. We have a JOA that covers all of Section 16.

Q. Now, was notice of this hearing and application provided to the State Land Office and the potash lessees within one mile of the proposed well site?

A. Yes.

Q. And is Fasken Exhibit 12 an affidavit indicating notice of the hearing was provided to the State Land Office, the Mosaic Potash Company, and the Intrepid Companies?

A. Yes, it is.

MR. MANGES: I need to object to the form. I think what the question asked was notice of the hearing, and I think the exhibit is actually notice of the application, not this

particular hearing.

MR. FELDEWERT: It was an application for hearing.

MR. MANGES: Same objection.

MR. BROOKS: Overruled.

Q. (By Mr. Feldewert): Ms. Kvasnicka, is Exhibit 13 publication of the application and the hearing?

A. Yes, it is.

Q. And it was put in the Lovington Leader?

A. It was published in the Lovington Leader.

Q. Were Fasken's Exhibits 1 through 13 prepared or obtained or complied under your direction or supervision?

A. Yes.

MR. FELDEWERT: Mr. Examiner, I move the admission into evidence of Fasken's Exhibit 1 through 13.

MR. BROOKS: 1 through what?

MR. FELDEWERT: 13.

MR. BROOKS: 13. Okay. Which ones of those were your confidential -- were produced under the confidentiality order?

MR. MANGES: I've got the mine plans which are Exhibit 9 and 10 which would be confidential exhibits that need to be kept separate.

I would also like to lodge an objection to Exhibit 11 on the grounds of hearsay. I think the Examiner already ruled on this, but I think we need to make it clear that if you're

going to allow the exhibit to be entered, that the hearsay within the hearsay and double hearsay within the exhibit is not admissible.

MR. BROOKS: Well, I've already ruled on that as to the double hearsay. It doesn't render the document itself inadmissible. Because as Mr. Feldewert pointed out, it's a business record, so it's admissible for whatever purposes it serves as a business record.

MR. MANGES: Let me just -- I just have one other objection. The transcript that we talked about -- and this is Exhibit 4 -- we object to the transcript and the testimony therein on the due process hearsay grounds that I explained earlier.

MR. BROOKS: Okay. Does either attorney have a copy of the statute from the Energy, Minerals and Natural Resources constituent statute that I cited to you the other day by e-mail? I didn't bring one down with me.

MR. FELDEWERT: It's got my secret notes on it, but if you ignore my secret notes, I guess I can give it to you.

MR. BROOKS: Okay. I'd like to review the text for purposes of making a ruling.

MR. FELDEWERT: Would it be a good time for a quick break?

MR. BROOKS: That would be acceptable. Let's take a break at 10:21. We'll take 10 minutes.

[Recess taken from 10:22 a.m. to 10:33 a.m., and testimony continued as follows:]

MR. BROOKS: Okay. We'll go back on the record at 10:33. And based on the Section 71-2-8, I will hold that the records that were produced as confidential records will be admitted in evidence, but as sealed records. A party or a non-party may move to unseal them, and the matter can be addressed on the merits at that time.

I don't think we could preclude another party from doing so in any case because we could always have a public information request. And at that time, the Division would assert to confidentiality, but it would be up to whoever the decision-maker was to determine whether the confidentiality applied.

Which exhibits was it? Was it 10 and 11 that were confidential -- that were produced as confidential?

MR. MANGES: 9 and 10.

MR. BROOKS: Okay. Exhibits 9 and 10 will be admitted under seal. Exhibits 1 through 7 -- wait a minute. I'm sorry. Exhibits 1 through 3 and 5 through 7 and 10 through 12 will be admitted generally. Exhibit 4 was the transcript, and that was not admitted.

MR. FELDEWERT: I think -- Joe?

MR. MANGES: Yes?

MR. FELDEWERT: I believe what you were wanting

admitted under seal was 9 and 10.

MR. MANGES: That's correct.

MR. FELDEWERT: So I think, Mr. Examiner, it's 5 through 8, and then 9 and 10 under seal.

MR. BROOKS: Okay, 9 and 10 are admitted under seal, correct? That's what you said. 1 through 3, 5 through 8, and 11 and 12 are admitted as public exhibits. And 4 is not admitted.

[Applicant's Exhibits 1 through 3, 5 through 8, 11 and 12 admitted into evidence.]

[Applicant's Exhibits 9 and 10 admitted into evidence under seal.]

MR. FELDEWERT: So the transcript is not being admitted?

MR. BROOKS: That's correct. And do you pass the witness, Mr. Feldewert?

MR. FELDEWERT: Yes, I do.

MR. BROOKS: Okay. At 10:35. You may proceed with cross-examination, Mr. Manges.

CROSS-EXAMINATION

BY MR. MANGES:

Q. Good morning, Ms. Kvasnicka.

A. Kvasnicka.

Q. Kvasnicka. Thank you. Let's talk briefly about Fasken's lease here. It's my understanding that that was

extended by the State Land Office.

A. Yes, it was. We obtained a five-year extension because of the denial of our APD last spring.

Q. Okay. And that denial was based on Intrepid's objection?

A. Yes.

Q. So when does the lease expire now?

A. Well, it expires five years from October 1st, 2008.

Q. So 2012?

A. Yes.

Q. So there's no imminency here in terms of expiration of the lease, right?

A. No. Only our loss of value of not being able to drill a well and produce reserves for ourselves and pay royalties to the State.

Q. The other thing you testified about on direct examination was that you moved the location of the proposed Fasken No. 2. It looks like you moved it 205 feet to the south and 425 feet to the west; is that right?

A. Yes.

Q. Now, did you notice any potash operators of the amended location?

A. I know that we provided it to Intrepid through Mike Feldewert.

Q. I'd like you to take a look at your Exhibit No. 1. Do you have that before you?

A. I do.

Q. Now, it appears from Exhibit 1 that you indicate Mosaic was the leaseholder in Section 15; do you see that?

A. I do.

Q. And wouldn't it be true that your amended location is actually closer to Mosaic's leasehold?

A. By a few feet, but it's still in the west half of Section 16.

Q. Well, by a few feet. Didn't you move it 425 feet to the west?

A. Yes.

Q. Is that what you consider to be a few feet?

A. Yes.

MR. BROOKS: I thought you moved it to the east.

MR. MANGES: I mean to the east, pardon me.

THE WITNESS: We moved it to the east.

Q. (By Mr. Manges): In any event, you didn't provide notice to Mosaic of the new location?

A. The new location was provided to Intrepid as a matter of trying to get an approved location for drilling the well. We'll be glad to notice Mosaic of our new location.

Q. Okay. What I'm asking: I am asking whether you have already or not?

A. No, we have not.

Q. Now, the primary goal is the Morrow Sands; is that right?

A. Well, I'm not a geologist, but our well that's producing in the southeast/southeast of Section 16 is producing from the Morrow and the Strawn.

Q. Okay. Why don't you take a look at your Exhibit 8. And you testified on direct that one of the reasons you moved the proposed location was to be more than a half a mile away from Intrepid's mine. Do you recall that testimony?

A. Yes. Your idle mine in Section 9.

Q. And what you are referring to is the southern most section of Section 9; isn't that right?

A. Well, yes.

Q. Okay. Now, the original location overlapped the southern portion of the section -- the idle mine in Section 9; isn't that right?

A. Yes. By maybe -- I have not measured it, but it overlaps by just a few feet.

Q. And your new location is intended to not overlap the mine; is that right?

A. That's correct.

Q. Was that -- did you do that in accordance with R-111-P rules? Was that your goal?

A. Yes.

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Q. Now, you understand that R-111-P also has a buffer area around an LMR, don't you?

A. Right. And I understand that rule of thumb to be half a mile for deep gas wells and a quarter mile for shallow wells.

Q. You would admit that the proposed location is within one half mile of the southern section of Section 9, isn't it?

A. It is within the half mile of Section 9, but it's outside of the boundaries of the idle mine.

Q. Okay. I'd like you to assume that Intrepid's LMR is along the southern boundaries of Section 9 and the eastern boundary of Section 17. Based on that assumption, it would be true, isn't it, that this proposed location is within one half mile of Intrepid's LMR?

A. Slightly, yes.

Q. And that would be one half mile of the southern boundary of Section 9 and one half mile of the eastern boundary of Section 17; isn't that correct?

A. Yes.

Q. Now, you keep referring to the one half-mile buffer as a rule of thumb.

A. Yes.

Q. Are you aware of the scientific basis for the one half-mile buffer?

A. I'm not qualified to speak on the scientific basis.

Q. You're not aware of the scientific basis?

A. No. I'm not qualified.

Q. And you're not aware of whether there is a scientific basis for the one half-mile buffer?

A. You speak of it, so I assume there is, but I'm not aware of it.

Q. Okay. Well, I asked whether you were aware whether there was a scientific basis for a one half-mile buffer.

MR. FELDEWERT: Objection. Asked and answered.

MR. BROOKS: Sustained.

Q. (By Mr. Manges): Let's turn to your Exhibit 5, and, I believe, the first page, your testimony was that the one half-mile -- pardon me -- the one quarter mile so-called buffers around the various old oil and gas wells cover the entire section, right?

A. Yes.

Q. Now, is it Fasken's position here that oil and gas drilling should proceed initially and then potash should be allowed to come in afterwards and create this win/win situation?

A. Yes, it is.

Q. All right. So isn't that position inconsistent

with your Exhibit No. 5 here which shows all of these circles around which there are buffers that potash companies can't mine?

A. Can you ask that question again, please?

Q. Sure. Isn't that position, this win/win position that oil and gas should come first and then potash later, isn't that inconsistent with your Exhibit 5 here which shows all these buffers that preclude or would preclude mining potash?

A. No. I do not think that it is inconsistent.

Q. Well, aren't you arguing that Section 16 cannot be mined because of all these buffers?

A. Yes.

Q. Okay. And then how can you take the very same position that once the Fasken well is drilled, somehow potash mining companies will be able to come in and mine?

A. Because I -- from things that you have -- Intrepid has presented you're going to assert later that you might be able to mine closer. But as R-111-P states, a safety buffer of a shallow well is a quarter mile, and a deep gas well is a half a mile. And that was the purpose of this exhibit.

Q. And that's based on the rule of thumb?

A. Yes.

Q. And you're not aware of any scientific basis for that rule of thumb?

MR. FELDEWERT: Asked and answered.

MR. BROOKS: Sustained.

Q. (By Mr. Manges): Look at the order -- and we'll turn to Exhibit No. 3 -- pardon me -- No. 3, Page 2, Paragraph 9C.

A. Yes.

Q. And that says the closest potash mine is approximately two miles to the northwest of Fasken's proposed well location. Do you see that?

A. Yes.

Q. Well, that finding is clearly wrong, isn't it?

A. Well, this is not something that I stated. This is an order from the Commission. And I'm not sure where they got this estimate of approximately two miles.

Q. In fact, it's about one mile, isn't it?

A. It's about one mile -- the idle mine is in Section 9, approximately one mile.

Q. And Fasken No. 1?

A. From our location in the southeast/southeast of Section 16.

Q. Now, you keep referring -- now, you referred to Mississippi Potash as Intrepid's predecessor; do you recall that?

A. Yes.

Q. If fact, are you aware that Intrepid bought Mississippi Potash's assets out of the bankruptcy?

A. Yes.

Q. All right. And are you aware of any legal connection whatsoever between Intrepid and Mississippi Potash?

A. No.

Q. Now, are you aware whether -- are you aware that Intrepid has, in fact, made a lease application for potash for Section 16?

A. I have heard that through what you said earlier in you're pre-hearing statement, but only as of that period.

Q. Have you had any conversations with anybody at the State Land Office regarding that matter?

A. Not a potash lease in Section 16, no.

MR. MANGES: We'll pass the witness, your Honor.

MR. BROOKS: Pass the witness? Okay. I'm sorry. We're not through.

THE WITNESS: I'm sorry.

MR. BROOKS: The examiners might need to ask you some questions here. I just have a couple and we'll see if Mr. Warnell does.

EXAMINATION

BY MR. BROOKS:

Q. This Exhibit 5 is the location plotted on this that the red circle is plotted from, is that the original location or is that the amended location?

A. I believe that's the amended location.

Q. Now, Exhibit 8, I understand that the checkered circle is a half-mile radius around the original location and the red circle is a half-mile radius around the original location; is that accurate?

A. The red circle is around the amended location, yes.

Q. Yeah. And the striated circle is around the original location?

A. That's correct.

Q. Okay. Now, is the oil and gas ownership, the ownership of the oil and gas working interest uniform throughout Section 16?

A. Yes, it is.

Q. And as to all depths?

A. All depths.

Q. Okay. Now, what were the cause for the amended location?

A. The amended location is 2,135, I believe. I'm trying to find my paperwork so I can tell you exactly. Because I don't want to give it to you off -- 2,135 from north line and 2,455 from the west line.

Q. So it would encroach only internally within Section 16. It wouldn't encroach on any other section?

A. That's correct.

Q. That's what I thought.

A. And we had to also, to not only avoid the shallow wells in finding a new location for our well, but there are pipeline right-of-ways that cross which we had to avoid.

MR. BROOKS: Right. That's all I have. Mr. Warnell?

EXAMINATION

BY MR. WARNELL:

Q. Question on the wells that are drilled out there. Are they all vertical wells?

A. I understand that they are. They were all primarily drilled in the '50s. All the shallow wells were drilled in the '40s and '50s.

Q. So to your knowledge, there are no laterals or horizontal wells in Section 16?

A. That's correct.

MR. WARNELL: Okay. Thank you. No more questions.

MR. BROOKS: Mr. Feldewert? Redirect?

REDIRECT EXAMINATION

BY MR. FELDEWERT:

Q. Yeah. I just have one clarification. And perhaps I can do it this way. Ms. Kvasnicka, would you look at what's been marked at Exhibit 32 in that black binder. It should be the last exhibit.

A. Yes.

Q. That is Intrepid's amended pre-hearing statement that was filed in this case, correct?

A. Yes, it is.

Q. And attached to that is their Exhibit A that has the blue hatch circle.

A. Yes, it is.

Q. Okay. And am I correct that for Intrepid's Exhibit 8, this large blowup, that you retained their blue hatched circle --

A. That's correct.

Q. -- from the original location. And then added your new location and added the red circle?

A. Yes.

Q. So the only thing that you changed with respect to their map that they provided with their pre-hearing statement is added a red dot, the new location and added a red circle.

A. That's correct.

MR. FELDEWERT: Okay. That's all I have.

MR. BROOKS: Very good. Well, let me clarify. Did you have anything further for the witness, Mr. Manges?

MR. MANGES: We don't.

MR. BROOKS: I want to clarify that -- so the witness may stand down.

I wanted to advise people of the procedure. Because it's customary in the OCD for the Examiners to ask questions of the witness. I would -- the order of procedure will be:

Direct, cross, questions from the Examiner, and then redirect. And then I will give the opposing party the opportunity to recross, but recross is limited to matters raised in the examination by the Examiner. Because normally we don't allow recross, but since you have not had a chance to respond to things raised by the Examiners in your first cross, we do allow recross for that purpose.

You may stand down. You may call your next witness.

MR. FELDEWERT: Mr. Examiner, we will call John Worrall.

MR. BROOKS: Any relation to the technical examiner?

THE WITNESS: No.

JOHN WORRALL

after having been first duly sworn under oath,

was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. FELDEWERT:

Q. And I apologize. With the last name of Feldewert, I should be more sensitive. I think I butchered your last name. Could you please state your name for the record.

A. John Worrall.

Q. Worrall. And are you employed by Fasken?

A. No.

Q. Okay. What is your involvement in the project?

A. I was the geologist that originated the prospect. And, I brought it to Fasken and I'm currently a working interest owner in the project.

MR. BROOKS: I'm sorry. I didn't hear the last answer.

THE WITNESS: I'm a working interest owner in the project.

MR. BROOKS: You're a working interest owner, okay.

Q. (By Mr. Feldewert): You're the one that brought this project to Fasken?

A. Yes.

Q. Was that both the Laguna No. 1 and now the Laguna No. 2?

A. Yes. That was the required leases for them.

Q. Have you previously testified before this Division?

A. Yes, I have.

Q. Did you testify at the 2003 hearing involving the Laguna No. 1?

A. Yes.

Q. At the time of that testimony, were your credentials as an expert in petroleum geology accepted and made a matter of record?

A. Yes.

Q. Are you familiar with the application in this

case?

A. Yes.

Q. Have you conducted a geologic study of the area that is the subject of this application?

A. Yes, I have.

MR. FELDEWERT: We tender Mr. Worrall as an expert.

MR. BROOKS: Any objection?

MR. MANGES: No objection.

MR. BROOKS: So qualified.

Q. (By Mr. Feldewert): All right. Was the primary target of Fasken's proposed well in Unit F of Section 16 which is in the northwest quarter?

A. The Strawn and Morrow formations.

Q. How deep do you plan to drill?

A. 13,400 feet.

Q. Was the Laguna No. 1 in the southeast quarter of the southeast quarter of Section 16 a successful well in the Morrow Sands?

A. Yes, sir.

Q. Was it a wildcat well?

A. Yes, when we drilled it.

Q. Was it also completed -- is that Laguna No. 1 also completed in the Strawn Formation?

A. Yes, it is.

Q. So you have a dual completion?

A. We do.

Q. Is there a potential for a Morrow or Strawn gas well in a northwest quarter of Section 16 at the proposed location?

A. Yes.

Q. Will Fasken's existing well in the southeast quarter the southeast quarter of Section 16 be able to recover these reserves that you project in the northwest quarter?

A. No.

Q. Will a vertical well at the proposed location in the northwest quarter provide an opportunity to encounter other potentially productive zones outside of the Strawn and the Morrow?

A. Yes. There's several different reservoirs above the Strawn. The Strawn doesn't start until 12,000 feet.

Q. And what formations are they?

A. The Bone Spring and the Delaware. There is also Wolfcamp.

Q. Okay. Do you have -- have you prepared exhibits demonstrating why this proposed location was chosen?

A. Yes, I have.

Q. And do these exhibits also demonstrate the risk associated with this endeavor?

A. Yes, it does.

Q. And do those exhibits also demonstrate the

potential for oil and gas production in formations other than the Morrow and the Strawn?

A. Yes. We have an exhibit that will speak to that.

Q. Okay. Then I believe your first exhibit is Fasken Exhibit 14.

A. Yes, sir.

Q. Why don't you first identify that, orient the Examiner, and review it with him, please.

A. Okay. Exhibit 14 is a net porosity isopach of our Morrow pay zone. And there's several things on here I'd like to point out. First, I'd like to point out the red line on here is going to go from three different wells, the southern well, of course, being our Laguna 16 State No. 1.

And then I'll show you two wells to the north. They are the closest deep wells. And I would point out on this map this is only wells deeper than 11,000 feet. So I've taken all the shallow wells off this map for clarification. I also note on here with the red arrow the proposed location for the Laguna 16 No. 2. So you can see where that is northwest of No. 1.

The map itself is a porosity isopach of the Morrow Sand, and it's showing feet of sand greater than 6 percent. And underneath each well you'll see the number of feet. For instance, the Laguna 16 has 16 feet of pay in the Morrow. You go to the northwest and the George 1 and George 2 wells -- and

the well names are shown -- have 37 and 50 feet of porosity in those two wells.

Q. Do you project additional sands at the proposed location?

A. Just based on the map, it would suggest 25 feet. And the cross section I'll show you in the section will show you that the two wells in 5 have four different sands totalling 37 and 50 feet. Our well has 60 feet. So just going in between those we hope to encounter additional sands and hopefully more than the amount of sand we encountered in the first well.

Q. Okay. Anything else of importance in this map?

A. That's about it.

Q. Okay. Why don't we turn to what's been marked as Fasken Exhibit No. 15 and explain that to the Examiner.

A. Exhibit 15 is just a log cross section. And for each of the three wells shown -- the three wells, by the way, are the Laguna well on the right and then the two wells in Section 5 are the other two wells on the left side -- and shown is a porosity log and a resistivity log for each of those wells.

Shown in yellow are the sands in the middle Morrow. And shown in red are where the wells are perforated. And if you look down the middle line, you'll see a notation where the wells are perforated and where it's completed from. And the

key thing for this map would be our Laguna well has one sand that's productive. The two wells to the north, the George wells, have four different sands.

And if you'll notice, this is hung on the top of the Middle Morrow. Stratographically these four are different than that one. And so there is a stratographic component to these reservoirs. They come and go is the main point. We're hoping to get closer to the wells and have more sands and reserves.

Q. Will the existing well in the southwest quarter then be able to drain the Morrow sand reserves that you project at the proposed location?

A. No.

Q. Okay. Anything else on this map?

A. That's about it.

Q. Okay. Why don't we turn to what's been marked as Fasken Exhibit 16.

A. Okay. This is a structural cross section of the same three wells. Instead of hanging on a stratographic marker, this is hung relative to sea level. And it shows in color the top of the Strawn Formation, the top of the Atoka Formation in green, orange is Morrow, and then the red is the Middle Morrow. And then again, you see the Middle Morrow Sands.

Structurally note that our well is down dip structurally of the two wells in Section 5 by several hundred

feet. And then also note up in -- if you look between the blue and the green tops, and you go over to the Laguna 16, you'll see a thin zone. It's about eight feet thick. That's where we're perforated in the Strawn. So I just wanted to identify the Strawn pay zone with this exhibit.

Q. Does this exhibit show any other zone, producing zones, in the Strawn for the other two wells?

A. No. They are down dip of some other producers and I'll show you on the next exhibit.

Q. Okay. Your proposed well, through, is going to be structurally higher in the Strawn?

A. The proposed will be 140 feet high to the initial well.

Q. Okay. All right. Anything else on this exhibit?

A. No, sir.

Q. Let's turn to Fasken Exhibit No. 17.

A. Exhibit 17 is a structure map on top of the Strawn Formation, that blue line that we had looked at on the last map. The Strawn is a limestone by lithology. And in green, are all the different wells that produce from the Strawn Formation. If you'll notice to the north, there's a field called the Lusk Field in which there were some prolific reserves. All of those wells in green, generally four per section, produce from the Strawn reservoir. And then shown in the numbers underneath it are the numbers of barrels of oil and

the numbers of MCF gas that is produced from the Strawn.

Our well, the initial well, the Laguna 16 encountered the top of the Strawn at minus 8,269 feet below sea level. And our proposed location would be about 140 feet high to that, based on the structural information that we have. You are going up dip to the wells in Section 5. They're about 400 feet higher. So we're moving up the slope as we drill from the Strawn to the Morrow Formation.

Q. Do the reserves appear to be better as you move to the north of the slope?

A. Yes. This bubble map is for wells that are 300,000 barrels or higher. They max out at the circles that are shown. Yes. Our well to the southeast through '07 has made 29,000 barrels so far from the Strawn. It is currently producing 40 barrels a day.

Q. Do you expect to encounter new Strawn reserves in the northwest quarter of Section 16?

A. We hope to.

Q. And will the existing well in the southeast quarter of the southeast quarter of Section 16 be able to recover the Strawn reserves in the northwest quarter of 16?

A. No, sir. These are based on 160-acre spacing, historically.

Q. Anything else on this map?

A. No, sir.

Q. Okay. Why don't you then turn to Fasken Exhibit 18.

A. Fasken Exhibit 18 really speaks to the other horizons that are above the Strawn and the Morrow. And colors on this -- let me explain that. Of course, Section 16 is in the middle. You'll notice a purple color. Those are the wells that is a bubble map of production from the Yates Formation, which is about 2,500 to 2,700 feet. The red colors are Delaware wells. The Delaware is 3,500 feet, and I'll speak to that in a second. The blue wells are Bone Spring wells that are deeper than the Delaware.

So all of these different wells that produce from those shallow horizons are shown by the three different colors. And also this is a structure map at the base of the Delaware or top of the Bone Spring, just generally showing that structurally you can climb up to the north and you dip to the south.

I'd like to point out that the different horizons or different formations are a little misleading. You might think the Delaware is one formation. It's actually 3,500 feet thick. The Bone Spring is 3,000 feet thick. And you get multiple layers within that, just like you have multiple salt layers within the salt. For instance, the Morrow well drilled in Section 14 encountered a Delaware pay zone at 5,000 feet and it's made 500,000 barrels. It was the reason they drilled the

well, but they found it by drilling the deep well.

To the southeast, in the very southeast corner, that's the Hat Mesa Delaware Field. There the Delaware is at 7,300 feet, a deeper stratographic interval within the Delaware. So the northwest Lusk Field produces from around 7,100 feet, a different horizon still. So my point is that you get multiple different stratographic intervals within the Delaware and Bone Spring that you can find when you intersect with a well bore.

Q. Are they independent producing zones?

A. Yes. Outside of an existing field, there are different horizons within the formation.

Q. Okay. And do you, based on this map, project these to be secondary up-hole opportunities in the event that the vertical well is unsuccessful in the Strawn and the Morrow?

A. Yes. When you drill your well, you always mud log, and log these intervals to look for opportunities up the hole.

Q. Okay. Anything else on this map?

A. No, sir.

Q. Now, we've looked at your maps here and your projections. In your opinion, as an expert in petroleum geology, is there a reasonable probability of finding oil and gas reserves in the Morrow or the Strawn Sands in commercial quantities at the proposed location?

A. Yes.

Q. And these are reserves that will not be recovered from the existing well in Section 16?

A. That's correct.

Q. What do you project to be your chances of success in completing in either the Morrow or the Strawn?

A. I would give each zone a 50/50 success. It's just a matter of how much of the reservoir you contact.

Q. Okay. With this 50/50 shot here, will a vertical well increase the chance of success of finding recoverable reserves?

A. Would you state the question again?

Q. Given a 50/50 chance of success in the Morrow or the Strawn, will a vertical well provide an opportunity to find other recoverable reserves?

A. Yes. We drilled the Laguna 16 State No. 1 and did not see any shallower zones in that well. By moving a half mile northwest we hope to encounter other secondary zones as well as primary zones.

Q. And what would those secondary zones be?

A. I'd love to find a Delaware zone like the well two miles away. The Delaware and Bone Spring and Wolfcamp.

Q. Okay. Are you aware of the cost of drilling a directional well from the Laguna No. 1 pad to the Morrow Sands in the northwest quarter?

A. Yes.

Q. What is the difference in cost?

A. The difference -- a vertical well Fasken estimates currently a $4.4 million drilling complete cost, and a directional well at $5.9 million cost.

Q. Now, are you a working interest owner in this project?

A. Yes.

Q. You're the one that brought this to Fasken?

A. Yes.

Q. Would you recommend pursuing this project in the northwest quarter with a directional well?

A. No.

Q. Why is that?

A. Well, there's several reasons. Cost is one. Risk associated with drilling a slant hole, mechanical risks, is the second. And the third is we would not get an opportunity to look at the shallower formations with a slat hole. It would be too close to a well we've already drilled.

Q. In your opinion, will approval of a vertical well at the proposed location provide an opportunity to recover commercial quantities of oil and gas underlying the northwest quarter of the State lands that will otherwise not be recovered?

A. Yes.

Q. All right. Did you conduct a review of the history of this field?

A. I did.

Q. All right. Did you prepare exhibits?

A. I have.

Q. Let's take a look at Fasken Exhibit 19. Would you explain that to the Examiner, please?

A. Fasken Exhibit 19 is simply a well map. And again, here's our Laguna 16 No. 1. It's produced 70,000 barrels and 786 million cubic feet of gas so far. It currently produces 29 million a month and 60 barrels a day, 1,800 barrels of oil production.

It also shows our proposed location. And last thing I wanted to point out -- I'm going to show you on the next exhibit the initial well drilled. This is called a halfway field, and we're going to go through the history of the halfway field. The initial well drilled is the well in the very far northeast/northeast. It says State No. 1. I'm going to show you a sample log from that well next.

Q. What was the general era in which this field was drilled?

A. The State No. 1 was drilled in 1931. And the discovery well for this field was 1939. And then the last well drilled, of course, is 2003. But most of the wells I'll show you in a minute were produced between 1940 and 1957.

Q. And then when were most of these wells plugged and abandoned?

A. Most of them were plugged between 1940 and 1957. The last well that produced was in 1987.

Q. Okay. Anything else on this map?

A. No, sir.

Q. Let's turn to Fasken Exhibit No. 20. What did you do there?

A. Well, I was just trying to determine where is the salt layers that we're talking about. This is a sample log from that well in the northeast/northeast of Section 16. It's a sample log I acquired at the Permian Basin sample library and was placed in the Roswell Energy library. What it shows, if you can read the depths on the right side, there are different formations by color. It starts on the left side and goes to the right.

Q. Start on the left and it moves down as I go to the right?

A. Yes. It starts here from zero feet and it goes down to 1,000, 1,000 to 2, and 2 to 3, basically.

Q. Okay.

A. And the colors in pink are the salt layers. And this is just a general estimate of salt. The guys that did this were just looking to know it was a salt of some kind, right? And the top of salt in this particular well is at 925

feet.

Q. Where do you show that?

A. I note it myself, the top salt.

Q. On the left side?

A. On the left side. Following down the middle layer, middle line, the base of salt at 2,320 feet.

Q. And you show that in the column on the right-hand side?

A. Yes. I note base of salt and underneath that you'll see something I noted called the pay interval for the halfway field. It's at depths of 2,500 to 2,700 feet. So it's below the deepest salt in that well.

Q. But it's just below the salt?

A. It's 200 feet below.

Q. So the producing zone for these older wells was just below the salt layer?

A. Yes. And that is, again, on the top of salt and base of salt. That's just a gross interval.

Q. Okay. Anything else on this map?

A. No, sir.

Q. Okay. Let's turn to Fasken Exhibit No. 21. What are you showing here?

A. Exhibit 21 is a spreadsheet, an Excel spreadsheet just showing you the location. I'll go through this. It's three pages, and it lists wells 1 through 20 in sequential

order, noticing that the first well, again, is that Western Drilling well that we just looked at the sample log on.

Q. That's your 1931 well?

A. That's the well drilled in 1931.

Q. And at the end of this it shows the Laguna No. 1.

A. And then the Laguna 16 No. 2 proposed, which would be the 20th well drilled in this section.

Q. Okay. So this is chronological order?

A. Chronological order.

Q. Okay.

A. The various things I show on this is the operator, the well name, location, the year it was drilled, total depth -- notice on total depth all but two of these wells were drilled are considered shallow wells by R-111-P, below 5,000 feet -- two are deeper.

Q. Let me stop you right there. You had two -- you show two deep wells on this map?

A. Yes.

Q. Okay. What are they?

A. Numbers 18 and 19. No. 18 was drilled by Nearburg. That's the Maverick 16 State No. 1, 2,300 from south, 2,310 from east. It was drilled to a depth of 5,380 feet.

Q. And where is that? Where is that located on the map?

A. If you go back to the exhibit here, it's 10 feet away from another well, so the letters kind of overlap, but in the northwest of the southeast.

Q. Let me stop you right here. You're looking at Exhibit 19?

A. Yes.

Q. And where is that deep gas well drilled by Nearburg located, roughly?

A. There's three locations all within 100 feet, but it's 2,300 from south, 2,310 from east.

Q. So almost right in the middle of the section?

A. Yes, sir.

Q. Okay.

A. The key thing we wanted to look at with this chart -- I'm sorry --

Q. Go ahead.

A. -- was the casing. You know, how were these wells plugged and what kind of casing do we have on these wells?

Q. Before you get there, where did you get the information?

A. All this information comes from the NMOCD website. It's public information.

Q. Okay.

A. And it shows the casing, surface, immediate, and

production that was set in these wells.

Q. All right. Which one do you want to focus on?

A. Well, I'll just use No. 3 as an example. That well was set 420 feet. This was drilled in 1939. And if you'll notice, the first 10 wells are all drilled from 1939 to 1941. So there was quite a bit of wells drilled during World War II that are similar to this well.

After the setting, what they would do is they would land their surface casing. Then once they got the intermediate casing, they would pull that surface out. In other words, they wouldn't cement it. In this case, they had 450 feet of surface, 883 feet of intermediate, and 2,606 feet of production.

The well was plugged in 1940 and they pulled 2,387 feet of production casing out of the well leaving about a little over 200 feet. They pulled 475 feet of intermediate leaving 300 to 400 feet and they pulled all the surface casing. Point being, there is no casing over the salt section in this well.

And just to make it simple, where there's a pipe gap or no casing over the salt, I just colored them in bold on the bottom. And you'll see that there's eight wells that have pipe gaps or no pipe on the salt section out of the 18 that were drilled.

Q. Can we tell from Division records what kind of

cement is in these?

A. I did not attempt to study the cement, but typically they would tack in the bottle and tack in the bottom -- at that time, they were not required to circulate cement.

Q. Okay. So you have roughly what, nine of these 20 wells have either gaps or no pipe through the salt?

A. Well, there's 18 shallow wells and eight of the 18 have gaps.

Q. All right. Okay. So these wells that were plugged in the 1950s, at that time, we did not have R-111-P, correct?

A. It was 1988, that's correct. It still was no longer productive when R-111-P was put in place.

Q. So they didn't mean to at that time and did not have the string, the cementing, and the other requirements in R-111-P for plugging wells?

MR. MANGES: I'll object to that. I think this witness is making an assumption about something that happened 40 years ago, and I don't see any evidentiary background or foundation for this assumption.

MR. FELDEWERT: He said he looked at the record.

MR. BROOKS: I'll overrule the objection. Go ahead.

Q. (By Mr. Feldewert): Okay. Anything else about this map -- I'm sorry -- about this chart?

A. From this chart, the next exhibit will be color coded.

Q. All right. So let's take a look at the next exhibit. What did you do here?

A. This is a map, a radius map, similar to the one that Ms. Kvasnicka presented earlier showing the quarter mile boundaries and the half-mile boundaries around the deep gas well. The only difference is for the eight wells where there was a pipe gap, I just colored it differently. I colored it brown.

And then the green ones are where I didn't notice a pipe gap. And then the big red one is the half-mile radius around the Laguna 16 State No. 1. And the purpose of this was simply to show that our well is in the middle of a series of wells colored brown where there is pipe gaps or no pipe over the salt sand.

Q. Okay. And you used the quarter mile rule of thumb under R-111-P?

A. Yes, I did. The last thing I would show is there's a red half-mile circle around the radius of the Laguna 16 State No. 2.

Q. Your proposed well?

A. Yes.

Q. And it's a dotted --

A. It's a dashed red line.

Q. Okay. All right. In your opinion, as a geologist, is it in the best interest of conservation and the prevention of waste to allow continued oil and gas development in this unique Section 16?

A. Yes.

Q. Were Fasken Exhibits 14 through -- Fasken Exhibits 13 through 22 prepared by you or compiled under your direct supervision?

A. Yes.

MR. FELDEWERT: I would move into evidence the admission of Fasken Exhibits 14 through 22.

MR. BROOKS: Any objection?

MR. MANGES: No objection here.

MR. BROOKS: Exhibits 14 through 22 are admitted.

[Applicant's Exhibits 14 through 22 admitted into evidence.]

MR. FELDEWERT: And, Mr. Examiner, before I finish here, and before I forget about it, did we -- we admitted into evidence Exhibits 12 and 13 as well already, correct?

MR. BROOKS: I don't believe 13 -- I'm not sure if 13 was admitted.

MR. FELDEWERT: I got a little confused. That was the affidavit of publication. I'm assuming that was admitted.

MR. BROOKS: I believe 13 was not admitted, but I don't believe there was any reason why it was not admitted.

There was no objection to 13, correct?

MR. MANGES: No, there's no objection.

MR. BROOKS: Okay. If it was not admitted before, 13 is admitted.

[Applicant's Exhibit 13 admitted into evidence.]

MR. FELDEWERT: Okay. That concludes my examination of this witness.

MR. BROOKS: Very good.

MR. MANGES: Mr. Hearing Examiner, we just received these documents at 4:30 yesterday, and I have not had a chance to review them with my client. So what I would like to do is take a moment and review them with my client so we can address the issues that are raised.

MR. BROOKS: Okay. It's a little early, but in the interests of efficiency, would it create difficulties for anybody if we took an early lunch and recess.

MR. FELDEWERT: These guys are from Midland. It's already their lunchtime.

MR. BROOKS: Well, let us take a luncheon recess, then, and we will reassemble at 12:30.

[Recess taken from 11:21 a.m. to 12:34 p.m., and testimony continued as follows:]

MR. BROOKS: We're back on the record in Case No. 14116. And I believe, Mr. Feldewert, it's time for you to call your next witness.

MR. MANGES: We get to cross first.

MR. BROOKS: Oh, yeah. That's right. That's why we broke, for you to prepare your cross, okay. You may proceed.

CROSS-EXAMINATION

BY MR. MANGES:

Q. Mr. Worrall, let's talk a bit about the Fasken No. 1. I think you characterized that as a wildcat well; is that right?

A. Yes.

Q. And it encountered two zones of production, the Strawn at 12,000 feet, right?

A. Yes.

Q. And the Morrow at 12,900?

A. Yes.

Q. Okay. And Fasken considered each zone marginal; is that correct?

A. Each zone marginal?

Q. Yes.

A. Based -- I'm not sure what you mean by that.

MR. MANGES: May I approach the witness?

MR. BROOKS: You may.

Q. (By Mr. Manges): I'm going to hand you a document that's been produced by Fasken. It's document 0494 and it was --

MR. FELDEWERT: Do you have a copy? May I see it?

Q. (By Mr. Manges): It was submitted to the State in connection with an application for commingling.

A. Do you have the date of that? 2004?

Q. About that.

MR. FELDEWERT: I don't see a date there, Mr. Manges.

Q. (By Mr. Manges): I'll go ahead and hand you this and ask you to read the two or three sentences in the first paragraph. And if you could read that out loud so we can all follow along with you.

A. Starting this sentences right here and then that --

Q. Just the first paragraph is fine.

A. Okay. "Production curves in the Morrow and Strawn zones are not available since these are new completions in this well. Each zone is considered marginal. Combining two marginal zones will provide a more reasonable economic return. The combined total production from both zones is estimated to be 750 MCF gas per day."

Q. Okay. Now, in fact, were the two zones -- or was that well commingled?

A. Yes, it was.

Q. Was the approval given?

A. Yes, yes.

Q. All right. And let's turn to the Fasken No. 2. Your primary goals here are the very same zones, aren't they?

A. Yes, they are.

Q. And that's, in other words, a deep gas well that's proposed?

A. Yes, 13,400.

Q. Now, in your experience, of course, it's possible to drill a dry hole, right?

A. Yes.

Q. And, in fact, if we look at your Exhibit No. 18 -- why don't you go ahead and pull that out. There are a number of dry holes depicted in the areas of Section 16, aren't there?

A. Yes, at different depths depending on which one you're looking at.

Q. And I counted one, two, three, four, five, six -- six or so dry holes in Section 16. You see those?

A. Yes.

Q. And then there's a couple more in Section 15?

A. Yes.

Q. One, two, three, four in Section 21, right?

A. Yes.

Q. And then it looks like on the east side of Section 17 another one?

A. Yes.

Q. And in Section 9?

A. Yes.

Q. And you testified when you analyzed this well, you thought there was a 50/50 chance for success?

A. Yes, I did. For the Strawn and Morrow reserves.

Q. And so, in fact, there's really no certainty at all that there's oil and gas down there in that formation, right?

A. I would characterize it as a 50/50 proposition.

Q. Okay. In the event that there's no production, then obviously there will be no royalties to the State, right?

A. If you drill a dry hole, yes, that's correct.

Q. And, in fact -- well, let's turn to -- let's turn to Exhibit 25. Pardon me -- yeah, it's 24 -- which is your economic analysis.

MR. FELDEWERT: Mr. Examiner, this is not his economic analysis.

Q. (By Mr. Manges): An economic analysis. Now, in your direct examination, you testified, I believe, that there is a difference in cost between drilling a straight hole or a horizontal hole -- pardon me -- a vertical hole and a slant hole, right?

A. Yes.

Q. And I think you testified there will been a difference between approximately 4. -- why don't you give us that number.

A. As I understand it, the AFE Fasken has prepared

is $4.4 million for a vertical well and $5.9 for a slant hole.

Q. Okay. And based on your analysis, you said that you would not recommend drilling a slant hole; is that correct?

A. Yes, that's correct.

Q. Does that mean that you would not -- or you would not -- that Fasken wouldn't drill a slant hole in any case if this application were denied?

A. You'll have to ask that question of Fasken. I don't speak for them.

Q. All right. And one of the reasons I think I heard you testify was there may be some shallower zones that a vertical or horizontal -- a vertical well would capture that a directional well may not; is that right?

A. Yes.

Q. Now, in this case, isn't it true that in Section 16 there hasn't been -- or at least let's start with Fasken No. 2 -- that there was no intermediate or shallow zone that was penetrated that produced oil; isn't that true?

A. Yes. And you need to keep in mind all those dry holes, most of them only went to 2,600 feet. They didn't even get to the Delaware, Bone Spring, Wolfcamp Formations. Only one well has, and that's ours. So that's all we have to go off of.

Q. And that's the Fasken No. 1.

A. So in the southeast/southeast, at least for that

eight inches that we drilled, we didn't see them. Half a mile away, can things change? Yes.

Q. Based on your experience anyway, in Section 16 -- in that portion of Section 16, you didn't discover any oil in the Delaware or --

A. True.

Q. All right. And as far as the target goes, there's either oil in the Morrow and the Strawn or there isn't; isn't that true? The target location?

A. Yes.

Q. So your chances for success are 50/50 whether you directionally drill or whether you were to drill vertically; isn't that true?

A. Yes, as far as the Morrow and the Strawn. Whether they're there or not is a 50/50 proposition.

Q. Right. And whether they're there or not won't change as to whether you directionally drill or not?

A. No. Not to that part of it, no.

Q. Okay. So the additional cost that you would bear, this $1.5 million, would be borne out of the production if it's there or not; isn't that true? Out of the Strawn and the Morrow?

A. It would be borne out of production from the Laguna 16 State No. 1 or 2? I'm not sure I follow.

Q. I'm sorry. Let me rephrase the question.

All I was saying is that if you do directionally drill, that $1.5 million of additional cost will borne out of the production out of Morrow or Strawn if it's successful in any event; isn't that true?

A. We hope to pay out the well, certainly.

Q. Okay. Let's look at one exhibit that you prepared, and this is Exhibit No. 21, and it's your halfway field history?

A. Yes.

Q. And you analyzed the logs and made some notes about production casing. What was the point of that?

A. The point of this study is to analyze to see when the wells were drilled, the history of the well, see how they were cased and what were the current status of the well bores.

Q. Okay. But why did you do that?

A. To study the wells and understand where there was casing or not.

Q. All right. And what was the significance, in your mind, of whether there was casing there or not?

A. If I was mining the area, I think I'd want to know if those wells had casing in them or not for safety issues.

Q. All right. And you're not a mining engineer?

A. No, I'm not. I'm a geologist.

Q. Any background in potash mining at all?

A. No.

Q. And what -- you say -- you mentioned safety issues. What are you talking about?

A. Currently, what we were given from R-111-P is we need to stay a quarter mile away with an oil well, a half a mile away with a gas well. And they require you put casing over those wells. Those are the guidelines that we live by, so we were making sure we had casing -- looking to see if these wells had casing or not, assuming that means whether you can mine or not.

Q. Let me ask you whether you reviewed those logs and looked to determine where they were plugged and where the plugs were left in place.

A. These are not logs. This is data. These are OCD-approved plugging reports, is what they are. And I was examining to see where the pipe was set.

Q. Did you look and see where they were plugged as well?

A. Are you speaking to where cement was left in the well bores?

Q. Yes, and plugs.

A. I looked through them and I read them, but I did not make a table or prepare an exhibit to that effect.

Q. And why didn't you note where these old wells were plugged?

A. Where cement is in the wells?
Q. That's correct.
A. I had no -- it just wasn't the purpose of my study.
Q. Okay. You're not familiar with the potash reserves at issue, are you?
A. Familiar in what way?
Q. At all. Are you familiar with -- let me just -- you haven't studied the potash reserves at issue in Section 16, have you?
A. We don't have access to any of the data on that. I have nothing to study.
Q. I'm just asking you whether you studied it at all.
A. The only thing I've ever seen is the BLM map.
Q. Okay. And so with respect -- I'll tell you what I'm getting at. If you look at your Exhibit No. -- the one with the circle -- Exhibit 22 where you've drawn these various circles.
A. Yes, sir.
Q. Okay. Now this study is not based on -- has nothing to do with your analysis of the potash reserves at issue, does it?
A. All this is, is a radius map trying to depict where there's pipe or not.

Q. And again, this raises the question about why this map was prepared because what you are depicting here is that, at least in your opinion, the potash can't be mined within these circular areas; is that correct?

MR. FELDEWERT: Object to the form of the question. He's not tendered to offer an opinion on that and was not tendered to offer an opinion on that.

MR. BROOKS: Well, I think he can clarify what's indicated on the exhibit. I'll overrule the objection.

Q. (By Mr. Manges): Why don't you go ahead and indicate the purpose of this Exhibit 22. Why did you prepare this?

A. The purpose of the exhibit would be to show the quarter and half-mile boundaries. These come from the R-111-P, a joint document and done by the potash and oil and gas industry to show how you can drill or mine within areas around an LMR. And purpose of the color coding is just to show those quarter miles where you have that casing string over the salt and where you don't. And if there is, then someone decides there is a safety issue. I'm not purporting to know. I'm not an engineer in potash to say that.

Q. Okay.

A. I raised the issue.

Q. You have no scientific background or basis for whether or not these circles depict where potash could be mined

or not; is that true?

A. No. That's not the purpose of the exhibit.

Q. Based on your experience in the oil and gas arena, it would be possible to successfully directionally drill the Morrow 2 from the Morrow 1 pad; isn't that true?

A. It is possible and does pose additional risks.

Q. And I believe you said there were mechanical risks involved?

A. Yes.

Q. But is there anything in your study that you reviewed that would indicate that it was impossible for this well to be directionally drilled?

A. What can happen is you can get stuck and lose your well and that would make it impossible. You may have to start over again if that happens.

Q. Okay. And that is the same risk that is true of other wells as well; isn't that true?

A. Very much so, but it's just accentuated when you're not dealing with a vertical situation, as you can imagine, it creates additional risk.

Q. So there's additional risk and there's some cost, the ones --

A. Yes.

Q. But otherwise it would be possible to drill the well directional, right?

A. For the --

MR. FELDEWERT: Object to the form of the question. Are you talking technologically possible?

MR. BROOKS: Well, I believe the witness has already testified that it would be possible. I assume that means technically possible. If he's going to ask about economics, I assume he'll ask about it.

Q. (By Mr. Manges): Technically possible is the intent of the question.

A. Technically possible, yes.

Q. Now, since you have recommended that you would not directional drill this project, would you also recommend that Fasken walk away from this project if this APD is denied?

A. What do you mean by walk away from the project?

Q. Not drill the -- directional drill the hole?

A. I don't know how they can drill it if they don't have an approved permit.

Q. No. No. You missed my point. My point is, if this application is denied, okay? And given your recommendation that Fasken not directionally drill it, would it be your recommendation that they not drill at all?

A. Yes. That's what we're saying.

Q. Let me just check my notes real quick.

MR. MANGES: I don't have any other questions, Mr. Examiner. Thank you very much.

MR. BROOKS: Very good.

EXAMINATION

BY MR. BROOKS:

Q. Mr. Worrall, I just have a couple of questions here. The shallow wells that you testified to, did you say they did not go down to the Delaware; is that correct?

A. There was 18 shallow wells drilled -- or 17 shallow wells drilled if you look at that less than 5,000 information. And they all were drilled, like I said, less than 5,000 feet. The Delaware starts right at 4,900 feet.

Q. What formation were those wells?

A. They were targeting the Yates Formation. That's what the halfway field produces from.

Q. And several of them were producers, were they not?

A. All the ones shown with the green circles would be producers. And the holes were Yates dry holes.

Q. But they're all plugged now?

A. They're all plugged now.

Q. And are any currently producing wells in this Section 16 other than the Laguna State No. 1?

A. No, sir.

Q. That Nearburg, was that a Delaware well?

A. The Nearburg well went to 5,300 feet, approximately, and it tested the very top couple 100 feet of

the Delaware. It didn't have a test for the other two or three thousand feet. So it's a shallow Delaware test.

Q. Was it a producer?

A. It was a dry hole.

Q. Okay. Have you looked at this Exhibit 8 that Ms. Kvasnicka identified that was one of the potash company's documents?

A. Yes. I saw that in Fasken's office.

Q. Now, if I understood the testimony correctly, this lighter -- the not so bright and more red, deeper red color is the mining company's LMR. Is that the way you understand it?

A. I've never seen the LMR maps. I have no basis for that other than just that map.

Q. But did you understand the map that way, though?

A. Yes.

Q. And the red lines you understand to be -- other than the red circle that Ms. Kvasnicka added on here -- you understand those red lines to be the potash company's mine workings?

A. That's what they indicated, yes.

Q. So up in Section 9, there's mine workings up in Section 9?

A. Yes. If you look at those wells that are shown there, they're 330 feet from the south line, so their mine is

north of that about 150 feet or so.

Q. Okay. Did you -- let me go at it this way. Looking at Fasken's Exhibit No. 14, your isopach --

A. Yes, sir.

Q. -- the way you've dawn this -- well, first of all, let me ask a couple of questions about it.

There's a red note up here in the northwest quarter of section -- on the north half of Section 16. There's something written in there in red. I can't read it. It's too small.

A. Would you like for me to read it?

Q. Would you, please?

A. It says, "Mineral and surface, State of New Mexico, oil and gas lessee, Fasken Oil and Ranch" --

Q. Okay. I'm sorry.

A. "Potash lessee none."

Q. So that's just an ownership note. It doesn't have anything to do with the interpretation of the map, okay. That George Federal No. 1, I believe I've heard some testimony about that in a previous case. That's a pretty good well, is it not?

A. It is. It's named after my father-in-law, in fact.

Q. Congratulations. What caused you to put the three-foot contour line with the oval to the north there going

along the boundary between 9 and 16?

A. Okay. What this is, this is a petro map. Actually I didn't draw these contours. This is the computer interpolating in between the data points.

Q. Okay. So it's just an interpolation?

A. Yes. Just an interpolation.

Q. But based on this map and the interpretation that's given here, other things equal, you would assume that the farther you would go to the north, the better, right?

A. Yes. Just common sense.

Q. So presumably, then, the reason you didn't locate this well farther to the north in Section 16 was because of the mine -- the proximity to the mine workings up in Section 9; is that correct?

A. No, sir. We have some seismic data that we were using when we chose our first location. And we used that -- that seismic data guided us towards our first location.

Q. You're talking about the No. 1?

A. The No. 1.

Q. Okay. I was thinking about the No. 2 because the No. 2 is considerably to the south.

A. I'm sorry?

Q. It could be up to -- under OCD rules, it could be up to 660 feet from the north line.

A. Yes, sir. We very much tried to scale off of

that when we amended our location to be at least half a mile away from their mine.

Q. Okay. That's what I was thinking. Thank you.

MR. BROOKS: That's all I have. Mr. Warnell?

EXAMINATION

BY MR. WARNELL:

Q. I have one question on your Exhibit 15. Exhibit 15 in the cross section there. I guess that's the Lower Morrow in the first two wells on the George Federal No. 2. In the depth tract, is that some kind of a plug or packer?

A. Yes. This interval right here is below a packer in the Lower Morrow. These are little Morrow sands that are productive.

Q. Okay. In the Lower Morrow, then, on the first two wells, it was perforated, tested, and then squeezed off? Or what is that indicating the X there?

A. Okay. The George No. 1 initially they produced the Lower Morrow and then they did a workover a few months later to the Middle Morrow and made it a much more significant well. The well is currently making over a million a day.

Q. And it's all from the Middle Morrow?

A. What they did is they set a plug -- when they changed from Lower Morrow production to Middle Morrow, they set a cast iron bridge plug, and that's what that shows right

there.

Q. So it is perforated pipe --

A. It's perforated below that and shut off with that case iron bridge plug.

MR. WARNELL: Okay. Thank you. I have no further questions.

MR. BROOKS: One further thing I wanted to ask you. Now, Mr. Manges said something about oil, and I think he was -- I'm not sure what he was speaking of, but I think he may have not been being precise. The Morrow and the Strawn prospects are gas; are they not?

THE WITNESS: You know, it's been interesting. They started off about 30 barrels a day and 400 MCP a day and they have both steadily increased and they currently make about 60 barrels a day and about 900 MCF a day. It's been a well that's increased, but they make both products.

MR. BROOKS: This is in the Laguna No. 1?

THE WITNESS: It's in the Laguna No. 1.

MR. BROOKS: What are you primarily thinking in the shallower zones? Are you thinking gas or oil?

THE WITNESS: Oil and Bone Spring are almost always oil with a little associated gas. And they're usually developed on 40 or 80-acre spacing.

MR. BROOKS: And the Delaware is usually oil, too, is it not?

THE WITNESS: Yes, it is.

MR. BROOKS: That's all. Redirect?

MR. FELDEWERT: I have no further questions.

MR. BROOKS: Recross?

MR. MANGES: Only one question. You mentioned seismic data was used.

THE WITNESS: Yes.

MR. MANGES: And that's to locate the Fasken No. 2 location?

THE WITNESS: No. 1 location. We didn't use it for the No. 2. We were mainly just going off the first well and trying to stay half a mile.

MR. MANGES: Okay. Thanks.

MR. BROOKS: Okay. You may stand down. You may call your next witnesses, Mr. Feldewert.

MR. FELDEWERT: Mr. Examiner, we would call Tommy Taylor.

TOMMY TAYLOR

after having been first duly sworn under oath, was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. FELDEWERT:

Q. Would you please state your name for the record.

A. Tommy Taylor.

Q. Where do you reside?

A. Midland, Texas.

Q. And by whom are you employed and in what capacity?

A. I'm the drilling manager for Fasken Oil and Ranch, Limited.

Q. Do you assist the company in making decisions about what oil gas projects to pursue?

A. I do.

Q. Do you also oversee and review the drilling and engineering aspects of Fasken Oil and Gas' projects?

A. Yes.

Q. Have you previously testified before this Division?

A. Yes. Yes, I have.

Q. And at the time of your testimony were your credentials an expert in petroleum drilling and engineering accepted and made a matter of record?

A. Yes.

Q. And are you familiar with the application that Fasken has filed in this case?

A. Yes.

Q. And have you conducted a study of the proposed well that is at issue?

A. Yes.

MR. FELDEWERT: I would tender Mr. Taylor as an

expert witness in petroleum engineering.

MR. BROOKS: Objection?

MR. MANGES: No objection.

MR. BROOKS: So qualified.

Q. (By Mr. Feldewert): Mr. Taylor, would you turn to Fasken Exhibit 6. Do you see on Exhibit 6 the stamp states that in July of 2003 that the commission determined that it was not in the best interest of the trust to issue a potash lease in Section 16; do you see that?

A. Yes.

Q. Were you here for the testimony where we read from Ms. Bailey's letter that that decision was made due to the potential of additional drilling in this section?

MR. MANGES: I'll object to this. This is hearsay and we've kind of gone over this, so it's been asked and answered as well.

MR. FELDEWERT: I just asked if he was here when they read this statement.

MR. BROOKS: Okay. I guess that's not an objectionable question. Overruled.

Q. (By Mr. Feldewert): Okay. Do you agree with this determination by the State Land Office, and if so, why?

A. Yes, I do. With the existing well bores already in Section 16, it would be prudent to allow oil and gas development to take place before potash mining. A couple of

reason: You know, once our well would be drilled and developed and completed and plugged according to the stringent casing and cementing plugging requirements set forth in R-111-P, then potash mining can take place. And if potash mining took place prior to us drilling the well, we could not drill a vertical well through the potash mining because of subsidence and caverns. If the potash mining is done prior to that, then the oil and gas below it would be wasted.

Q. Now, you say that the State Land Office made a correct determination. Is that based in part also on some economic studies that you've done on the feasibility of drilling a directional well as Intrepid proposes?

A. Yes.

Q. Okay. Just focusing now on Section 16, before I get to these economics, is it your opinion as an expert petroleum engineer that it would be in the best interests of the State to allow oil and gas recovery in Section 16 before attempting to recover any potash reserves?

MR. MANGES: I'm going to object to that question, the form of that question. This witness can't speak for the State of New Mexico. And I think that's what this question is directed to. So I don't think it's within his expertise as an engineer.

MR. BROOKS: I'll overrule the objection.

A. Well, I believe it would be a win/win scenario.

It would allow us to recover any remaining oil and gas in this part of the section, and then after it was recovered, then the mining for the potash could continue in this part of the section.

Q. (By Mr. Feldewert): Or actually not continue, but they could attempt.

A. Well, the could attempt it, right.

Q. You're not aware of any potash mining in this section?

A. That's right.

Q. Let me ask you this: Now, they have suggested that Fasken should directionally drill from the Laguna No. 1 down there in the southeast quarter of the southeast quarter of Section 16. Can you, as an expert in petroleum engineering, outline the mechanical risks that are associated with such a directional drilling proposal?

A. Yes.

Q. And I should preface. I want to focus it specifically to a directional drill at this length to this depth, which we're talking about the Morrow Sands.

A. Right. It's a long reach from No. 1 to the No. 2 well. It's about 3,300 feet of vertical section to reach it. And the kickoff point would have to have below our intermediate casing string in the Delaware.

And Delaware rocks are tough to drill directionally

in because you have dog legs and key seating problems. And when you have key seating problems, it can lead to a lot of other mechanical risks in the well such as stuck pipe, fishing problems, risks, drill string failures, additional casing wear, excessive torque and drag.

And also it could prevent us from properly evaluating the Strawn and Morrow Formations with electric logs and drill stem testing if we had enough drag in the hole.

Q. Is the function of this risk associated with not only the distance but also the depth that you would have to go to reach the Morrow Sands from the Laguna No. 1 location?

A. Yeah. I mean, the further the reach, the deeper the well bore, the longer you're going to be in the well, the more you're going to be turning the string, the drill string, the more likely you're going to have key seating problems.

Q. Now, you mentioned key seating problems. Can you just give us a brief of what that means?

A. Well, a key seat would be where the drill string is wearing in the section of the well where you kickoff or any part of the well where you have a dog leg. We would be drilling an 8 1/2 inch hole in this section of the well. And you have -- when you're drilling further down, you have a lot of lateral force on your drill string which will be 4 1/2 inches.

And what you end up doing is wearing a track in the

topside of the hole where the pipe is while you are drilling. And then when you want to come out of the hole and you pull your tools or your drill collars that will be 6 1/2 inches up into that reduced section of the hole, and you'll become stuck.

Q. Do you also have casing wear concerns when you try to directional drill like this?

A. We do because of the extra torque in the well. And, you know, every well is different. But when you're turning and you have torque at the bottom of the well then you can have additional wear inside your casing strings.

Q. Is there -- the fact that you're not only directionally drilling at and this depth and this length, does the fact that you're drilling for a gas formation also add to the risk of mechanical concerns here?

A. It certainly does. I mean, you start talking about well control issues, if you drill in and take a kick or you're making a trip and you have some gas in the hole and you become stuck, it gets very complex very quick. You can't get back to bottom. It makes it very difficult to control the well if you run into this situation.

Q. So as an expert in petroleum engineering and drilling, we're all here concerned about safety, okay? Is it safer to drill a vertical hole to this depth for gas or is it safer is to drill a directional well to this gas formation at this depth?

A. It's definitely safer and less risk to drill a vertical well.

Q. Mr. Worrall testified about the potentially productive shallower formations at the proposed location. Will you be able to test or tap into these shallower formations from a directional well that is started at the Laguna No. 1? And I'm talking, for example, at the Bone Spring and the Delaware.

A. No. You would bypass these particular zones. Because we would be kicking off in the Delaware at the No. 1 location and when we went through the Bone Spring, we wouldn't be very far away from the No. 1 well, so the potential to bypass these secondary reserves exist.

Q. In there any way that you could tap these shallower secondary reserve formations with a directional drill from the Laguna No. 1?

A. Not --

Q. If you're going to the Morrow?

A. No, there's not.

Q. All right. Now, have you compared the cost estimate of a vertical well at Fasken's proposed location with a directional drill from the Laguna No. 1?

A. Yes.

Q. And has that been -- let me ask you this: Is Fasken Exhibit No. 23, are those the AFEs that Fasken has prepared for purposes of this hearing to compare the cost of a

vertical well versus a directional drill?

A. Yes.

Q. Okay. And why don't you just identify which AFE applies to which drilling scenario.

A. Okay. The first one in the exhibit is the vertical well. And it's the one that has at the bottom a total cost of a dry hole would be $3.4 -- basically $3.5 million. And a producing well would be $4.5 million. And the second part of the exhibit is a cost estimate to drill a directional well from the No. 1 location to the No. 2 bottom hole location. And at the bottom you can see the dry hole cost has gone up to $4.9 million and completed is $5.9 million. And the difference is approximately $1.4 million. That is considering everything going routine. That's not considering any of these additional problems that we might run into -- hole problems.

Q. Okay. Did you then take these numbers and plug them into a model that Fasken uses to assess the economics of an oil and gas project?

A. Yes, we did.

Q. Is that depicted on Fasken Exhibit No. 24?

A. Yes.

Q. Okay. Would you kind of walk us through what is shown here on Fasken Exhibit No. 24?

A. Okay. This is a risk reserve for an economic analysis sheet. I used the costs that I just read out to you.

And it's kind of an in-house tool which use. It's kind of a red light, green light type analysis. What we're doing is we're using -- on our decision tree -- we're showing we have a 50 percent chance of a dry hole and we have a 50 percent chance of a producer.

Q. You're right in the middle of this?

A. Yeah. I'm right under the decision tree.

Q. Okay.

A. And the 50 percent producer we're saying we have a third of the 50 percent that we will have Strawn and Morrow production, a third Strawn only and a third Morrow only production. This does not consider any up hole potential that we would miss if we drilled a directional well.

And what we show -- if you go to the net BFIT, that would be the net before federal income tax calculations. And if we drilled a vertical well at those costs, we would expect to have a profit of $464,000, using this analysis. And if we drilled a directional well, we're showing we would lose $136,000.

And basically what that says is that the cost of the directional well would not pay out, using these kinds of risk analyses. A vertical well would be a viable project. So this just helps us determine where they would spend our available capital on different projects.

Q. Okay. I just want to make sure I clarify a

couple of things. This is an actual model your company uses to evaluate projects?

A. Yes. And what we used on the production is our ultimate recovery that -- out of the No. 1 well. So it's 1.5 BCP and 86,000 barrels of oil. And then it's split up into each of the Strawn and Morrow only reservoirs.

Q. All right. And a positive number indicates that this would be a viable project. A negative number, using the company's economic analysis, indicates it would not be a viable project?

A. Yes.

Q. Red light, green light?

A. Yes.

Q. Now, let me get to a question that Mr. Manges wanted to ask Mr. Worrall. Because Mr. Worrall couldn't speak on behalf of the company, have you visited with management about the prospect of drilling a directional well from the Laguna No. 1?

A. Yes, I have.

Q. Okay. And what's the bottom line, Mr. Taylor, even at today's prices? Is Fasken willing to spend $5.9 million on a directional well to the Morrow or the Strawn?

A. No, we're not.

Q. And you've confirmed this with your management?

A. Yes, I did.

Q. Okay. Now, I know you had this economic analysis that you utilized. Can you just kind of summarize why your management would make this kind of a decision?

A. Well, it's too much mechanical risk. It's clearly not economic given our probability that we use. And we have other places to risk our capital.

Q. In your opinion, as a petroleum engineer and petroleum drilling expert, will approval of a vertical well at the proposed location allow the economic recovery of commercial quantities of oil and gas reserves underlying the northwest quarter of these lands?

A. Yes.

Q. And that would not be true with a directional well?

A. That's true.

Q. And if you're not approved to drill a vertical well at this location, you're not going to pursue this project?

A. That's correct. The oil and gas reserves would be wasted.

Q. Were Fasken Exhibits 23 and 24 prepared by you or compiled under your direct supervision?

A. Yes.

MR. FELDEWERT: I move the admission of evidence of Fasken Exhibits 23 and 24.

MR. BROOKS: Objection?

MR. MANGES: Which ones? I'm sorry.

MR. FELDEWERT: 23 and 24.

MR. MANGES: That's fine. No objection.

MR. BROOKS: Fasken Exhibits 23 and 24 are admitted.

[Applicant's Exhibits 23 and 24 admitted into evidence.]

MR. FELDEWERT: That concludes my direct examination.

MR. BROOKS: Very good. Cross-examination, Mr. Manges?

CROSS-EXAMINATION

BY MR. MANGES:

Q. Good afternoon, Mr. Taylor. You said in your last comment there that if this APD isn't approved that oil and gas reserves would be wasted, right?

A. That's correct.

Q. Won't that oil and gas still be there?

A. It would be difficult to go test it, if you're allowed to mine ahead of us drilling the well.

Q. But that doesn't answer my question. Won't the oil and gas still be there is this APD is denied?

A. Yes.

Q. It's not going anywhere, right?

A. Right.

Q. All right. Plus, based on the testimony of Mr. Worrall, there's only a 50 percent chance that there's any

there, anyway, right?

A. That's what we used in the analysis.

Q. Okay.

A. But you don't know until you drill it.

Q. Now, you just mentioned something that raises questions. And that is, you stated that you couldn't drill after potash mining because of subsidence and caverns.

A. Yes.

Q. Have you ever supervised the drilling of a well through a potash mine?

A. No, I haven't.

Q. So what's the basis of that testimony?

A. Well, I just don't think you could do it. You'd be crazy to try to do it.

Q. Are you aware there's a study being performed by the BLM and Sandia National Laboratories that's addressing how closely potash mines and oil and gas operations can operate?

A. Just what you've said today.

Q. Are you aware of any oil and gas wells that have been attempted to be drilled through any potash mines?

A. No.

Q. Are you -- okay. So then, obviously, no wells have failed because of an attempt to drill through a potash mine, right? That you're aware of?

A. No. That's correct.

Q. Okay. Let's turn to the economic analysis, briefly. I'm not sure I understand it, but is Fasken actually assigning a true present value of $464,000 to this well?

A. No.

Q. Vertical well?

A. No. It's just a risk reserve calculation just to look and see what the probability is, what the likely outcome is, and whether we would want to proceed on in drilling a well vertical or directional.

Q. Okay. Well, if the expected value -- when do you get to that decision point? Is it $100,000 of expected value? Or how does this work?

A. It would be anything -- what I would say a go ahead number would be anything over zero, given the risk of the project. If it was less than that, then that would be a no-go.

Q. Okay. And have you ever used this model to actually determine whether you're going to drill a well or not?

A. Yes. You mean other wells?

Q. Yes. And how so?

A. Well, just like I stated. You just look at the probability and what you can expect to recover and look at the expected value. A positive expected value makes you lean towards doing the project. If it's negative, you lean towards not doing it. But you have to look at each well case by case with all the risk associated and all the costs associated with

the well.

Q. Now, Fasken certainly has successfully directionally drilled wells; isn't that true?

A. Depends on what you mean by successfully.

Q. Okay. Well, let me just -- it's complete then -- successfully fully completed directional wells?

A. Are you meaning mechanically or are you meaning economically?

Q. Well, let's take it both ways. How about economically first?

A. To my knowledge, we've never had an economically successful directional well.

Q. Okay. Have you ever drilled a directional well?

A. Yes.

Q. How many?

A. Two, personally.

Q. In what formation?

A. One was Morrow was one was Atoka.

Q. And where?

A. One was here in New Mexico, and one was in Texas.

Q. Was the Morrow one in New Mexico?

A. Yes.

Q. And was it successfully completed or was it a dry hole?

A. We ran pipe, but it was not an economic success.

Q. Why not?
A. We didn't have -- the reservoir was completed.
Q. Okay.
A. So we didn't have the reserves.
Q. Now, in that instance, you had all of the structural issues that you testified about earlier, didn't you?
A. We had similar risks.
Q. Structural concerns, I should say?
A. Yes. It's a different -- it's different in that we didn't have a -- we could kick off shallower and we didn't have the salt protection string and that kind of thing.
Q. Okay. But aren't the problems that you testified about with respect to the structural problems of directional drilling, aren't those issues of any directional drilling project?
A. Yes.
Q. That's a general issue that directional drilling presents?
A. Yes.
Q. Not specific to what we're talking about here today which is the Fasken 1 to the Fasken 2 location?
A. Right. One difference is, though, we drilled that when the cost was a lot different than it is today -- significantly different. That well, the additional cost, was in the range of $200,000. And in our well, we're looking at

$1.4 million. And on top of that, we'll also have the additional cost of the protection strings.

Q. Okay. Have you reviewed or studied any of the oil and gas wells drilled through a potash mine or any other mineral?

A. No.

Q. Have you ever reviewed or studied the risks that drilling an oil and gas well either near or next to a potash mine presents to underground miners?

A. Would you repeat that?

Q. Sure. Have you reviewed or studied the risks in drilling an oil and gas well adjacent to a potash mine presents to underground miners.

A. Only in our Laguna 1.

Q. Okay. And what study did you undertake with respect to the Laguna No. 1?

A. Well, just the -- looking at the wells and how -- looking at R-111-P and the requirements for the salt protection string, how they're supposed to be cemented up, how the intermediate string is supposed to cemented to surface, that kind of thing.

Q. Now, are you aware -- we've talked about Fasken's directional wells. Are you aware of other companies who have directionally drilled in the potash enclave?

A. No.

Q. You're not aware of any other directional drilled well in the enclave?

A. No, I'm not. I'm not saying that there's not any. I'm just saying that I have not seen it.

Q. Okay. Let me ask it this way: Given your testimony about the structural issues that directional wells present in your mind, have you taken any action or study to figure out ways to mitigate those problems or lessen them?

A. Are you talking about the mechanical risk of the well?

Q. Yes, I am.

A. I mean, I review it on all our wells, you know. But as far as a directional well in the potash area, the only one I've looked at is this well.

Q. What I'm getting at is whether you have undertaken any efforts to reduce the risk that directional drilling presents. And when I say efforts, I mean study other ways of minimizing those problems.

A. Well, we have our own, what I'd say internal ways, of proposing a well be drilled to minimize these risks.

Q. And have you done that in this case?

A. Yes. I've looked at it. But that doesn't mean that they're not going to happen even though you're trying to prevent them from happening.

MR. MANGES: Mr. Hearing Examiner, we'll pass the

witness.

MR. BROOKS: Thank you.

EXAMINATION

BY MR. BROOKS:

Q. I'm sorry. I don't remember your name.

A. Tommy Taylor.

Q. Mr. Taylor. Good afternoon. There's nothing unusual about directional drilling is there? These days there's a lot of it going on?

A. That's correct.

Q. So even though you haven't personally been involved with drilling many directional wells, it's not an unusual procedure?

A. No, it's not.

Q. And that's true that there are a lot of directional wells that are -- a lot of horizontal wells being drilled in the Delaware in Southeastern New Mexico; are there not?

A. That's correct.

Q. And did you testify that the Delaware was a particularly difficult formation in which to drill directionally?

A. If you're going on deeper and you're in the well a long time, it is prone to key seating.

Q. And why would that be particularly in the

Delaware?

A. It's just -- what I believe it's the rocks in that particular formation. They are just softer, and that lends itself to key seating.

Q. Okay. Let's see if I have any other questions. Oh, yeah. One other.

You testified it would not be prudent to attempt to drill through an area that had been mined, correct?

A. Correct.

Q. Now, do you have an opinion as to how far you need to be away from mine workings to safely drill an oil and gas well?

A. Not other than what the R-111-P states.

Q. R-111-P is concerned with how far you need to be away from -- how far an oil and gas well should be away from a potash mine; is it not?

A. Right.

Q. Rather than vice versa?

A. Right. That's exactly right.

Q. The question I was raising with you is how far, since your expertise is in drilling, how far for safety purposes does an oil and gas well for safety in drilling the oil and gas well have to be away from an existing potash mine?

A. You know, I can't really speak to that because I don't what kind of subsidence they have and how close they can

get. But I'd certainly think if you had subsidence, you would stand a risk of, you know, rupturing your protection string there.

Q. Yeah. And I can understand that. The reason it seems to have some significance to me is that Section 16 itself is not going to be potash mined unless and until the State Land Office decides to lease it for potash mining. So even if the adjacent sections were potash mined, I'm wondering if that would -- if it would still be possible to subsequently drill oil and gas wells within Section 16 if Section 16 itself was not itself potash mined.

A. You're saying the mine would be a half a mile away from --

Q. Well, the mine would be at least as far away as the section on it.

A. Right. Which would be right at a half a mile.

Q. Right.

A. You know, I think it could be -- I don't think at that distance I would be worried about subsidence, a half a mile away.

Q. So you're saying that potash mining in the adjacent sections would not, in your opinion, preclude the drilling of a well at this location --

A. No.

Q. -- after the abandonment of the mine workings?

A. No.

MR. BROOKS: That's all I have. Thank you. Redirect?

REDIRECT EXAMINATION

BY MR. FELDEWERT:

Q. You mentioned -- I'm not sure I get the concept that you would be crazy to try to drill through an area that has been mined by potash.

A. Yes.

Q. Can you talk about why?

A. Well, the first and most obvious would be lost circulation. How could you control loss circulation to make it through the mine. What would be the state of the mine with all this fluid going in, and the other one would be the subsidence. You know, if you could successfully go through it and set a casing string, it would be difficult to cement to surface as the R-111-P says. But then you're concerned with if this subsidence occurs later, it could rupture that protection string. That would be my concern.

Q. Okay. And in the event that the potash, Intrepid Potash, finally eventually came around to mining in the areas in which they have a lease, which is in the adjacent Section 9 and the adjacent Section 17, would the drilling of your well at the proposed location in terms of the oil and gas engineering in the engineering of that well, it's not going to pose a

problem with their mining up to those section lines?

A. No.

MR. FELDEWERT: Okay. That's all I have.

MR. BROOKS: Recross?

RECROSS-EXAMINATION

BY MR. MANGES:

Q. Yes. A couple of things, Mr. Taylor. You mentioned -- you were asked by the Hearing Examiner with respect to an opinion on how far an oil and gas well could safely be mined -- or safety be drilled -- away from a potash mine. Now, in fact, you haven't studied that, have you?

A. No, I haven't.

Q. Okay. So your opinion is not based on scientific evidence or studies or independent work; isn't that true?

A. That's just my opinion based on my experience.

Q. Okay. And I'd like to ask you: Have you ever had any experience drilling through any sort of mine other than potash mines?

A. No. I'm just speaking of drilling experience.

Q. And so when you say this was based on your experience, you're not talking about any experience in terms of drilling adjacent to a mine or through a mine or based on any real life experience?

A. That's correct.

MR. MANGES: Thank you, Mr. Hearing Examiner.

MR. BROOKS: Thank you. The witness may stand down.

MR. FELDEWERT: Mr. Examiner, that concludes my presentation of the case.

MR. BROOKS: Very good. Let's take a 10-minute recess. That would be about right, a 10-minute recess.

For everyone's information, Fasken has five hours and 11 minutes remaining, and Intrepid has six hours and 11 minutes remaining.

[Recess taken from 1:37 p.m. to break 1:48 p.m., and testimony continued as follows:]

MR. BROOKS: We're back on the record. Mr. Manges?

MR. MANGES: Yes, Mr. Examiner, Intrepid has four witnesses this afternoon. We'd like to call Hugh Harvey as our first witness.

MR. BROOKS: Mr. Harvey?

THE WITNESS: Good afternoon. I think I've already been sworn in.

HUGH HARVEY

after having been first duly sworn under oath, was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. MANGES:

Q. Please state your name for the record.

A. Hugh Harvey, Jr.

Q. And please state your position and employer.

A. I'm the executive vice president of technology for Intrepid Potash, Inc.

Q. And what are your duties with respect to that position?

A. Well, in addition to my position as officer of the company, I'm also a director of company. And my ownership in the company, I'm actually one of the two larger shareholders in the company. My duties in the company as an officer tend to be more on the technology side, as my title describes.

My background, I have degrees and mining and petroleum engineering both from the Colorado School of Mines. I've worked in both industries. Almost 25 years in oil and gas production industry. I worked in the cooper mining industry, and I've been in potash since 1998.

Q. Let's touch a little bit on your oil and gas experience. Whereabouts was your oil and gas experience?

A. It's all in the Rocky Mountain area of the United States.

Q. Any experience with directional drilling?

A. Yes. Significant directional drilling experience, both on oil and gas projects as well as potash mining projects. At Intrepid we developed a potash solution mining technology that we use at our Moab which relies on multilateral horizontal drilling to develop potash solution mining caverns. And we got involved in the potash business in

2000, drilled cavern systems in 2002 and 2005. Those were very successful. We were able to leverage off that success and buy additional potash mining properties both in Utah and also in Southeast New Mexico.

MR. MANGES: At this time, I'd like to tender Mr. Harvey as an expert for Intrepid in the areas of petroleum geology as well as mining engineering.

THE WITNESS: Petroleum engineering and mining engineering.

MR. FELDEWERT: I'm confused. Is it going to be petroleum engineering or petroleum geology?

MR. MANGES: Petroleum engineering.

MR. FELDEWERT: And then mining engineering?

THE WITNESS: Yes. Also. I also will mention that I'm in charge of preparing the reserve reports that are used by the Securities and Exchange Commission for our mining company. In the past, I prepared reserve reports for our oil and gas properties when we were in that business.

MR. FELDEWERT: May I just ask a couple of questions?

MR. BROOKS: Okay.

VOIR DIRE EXAMINATION

BY MR. FELDEWERT:

Q. Do you have a degree in petroleum?

A. Yes. I have a Master's of engineering in petroleum engineering.

Q. A Master's in petroleum engineering?

A. Right. And a Bachelor's of Science in mining engineering.

Q. And have you worked as an engineer in the oil and gas arena?

A. I have. I started my oil and gas career as an engineer for Texas Oil and Gas Corporation.

Q. What did you do for them?

A. Well, it was drilling and production.

Q. And your title with them was petroleum engineer?

A. Petroleum engineer.

Q. And how long were you with Texas Oil and Gas?

A. About two and a half years.

Q. And then what did you do?

A. I was a petroleum engineer and later promoted to district manager for Trigg Drilling Company. And that, again, was their district office in Denver, Colorado, Rocky Mountain District.

Q. Okay.

A. And that was from 1980 to 1984.

Q. I didn't see a residence. I thought you were all going to produce resumes. Did you --

MR. MANGES: May I approach counsel?

MR. BROOKS: You may.

MR. MANGES: This didn't get over to you.

Q. (By Mr. Feldewert): Okay. Have you ever worked in New Mexico?

A. As a mining engineer?

Q. As a petroleum engineer.

A. I worked on drilling, I believe, two wells during my career at Texas Oil and Gas up in the San Juan Basin area.

Q. What kind of wells?

A. They were gas wells, infill drilling dually completed in the Mesaverde and the Dakota formation.

Q. Okay. Do you have any experience in Southeast New Mexico?

A. Not as a petroleum engineer, nope.

Q. Anywhere in the Permian Basin?

A. No. I've not worked in that area.

Q. Okay.

A. I'd have to add to that that I studied the oil and gas industry -- I would say more than just peripherally -- around our potash mine workings.

Q. It looks to me, based on your resume, that you were a petroleum engineer for roughly six years?

A. Probably more like 20 years. 1978 is when I first started working in the oil and gas industry. I was granted my degree in 1980.

Q. Are you counting when you were with Harvey Operating?

A. Yes.

Q. I see. I'm sorry. I didn't realize it --

A. Harvey Operating Production Company was an independent production company. I started it in December of 1984.

MR. FELDEWERT: Okay. You're tendering him as a -- can you repeat that, please?

MR. MANGES: We're tendering him as an expert in field of -- as a mining engineer and as a petroleum engineer.

MR. FELDEWERT: No objection.

MR. BROOKS: So qualified.

DIRECT EXAMINATION (CONT)

BY MR. MANGES:

Q. Mr. Harvey, would you please generally describe Intrepid's operations in the potash basin near Carlsbad?

A. Yeah. We have four mines in Southeast New Mexico in what's generally known as the potash producing area. Two of those mines are active underground mines, which we call our West Mine and our East Mine. And we got involved -- and we've got two additional mines down there. One is a currently closed mine that was the old PCA Mine. We now call it HP Potash. And that's currently being permitted to convert it to a solution mine, NC2 mine.

Then we've got our North Mine. And the North Mine has active surface facilities. That's where we run our

compaction, granulation and load-out for our material, for our red granular product.

Q. Mr. Harvey, let me interrupt you. I'm sorry. Why don't you go ahead and pull out Intrepid Exhibit No. 1 and that might be useful for you to use while you're describing Intrepid's operations.

A. Good idea.

MR. BROOKS: Do we have Intrepid Exhibit No. 1 somewhere in this? The first on here is 2. Here's 1. This Exhibit 1. Sorry about that.

Q. (By Mr. Manges): Okay. Can you describe Exhibit 1?

A. Yes. This is a map of what's generally known as the Secretary's Potash Area. Some people call it the Potash Enclave where special drilling rules apply, special potash leasing is allowed. And it's the area where all the potash mining in New Mexico has taken place. At one time there were seven active mines in this district.

Q. And is this a true and accurate copy of the Potash Enclave?

A. Yes.

MR. MANGES: All right. I move the admission of Intrepid Exhibit 1.

MR. FELDEWERT: No objection.

MR. BROOKS: Okay. Intrepid 1 is admitted.

[Respondent's Exhibit 1 admitted into evidence.]

Q. (By Mr. Manges): Why don't you go ahead and describe Intrepid's operations. I know you've generally described them, but why don't you be a little more specific in terms of the mines.

A. Okay. Our West Mine, which is over on this side, on the west side of the enclave, is a currently active shaft mining operation. The East Mine is the same type of operation where we've got underground miners at work. Over here in the northwest part, what's marked HP Mine, that's where our solution mine is going in.

And then we've got the north mine, which is right next to Section 16 here where the Fasken oil well has been proposed. And that is where we have our compaction granulation load-out facilities. And I'm just going to go ahead and focus on the North Mine because that would get us right to the point of the discussion here.

Q. Let me ask you a question. In the middle of the map -- not in the middle, but in the center -- there's Section 16, Fasken Oil Laguna 16 State 2; do you see that?

A. Yes.

Q. Okay. Is that the location and the section at issue here?

A. It is.

Q. And does it lie adjacent to the North Mine?

A. It is.

Q. Okay. Let me ask you a few more questions about this map. What does the blue indicate?

A. Well, the Bureau of Land Management is charged with protecting potash out here that is above a certain grade and thickness. And that's what they call measured ore. And the blue is what the BLM's opinion is of where the measured ore is out here. It's a little bit complicated that there's actually 10 ore zones out here, so there may be two or three zones stacked on top of each other that are all in the blue area. You just -- it's not really quantified there.

So it's either, you know -- it's either in the protected area or it's not. And then the white areas are what they call indicated ore, which is there's evidence of material out there, mineralization but it doesn't meet the standard that the BLM has set to protect it. And then --

Q. Let me ask you one question on the blue before we go on. Is Section 16 in the blue measured ore category?

A. It is.

Q. And that's the entire section?

A. Right.

Q. Okay. I'm sorry. Go ahead.

A. So anyway, the white is the indicated ore. The next lowest is the inferred ore zones. You can see the color code at this lower left. And then finally, the barren ore

zones where there's either not enough evidence to show potash in place or the evidence is that there isn't any.

Q. Okay. Why don't we go ahead and take a look at Exhibit 2, and have you describe what that exhibit depicts. Again, this is you BLM resources map. You see that?

A. Yes.

Q. And this also has blue BLM measured ore on it; is that right?

A. That's correct. This is essentially an enlarged area of the Section 16 in question and the surrounding sections.

Q. And now, when you said BLM measured resource classification, you're referring to BLM standards, not Intrepid's own standards; is that right?

A. That's correct.

Q. Okay. All right. Let's -- is Intrepid Exhibit 2 a true and accurate enlargement of the BLM resource map?

A. Yes, it is.

Q. And it shows -- why don't you point out the two circles and what they show.

A. Well, the existing Laguna 16 State No. 1, which is a producer of gas and oil from the Morrow and Strawn Formation is spotted on the map in the southeast/southeast of Section 16, and around it is a circle of a half-mile radius. And that represents the half mile that is contemplated under

R-111-P around what they call a deep well. And then the proposed Laguna No. 2 location also has a similar half-mile circle around it.

MR. MANGES: Okay. We move the admission of Exhibit 2.

MR. FELDEWERT: Mr. Examiner, may I ask a couple of questions?

MR. BROOKS: You may.

MR. FELDEWERT: Mr. Harvey, does the Laguna No. 2 location shown on this map, do you purport that to be the location that was testified to this morning, or is that the old location?

THE WITNESS: I believe that's the new location.

MR. FELDEWERT: You don't know?

THE WITNESS: I don't know for sure.

MR. FELDEWERT: You didn't prepare this?

THE WITNESS: No. It was prepared by our staff.

MR. FELDEWERT: Is someone going to testify today as to how this was prepared?

THE WITNESS: Yes.

MR. FELDEWERT: Who's that?

THE WITNESS: Jim Lewis.

MR. FELDEWERT: All right. So you wouldn't be able the tell me why a circle wasn't drawn around the Laguna No. 1?

THE WITNESS: I believe there is a circle around it.

MR. FELDEWERT: A half-mile radius circle?
THE WITNESS: Yes, there is.
MR. FELDEWERT: The Laguna No. 1 down in the southeast quarter of the southeast quarter?
THE WITNESS: There is on mine.
MR. FELDEWERT: I'm looking at what you sent me.
MR. MANGES: That's not the same.
MR. FELDEWERT: Do you have another copy?
MR. BROOKS: The one in my book is the same as Mr. Feldewert's.
MR. MANGES: Okay.
MR. BROOKS: And Mr. Warnell's book is the same as the one you have, so there's --
MR. MANGES: We'll straighten it out.
MR. FELDEWERT: Do have you it? Now, this map also doesn't show all of the existing well bores in this particular area, does it?
THE WITNESS: Well, it shows the oil and gas activity and also the potash core holes.
MR. FELDEWERT: Do you have exhibit -- can you look at our Exhibit No. 2?
THE WITNESS: This one here?
MR. FELDEWERT: No. It should be No. 2. It's the --
THE WITNESS: There we go.
MR. FELDEWERT: Okay. Do you see the well up in the

left-hand corner of this exhibit, Fasken Exhibit No. 2, that is location in the southeast quarter of the southeast quarter of Section 8, the Argo Burner well? It's up in the left-hand side of Exhibit No. 2.

THE WITNESS: The only one I have is in the southeast/southeast of Laguna No. 1.

MR. FELDEWERT: Let me reorient you. Exhibit No. 2, go to the upper left corner of the exhibit, which is in Section -- at Section 8.

THE WITNESS: Okay. Nope. It's not on our exhibit.

MR. FELDEWERT: It's not on your exhibit. Do you know why?

THE WITNESS: I don't know if that well exists or not.

MR. MANGES: We'll withdraw the exhibit at this time. I'll have another witness authenticate this.

MR. FELDEWERT: Okay.

Q. (By Mr. Manges): I'd like to have you take a look at Exhibit 7. Pardon me, Exhibit 5. And those should be a potassium lease, what you've got here on the front page?

MR. FELDEWERT: I have -- what is it? I think I've got it. What's the document number?

MR. MANGES: It's 1415.

MR. FELDEWERT: Okay.

Q. (By Mr. Manges): Okay. What's Exhibit 5?

A. It is a potassium lease from the Bureau of Land Management.

Q. And is this a true and accurate copy of the lease?

A. Yes.

Q. It covers Section 6, 7, 17 and 20, Township 20 South, Range 32 East; is that right?

A. Yes.

Q. And is this one of the Intrepid's leases in this North Mine area?

A. Yes.

Q. And is this lease valid and in full force and effect?

A. Yes.

Q. And then I'd like you to turn to Page 1438 on that exhibit, Exhibit 5, and that should be the second potassium lease. Do you see that?

A. Yes.

Q. And this lease covers Sections 8, 9, and 10, 20 South, 32 East; is that right?

A. Yes.

Q. And that would include, again, some of Intrepid's reserves or leases in the North Mine area; is that right?

A. That's correct.

Q. Okay. And is this a true and accurate copy of

the lease?

A. Yes, it is.

MR. MANGES: I move the admission of Intrepid Exhibit 5.

MR. FELDEWERT: What's your page numbers? My Exhibit 5 has numbers on it.

MR. MANGES: Okay. 1415 through 1460.

MR. FELDEWERT: 1460. There's a letter at 1423. Are you intending to include that?

MR. MANGES: That's part of the application of assignment of 1423.

MR. FELDEWERT: I don't have an objection to the documents that we're discussing, Mr. Examiner. I'm just a little worried having not gone through this about the documents that have not been discussed. So perhaps if it's just limited to what's been discussed, I don't have an objection.

MR. BROOKS: Well, I'm going to admit Exhibit 5. If you have any specific objections, you can raise them later in the proceeding and we can address them at that time.

[Respondent's Exhibit 5 admitted into evidence.]

MR. FELDEWERT: Okay.

Q. (By Mr. Manges): Okay. Mr. Harvey, I'd like you to turn to Exhibit No. 7 at this time and identify this exhibit. And this is Bates No. 1162 to 1170.

A. Yes. This is Intrepid Potash's application for a

potassium lease in Section 16 of 20 South, 32 East, Lea County.

Q. And would that Section 16 be the same section that's at issue here?

A. It is.

Q. And was this lease application submitted under your direction and authority?

A. Yes.

Q. And is this a true and accurate copy of the lease application?

A. Yes.

MR. MANGES: We move the admission of Intrepid's Exhibit 7.

MR. FELDEWERT: And the page numbers are?

MR. MANGES: 1162 to 1170.

MR. FELDEWERT: No objection, Mr. Examiner.

MR. BROOKS: Okay. Exhibit 7 is admitted.

[Respondent's Exhibit 7 admitted into evidence.]

Q. (By Mr. Manges): And I'd like you to turn to Intrepid Exhibit No. 8 and please identify No. 8 for us.

A. Yes. This is an application by Intrepid to the Bureau of Land Management for what's called a fringe potash lease in Sections 21, 26, 27, 28, 29, Section 20 South, 32 East.

Q. Are these leases in the area of Section 16 at issue here?

A. Yes.

Q. And are they adjacent to Intrepid's North Mine?

A. Yes, they are.

Q. Is this a true and accurate copy of the letter that was submitted to the BLM for the lease?

A. Yes, it is.

Q. Was it submitted under your authority and direction?

A. Yes.

MR. MANGES: I move the admission of Intrepid Exhibit 8 which is Pages No. 87 through 89.

MR. FELDEWERT: No objection.

MR. BROOKS: Exhibit 8 is admitted.

[Respondent's Exhibit 8 admitted into evidence.]

Q. (By Mr. Manges): Mr. Harvey, it appears that Intrepid is acquiring or attempting to acquire additional lease acreage near the North Mine. Would you explain to the Hearing Examiner what Intrepid's interest is in that area?

A. Yes. The North Mine is actually one of two major expansion assets that are owned by Intrepid Potash. The first I already referred to by our HP solution mine. The second is the North Mine which was open by National Potash Corporation in 1957 and closed in 1982. Our interest in this mine is to reopen it has a producing potash mine.

Q. And what significance are these additional leases

to that interest?

A. Well, they, together with Section 16, make up what's called a logical mining area for a potash mine. And that, of course, includes not just the potash resource underneath it, but also simply the logical area to develop our mining activities in that area.

Q. Now, what -- you mentioned solution mining technology. What other new or different technology has Intrepid developed in potash mining?

A. Specific to this section, I'd like to address the conditions of the potash mining that were taking place back in 1982. Is that what you're asking about?

Q. Well, I'm actually -- more broader than that, like langbeinite processing and just general.

A. Well, yeah. In addition to the solution mining technology which we're bringing to the potash mining district, we also constructed a langbeinite extraction plant at our East Mine in 2005. And that plant extracts langbeinite which is a valuable mineral sold as a fertilizer. And the prior operator of the mine, which was Mississippi Potash, was simply throwing that material into the tailings pile. So we built a very successful plant which has allowed us to enter that market.

And that is unique technology which was developed by Intrepid to do that extraction process. So we're actually extracting langbeinite and potash out of the same ore zone.

Q. And has Intrepid also developed any exploration technologies that are new and different?

A. Yes, indeed. At the time we bought these properties, if you will, the assets from Mississippi Potash, and took over their work force, there were no geologists at all on staff there. So we came in with our group of geologists and applied technology, mapping technology, to understand all of the potash resources out here using all of the available data which includes the oil and gas data.

It might surprise most people that there's actually 3,300 oil and gas wells that they've drilled in the potash area as opposed to about 1,800 core holes. In addition to that, we've initiated our own surface and underground core drilling programs as well as additional water line logging sweeps that we run on our core holes that were not previously run.

Q. So would it be fair to say that Intrepid uses a great deal more information to evaluate its ore reserves than simply the BLM measured maps?

A. Yes, absolutely.

Q. Has Intrepid also improved processing techniques which result in a greater recovery?

A. Yes, that's true. Most of the processing plants that are in place out here that we purchased were unmodified since the 1960s. So we've come in and instituted a program which allows us to increase the recovery of potash out of each

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ton of ore. Some of this has to do with thickener technology, flotation technology, reduction of brine losses -- there's a whole list of mineralogical improvements that we've instituted or are in the process of putting in.

Q. And as a consequence, what is Intrepid's average recovery rate?

A. Well, at our West Mine, we typically average about 80 percent recovery, 80 to 81 percent recovery -- it depends on the time of the year. At our East Mine, we typically average 75 percent of potash and 38 percent recovery of the langbeinite.

Q. And how does that compare to, say, recovery rates in the early 80s, just for comparison?

A. Well, in comparison, when National Potash closed this mine down here, they were using some rather outdated and energy inefficient technology and their typical potash recovery was around 75 percent.

Q. Let me turn to the issues that are presented here and ask you what is subsidence and how is that a concern for potash mining?

A. Well, I'm going to address subsidence vis-a-vis oil and gas drilling.

Q. Okay.

A. Subsidence per se is not an issue with us as potash miners, but when it comes to oil and gas drilling, it's

definitely an issue and is, in fact, the key issue as far as the conflict, if you will, between oil and gas drilling and potash mining.

Q. Let's go ahead and take a look at Intrepid Exhibit No. 21.

A. I'll go ahead is describe this exhibit.

Q. Okay.

A. What we see here is a graphic which shows potash mining and how subsidence takes place above it. And I don't think it's hard to understand that when you remove material from the earth, that the overburden, unless it's supported, is going to sink down into that hole. And that motion doesn't take place directly above the hole. In fact, it takes place off at an angle to the side.

And the term sinking earth we selected there to make it a little bit easier to understand. Some people don't grasp what subsidence means. But it's exactly that. The earth is sinking down in the hole that was created underneath it. And I think that it's a very dynamic process and it's a whole lot easier for me to explain it if I just stand up and draw.

Q. Okay. Why don't we do that?

A. If that's all right with you gentleman.

Q. Let's just do a drawing of subsidence.

A. I'm going to draw here. This is the surface of the earth up there and down here we've got a potash zone. For

the purposes of this discussion --

MR. MANGES: Can you see this?

MR. BROOKS: Yes. Of course, I can't see it if somebody is standing between the examiners and the board, but we can see it. Yeah, here.

THE WITNESS: So as we mine -- and I'm going to say we're mining in this direction -- and say we've mined this far and our machine's down here. Of course, we're taking the material out of here on a belt. What happens is we get subsidence, the movement of the earth is downward as this thing starts to sink down. And it doesn't just subside directly above the mine. It actually subsides over at an angle, okay? And this angle in here is called the angle of draw. All right?

So what's important about this is that if you happen to have an oil and gas well bore somewhere in this angle of draw -- let's say it's right here -- what will happen is that well casing could get damaged. Now, there's two very significant cases here: Whether that well is a producing well or is a plugged and abandoned well.

If that well is a producing well, the operator of the well, of course, would like to make sure that the casing remains undamaged because they want to do workover operations and so on, and at some point at the end of the life of that well when it's depleted, they want to go in and plug that well. That's our concern also, because the movement of oil and gas

that takes up through the well bore is going to be stopped when they plug the well and they're going to put a plug down here somewhere beneath the salt layer, so it's going to get plugged down here.

Our other concern as potash miners is that any groundwater that's up here in this zone doesn't leak down into our mine because it'll flood our mine out. There's been more potash mines lost to flooding than to any other cause. Now, not all of them -- or any of them that I know of is well bore caused, but it's certainly a conduit for fresh water from the groundwater or fresher water to get into the mine. And once that flooding starts, it's very hard to stop. So our second concern is that the well bore is undamaged in this area so we can plug the thing off right here. So we've got two areas of concern.

Now, once the well is depleted and properly plugged, then we have a different scenario. Now we're not as concerned about the subsidence breaking or interrupting the mechanical integrity of the well bore, because nobody's planning on getting in and out of it anymore. So we can start with a different scenario.

And by the way, before I move on, this distance between the edge of here and the edge of here, this horizontal distance, which is what we call the safety corridor right in there, that's the distance that's really addressed in R-111-P.

Is that a quarter mile or a half mile? And there has been a study initiated by the Bureau of Land Management to study this issue. They have handed it over to Sandia Labs under contract to study what is that safe distance. Because we're all interested in it -- both industries.

Now, let's go on and look a little bit more what the situation looks like in Section 16 where the Fasken well that's proposed. And here's the surface of the earth and the potash zone. Now we've got a situation where we've got a well bore that's been drilled through here and intercepted a shallow oil/gas pool. It's shallow, relatively low pressure, heavy oil, low gas/oil ratio, high water cut. It's not very deep.

And it's my understanding and from my examination is all the wells that went down to this reservoir have been plugged and abandoned. And that's the whole issue in Section 16 because I believe there's about 18 of these well bores out here that are shallow. So the whole question is can Intrepid, knowing that there's commercially mineable ore in here, come in here and safely mine around this well?

So what happens, we'll go in there and we'll mine, we'll extract and leave a safety pillar around that well bore. Now, keep in mind our assumption at this point is that the well has been properly plugged, and if it hasn't, that we're going to go in and properly plug that well at our expense. It's been plugged here. And it's been plugged up here to stop any

groundwater from coming into our operation. So we've looked at this and come to the conclusion preliminarily that we can mine within about 200 feet of this well bore on either side, recognizing that subsidence is going to take place on both sides. From here subsidence -- it's going to subside on this side, and it more likely than not will damage that well bore if it's in the angle of draw.

But at this point, we've assured ourselves as a mining company, that the well is properly plugged and that we can do that. And the reason that we would leave this 200 feet around here primarily has to do with the fact that we really don't want to crush this well bore right in here.

Another one of the experts in our case will testify as to the reasonableness of that size.

Q. (By Mr. Manges): Let me ask you one question back here on 34, and assuming that this well is an active well and the casing has been damaged by the angle of draw, or moving along that angle of draw, what are the problems with that?

A. Well, first of all, trying to get drilling tools in and out of the hole is going to be impeded. And, of course, it depends to the specific damage of the well bore. It could just as well be egg shape or it could be completely pulled in two. And once that well is damaged, then we can't get inside of it. We're really no longer able to control the flow of fluids in and out of that well.

Q. Okay.

A. So our concern is that somehow one of those fluid flows, then, is going to be work through a fracture or a crack or a plane of weakness. But nevertheless, it's what I would call an uncontrolled situation.

Q. All right. And is there a concern about the ability to plug such a well?

A. Once it's damaged?

Q. Yes. And what's that concern?

A. Well, that you couldn't get tools in and out of the hole, particularly to set this plug right here to isolate the gas reservoir down here on to isolate the water from the groundwater reservoir.

Q. Now, have you had any personal experience in the drilling business where a casing has been damaged by some sort of subsidence or movement?

A. Yes. It's quite common, actually, up in North Dakota up in the Williston Basin where the well bores penetrate salt beds, such as we do in New Mexico, but at a much deeper depth. The casing that's through the salt zone will actually be pinched or damaged just by the movement of the salt.

Q. What happens when that occurs?

A. Well, it depends on the severity of the damage. Sometimes you can go in there with casing rollers and roll it out again, or sledge it out. But absent that, you're down to

smaller and smaller diameter tools. And at some point, the casing can actually be ruptured or you can wear a hole in it right there, at which point the well is plugged and lost.

Q. And from a potash point of view or the mining point of view, what's the consequence of not being able to plug the well?

A. Again, if we're not comfortable as a mining company that this plug has been properly set and there's isolation of natural gas or isolation water up here, then we're much more concerned as a mining company, and we're going to put an appropriate safety distance between that well bore and our miners.

Q. Okay. Let's go to the next exhibit. And as I understood your testimony with respect to these plugged abandoned wells is that it was limited to the shallow old wells that are in Section 16; is that right?

A. That's correct.

Q. Would a deep high pressure gas well present a different issue for Intrepid?

A. Well, again, that is true because the wells that were left behind in the '30s, '40s, '70s and '80s back in Section 16 are at a much lower pressure and have a much lower gas/oil ratio. And the significance of that is even if you would have a leak, that the volume of material that would be coming in, would first of all, be much slower and it would be

of a different nature. A deeper, higher pressure gas well would have much more driving force. It would flow through at a higher rate and, of course, would be predominantly natural gas and that creates an explosion hazard in our mines.

Q. With respect to this whole issue, you mentioned earlier that the BLM and Sandia National Labs are studying this issue. What exactly are they studying?

A. Well, their study is called the gas migration study. And they are studying this very issue of what is the safe distance between an oil and gas well and an open mine working, an active mine.

Q. And in the meanwhile, what approach is Intrepid taking to developing its own internal pillar policy.

A. Well, right now we're abiding by R-111-P for active wells. And for this study here, we're studying it with great caution. We're not going to make a decision on this pillar size until we see the Sandia study come out.

Q. I'd like you to -- who all has been involved in that study, to your knowledge?

A. In our group?

Q. No. In the BLM safety study. And we can look at, if you want to, Exhibit No. 18. And it says, this is titled Potash Gas Migration Project, and the second page is Intra-governmental Order Articles. Do you see that?

A. Yes. Your stamp number is 1173?

Q. 1172 is what I've got -- to 1181. Is this the BLM study that you're speaking of?

A. It is.

Q. And have a variety of different groups, the State, the oil and gas industry, the potash industry, the state and federal government has been invited to participate?

A. Yes, they have. And I believe there's a list of potash industry and oil and gas industries and governmental agencies that have been notified and this project has been widely disseminated for scoping. And I believe that's where it is right now.

MR. MANGES: Okay. I move the admission of Exhibit 18.

MR. FELDEWERT: No objection, Mr. Examiner.

MR. BROOKS: Exhibit 18 is admitted.

[Respondent's Exhibit 18 admitted into evidence.]

Q. (By Mr. Manges): Okay. Let's take a look at the section at issue here, Section 16 in particular, and if you look at Exhibit 14 which is a map. I'd like you to describe that.

MR. FELDEWERT: Exhibit 14?

MR. MANGES: Pardon me. Exhibit 10, Exhibit I-10.

Q. (By Mr. Manges): Okay. What do you have there?

A. This is a mine plan showing how we would approach mining the potash out of Section 16. The potash primarily

occurs in the 10th ore zone, which is the shallowest ore zone in the basin. It's the same ore zone that was being mined by National Potash in 1982 when the mine shut down. And, again, it depicts the existing plugged oil and gas wells.

Q. And how are those depicted. Those are the solid circles with the --

A. Those are black circles with a slash through them, a diagonal slash and a square around them indicating the 400-foot pillar which would be left that we're contemplating leaving around each one of these wells that's been properly plugged.

Q. Okay. What's the width of -- there's a 350-foot barrier protection pillar or haulage way. Do you see that?

A. Yes.

Q. What's the purpose of leaving that pillar?

A. Well, when we develop a mining panel or a mining area in our potash district, what we do is we set up beltways and utilities and passageways and we don't want those utility quarters to subside. We want them to stay open for as long as we need them. So we leave a 350-foot area on each side that supports that passageway, that haulage way.

Q. Is that standard mine practice in Carlsbad potash mining?

A. It is, for this depth of mine; that is correct.

Q. And how old are some of those mines?

A. Our West Mine has been operating continuously since 1932.

Q. And does it use 350-foot protection?

A. We currently use 350-foot pillars at our West Mine in the areas that are this depth. Not all the mines are at this depth, so we don't use the same barrier pillar in all areas.

Q. Okay. And has that proved to be adequate there?

A. It has. It has. It's been deemed to be adequate both by engineering calculation and by practice.

Q. Let me ask you how this proposed mine plan would work. How would the ore body be accessed and developed?

A. Well, as you can see, we would drive entryways around the section, both the east/west, the north side and then we would enter into the ore body. It's a little bit harder to depict dynamically, but as you can see from the direction of the arrows, we drive out into a section and actually retreat from the mine backwards in a chevron patterns. So the chevron patterns would be interrupted in those areas where we leave safety pillars around the plugged wells. Typically we extract about 92 percent of the ore that's in an extraction area.

Q. And you show this being accessed from Section 8; is that right?

A. That's correct.

Q. And is that part of the North Mine workings?

A. It is. What you see in the light gray shadow there is the existing North Mine workings.

Q. And does this appear to you to be a reasonable mine plan for Section 16?

A. It does.

Q. And provide protections for the existing shallow oil plugged and abandoned wells?

A. Yes, it does. And again, I might point out that we are not going to finalize this plan until we do get the BLM safety study in our hands. We want to see what their opinion is. Also you'll notice that show mining around the Laguna 16 State No. 1. And again, the assumption is that well has been depleted and is properly plugged and abandoned.

Q. So if that well were active, then, no mining would be contemplated in the yellow area; is that right?

A. Either in the yellow area or, again, pending the BLM study, we may come to a different conclusion.

MR. MANGES: Okay. I would move the admission of Exhibit 10.

MR. FELDEWERT: No objection.

MR. BROOKS: Exhibit 10 is admitted.

[Respondent's Exhibit 10 admitted into evidence.]

Q. (By Mr. Manges): Now, when you're developing a mine plan for this and you come across a well that has been plugged and abandoned, is it possible for Intrepid to go in and

re-plug it if it feels uncomfortable for whatever reason?

A. Yeah. If we weren't satisfied with the evidence that we found in the record or some area reason we were uncomfortable, we would attempt to wash down and re-plug the well.

Q. I'd like to turn to Exhibit No. 14, and have you describe what Exhibit 14 is.

MR. FELDEWERT: I think for the record, this is the same as Fasken Exhibit 10.

MR. MANGES: It probably is. We need to -- I was trying to save all the confidential stuff for the end here.

MR. FELDEWERT: So I think this has already been --

Q. (By Mr. Manges): Let me ask you a few other questions about the North Mine. Why did National Potash close that mine?

A. Well, in 1982 potash reached the point where it was a very low price. And that was primarily due to the development of the potash reserves up in Saskatchewan. There were quite a number of potash mines that were developed up there in the late '70s. There was basically an overproduction of potash in the world, so potash's prices continued to decline.

The National mine was operating with equipment that was designed back in the 1950s. It was very energy inefficient. And when the high energy prices hit with the low

potash prices, they elected to go ahead and close the mine. And the mine was subsequently sold to Mississippi Chemical.

Q. And under your analysis, are there significant reserves existing in the North Mine?

A. Yes, there are. You know, we've, of course, entered into a whole new era of potash supply and demand and potash prices have increased approximately seven-fold since this mine closed. And so the economics are significantly different than they were in 1982.

We're encouraged to look at the North Mine both because the oil reserves are there. We understand, of course, a great deal about the mineralogy, the thickness, and the grade of the ore body out here due to the extensive geologic knowledge base that was left here by the prior owners, plus our own new information that we brought here.

In addition to that, the National Mine was never completely closed. It still has two 15-foot diameter concrete-lined shafts that are serviceable out there. They are only one mile from this section. In addition to that, all the infrastructure is still in place. We still have power, we still have water, we still have rail service, paved highways. The fact is, we have offices there because this is, as I pointed out earlier, where our storage and rail load-out facilities are.

So we have approximately 100 employees -- not all at

the same time. But they are assigned to the North Mine operations.

Q. And you also have permits which would permit you --

A. Yeah. The mining permits are still active for this mine.

Q. What are your current plans for re-opening the North Mine?

A. Well, we've engaged a company called Tetra Tech to initiate a feasibility study. Primarily what this is, is designing and costing the new surface facilities that would be involved in opening this mine.

Q. I'd like you to turn to Exhibit 15.

MR. MANGES: Mr. Hearing Examiner, we're getting into some confidential information at this point. I'd just like to confirm that everybody in the room, at least at this time, are either company employees or parties. Is there anybody from the press?

MR. BROOKS: It would appears that everyone here is either employed, party, counsel, or the Division.

MR. MANGES: Okay. That is good.

Q. (By Mr. Manges): So we'll go ahead and have you take a look at Exhibit 15.

A. All right.

Q. And describe Exhibit 15 for us.

A. Well, this is basically the scoping of the initial steps to have Tetra Tech come out to our facilities and initiate the actual feasibility study to study all the different issues that would be involved in re-opening the North Mine. And that includes the study of the existing infrastructure and equipment, geological aspects of the project, any permitting issues that would be involved and such things as air quality, groundwater, et cetera. There's a whole list, actually, of items that they're going to study for us.

Q. And have they been retained?

A. They have been, and they have been to the site.

Q. They've been to the site?

A. Yes.

Q. So work has started on the feasibility site?

A. Yes, it has.

MR. MANGES: I move the admission of Exhibit 15. I think we'd like to keep it confidential and under seal. It's dealing with a fairly -- well, a confidential document, a company confidential document.

MR. FELDEWERT: This is the e-mail between Intrepid and Tetra Tech?

MR. MANGES: Yes.

MR. FELDEWERT: I have no objection to the admission of the document. I don't know if it's confidential.

MR. MANGES: So would you agree that it's

confidential? That would simplify this.

MR. FELDEWERT: Well, let me ask you this. Who's Daryl Longwell?

THE WITNESS: Those are all employees of Tetra Tech.

MR. FELDEWERT: Is it your testimony, then, Mr. Harvey, that Daryl Longwell, Mike Kolin, Mike Henderson, Pat Avery, and Katie Keller are employees of Intrepid?

THE WITNESS: No.

MR. MANGES: We can straighten it, though. Pat Avery is an Intrepid employee.

THE WITNESS: Pat Avery is our chief operating officer and president.

MR. FELDEWERT: Let me just real quick: Who is Daryl Longwell?

THE WITNESS: He's with Tetra Tech.

MR. FELDEWERT: Who's Mike Kolin.

THE WITNESS: Also.

MR. FELDEWERT: With Tetra Tech?

THE WITNESS: Yes.

MR. FELDEWERT: And who's Mike Henderson?

THE WITNESS: With Tetra Tech.

MR. FELDEWERT: And then Katie Keller?

THE WITNESS: She's our landman.

MR. FELDEWERT: And then who's Pat Avery?

THE WITNESS: He's our chief operating officer and

president.

MR. FELDEWERT: I have no objection to the admission of the document.

MR. BROOKS: Okay. Exhibit 15 will be admitted and for the time being, it will be admitted under seal.

[Respondent's Exhibit 15 admitted into evidence under seal.]

Q. (By Mr. Manges): Now, how important is Section 16 to Intrepid's plans and feasibility studies with respect to the North Mine?

A. It's part of the logical mining area for the North Mine. It sits at very close proximity to our North Mine facilities in the event we open the North Mine.

Q. You say in close proximity. Let's put a number on it.

A. It's approximately two miles from the shafts in the North Mine.

Q. How close to the actual workings?

A. Well, the actual workings are something in the neighborhood of 200 to 300 feet from the North Mine -- I mean, from Section 16 to the North Mine workings.

Q. Okay. And what other reasons would Section 16 be important to Intrepid?

A. Besides the reserves that are there?

Q. That's right.

A. These reserves are truly very well known because of the quality of the data that we have in this area. There is simply very little doubt to the existence of the potash mineralization in this section.

Q. And do you have an opinion with respect to whether Section 16 is mineable, commercially mineable, even assuming the existence of the old shallow and plugged --

MR. FELDEWERT: I'm going to object to the form of the question. I'm not sure he's testified as to any study of the geology of the area to substantiate that opinion.

MR. BROOKS: Well, if he has an opinion, I think he's entitled to give it. The basis of his opinion can be inquired about on cross-examination.

You may proceed.

Q. (By Mr. Manges): Go ahead and answer.

A. Yes. Based on the extensive geologic information that we have compiled for this area, we do believe that this section remains commercially mineable potash ore, and given the caveat that we successfully make sure that these wells are properly plugged that we can, in fact, mine that ore.

Q. Would you be able to access this section from another mine, even assuming the North Mine shafts were not opened?

A. Yes. It would be accessible from our West Mine. We have other ore reserves that are in this area which are also

accessible from our West Mine. However, it would not be our preference to do that because it's a very long haulage distance and will take a long time for us to get out here.

Q. But it would be possible, then?

A. Yes, it is.

MR. MANGES: Okay. I'd like to move the admission of the two charts -- we've marked them -- and Exhibit 21.

MR. FELDEWERT: Mr. Examiner, I have no objection to the admission of the charts or Exhibit 21.

MR. BROOKS: Which were the charts? What numbers were they?

MR. MANGES: They're 34 and 35.

MR. BROOKS: Okay. Exhibits 21, 34, and 35 are admitted.

[Respondent's Exhibit 21, 34 and 35 admitted into evidence.]

Q. (By Mr. Manges): I'd like to have you take a look at I6.

MR. BROOKS: What was that?

MR. MANGES: Intrepid 6. It's the next map in line.

Q. (By Mr. Manges): What does I-6 indicate?

A. Well, Map 6 shows the Intrepid LMR, life-of-mine reserves, line.

Q. Which line is that? That's the red line?

A. You'll have to forgive me. I'm red and green

colorblind, so I'm just going to tell you it's the one that goes right around the border of Section 16.

Q. Okay.

A. And then the next line in from that is the quarter-mile buffer that would be contemplated under R-111-P -- not contemplated, it's actually in it.

And then the half-mile buffer is actually not on this map because of the -- just the way the geometry worked out.

Q. Okay. And just for the record, the green line would be the quarter-mile buffer, then?

A. That's correct.

Q. Okay. And there is no -- the LMR half-mile buffer is in blue, but there is no blue line?

A. The blue line is not shown on here. It should be. And then the yellow circles that you see on there are half-mile radius circles around the Laguna State No. 1 and the Laguna State No. 2 locations.

MR. FELDEWERT: So my copy on this has one.

Q. (By Mr. Manges): Would it be true that Section 16 is entirely within Intrepid's buffer zone of its LMR?

A. Yes.

Q. Okay. And would it be true that the proposed Laguna 16 State No. 2 well is located within Intrepid's -- within one half mile of Intrepid's buffer zone?

A. Yes.

Q. Within Intrepid's one half-mile buffer zone -- let me restate that.

A. Of the LMR, yes.

Q. This morning and this afternoon we had testimony regarding how oil and gas drilling would be -- could not be accomplished after the potash mining, basically, that it would be impossible. Do you have a view about that proposition?

A. Yes. I think that once potash mining is finished in this area that oil and gas wells could be successfully drilled.

Q. And what is that based on?

A. Well, it's based on just the pure raw mechanics of the situation and my experience as a petroleum engineer and mining engineer.

Q. Okay. And can you explain how that would work?

A. Well, yeah. If I were to pick a location -- again, the assumption here is that underground mining has finished completely, that there's no more people working underground. And I think that's a very important part of it.

If it were up to me, I would select an area where maximum mining extraction had taken place. In one of these panels that's depicted in Section 16, Exhibit I10, in this cross hatch area right here, any place in here where you've actually completely subsided the mine area so it's completely

closed down there. It would be a good place to pick to drill a well. There's actually quite a few areas where you can do this.

Now, if there's no question that you would have to set a casing string somewhere around the top of the mine opening, perhaps the top of the salt, and when you drill into that area that was mined, there's almost no doubt that you would suffer lost circulation. You would have to dry drill ahead without circulation to a distance of several hundred feet and then set another casing string through the mine.

However, the fact that the mine is subsiding and almost completely closed would be to your advantage because it would give you support around that casing string, so you would not have a long unsupported span in there. At that point, you could go ahead and drill on down to another casing point and set another string of pipe. And it might be set at the -- it depends on the depth of the target as to when the next casing string would be set.

Q. And there was some earlier testimony about directional drilling as well. Do you know what your experience -- well, what has been your experience about directional drilling in the potash enclave?

A. The directional drilling that I've done. I haven't done any directional drilling myself in the potash enclave.

Q. Are you aware of any directional drilling that's been done in the enclave?

A. Yes.

Q. And what are you aware of in terms of that?

A. If you look at the oil and gas wells that have been drilled around in the potash enclave -- as I mentioned earlier, it's about 3,300 wells that have been drilled out here -- if we went through the maps, we could probably identify at least half a dozen wells that were directionally drilled. And I'm separating those from the horizontally drilled wells, which are another special case.

Q. Okay. Would there be an alternative way of allowing an oil and gas well to be drilled by leaving a substantial a pillar in a potash mine?

A. It could be, yes, if there was a pillar that you might depict as a drilling island to be used later after potash mining is finished. That can be done.

Q. Let me turn back to the North Mine. Does Intrepid have the financial ability at this time from the perspective of capital to re-open the North Mine?

A. Yes. Unlike the predecessor owner who was literally in bankruptcy at the time we bought these assets, Intrepid is extremely well capitalized. It's been a very successful company to the point where we took the company public in April of this year. We're now traded on the New York

Stock Exchange, symbol IPI. We have no debt in our company and significant cash and a line of credit. So we're very financially capable of opening this mine.

Q. Okay. And, finally, do you have an opinion as to the best way to determine what an appropriate pillar size would be?

A. Well, the first thing I would do, of course, would be to wait for this BLM study to determine what that safe distance is and then I would key off of that.

MR. MANGES: Okay. We will pass the witness.

MR. BROOKS: Okay. Let's take another 10-minute recess. Do you want to ask some additional questions?

MR. MANGES: Well, I did have a confidential question and a confidential exhibit. But since we're here, I kind of overlooked it because I thought there might be people here, but let me go ahead and do that, if I could.

MR. BROOKS: Okay.

MR. MANGES: Thank you.

Q. (By Mr. Manges): Let's turn to Exhibit 16, please. And we would like to keep this exhibit under seal as well. Can you identify Exhibit 16, please.

A. Yes. This is a memo that we found in the Mississippi Potash files. And it's addressed to Mr. Childers, who at the time was with IMC Corporation. And basically, it's kind of a preliminary study of what their opinion would be

about the feasibility of opening up National Potash.

You can see from the date of on it, January 29, 1982, that this was very close, if not right at the time, that National Potash Mine was getting ready to close. And we found this memo quite interesting, actually, in the fact that it depicted at least a range of values of potash mineralization in here -- and I use the word mineralization instead of reserves because if it was reserves, they wouldn't have shut the mine down. Ore by definition has to be commercially mineable.

And in this document, you'll see that they talked about reserve figure of 32 million tons of final product, potash product, that can be produced off the leases at the North Mine.

Q. Is that on Page 1147?

A. That's correct.

Q. All right. And 32 million tons at 14.9 as of '82?

A. That's correct.

Q. What's the significance of this from your company's point of view?

A. Well, actually, if you look at 32 million tons at today's potash prices, you're talking about roughly $16 billion of gross revenue. And given what we think is the range of cost of what it's going to take to re-open this mine, it makes it very, very financially attractive.

Q. What would those costs be? And just a range is fine.

A. Currently we're thinking $200 to $300 million to reactivate the mine.

MR. MANGES: No further questions. Thank you.

MR. BROOKS: Okay. You're passing the witness?

MR. MANGES: I need to move to admit Intrepid 16 as a sealed exhibit.

MR. BROOKS: Mr. Feldewert?

MR. FELDEWERT: I find this interesting. You said you found this in Mississippi Potash's files?

THE WITNESS: That's correct.

MR. FELDEWERT: And this is a memo that was done by AMC?

THE WITNESS: It was done by IMC.

MR. FELDEWERT: Those are two unrelated companies, right?

THE WITNESS: That's correct. At the time National Potash was getting ready to close, it was offered up to sale to the other potash mining companies in the area, which at the time was IMC and Mississippi Chemical. Mississippi Chemical ended up buying the National Potash facility, which is how, in essence, we ended up with it.

MR. FELDEWERT: So this is a document that went back and forth between two unrelated companies?

THE WITNESS: It started with two unrelated companies and ended up in the files of Mississippi Potash.

MR. FELDEWERT: I don't have any objection to the admissibility. I'm not sure why it would qualify as a confidential document, giving that it was authored and sent between two unrelated companies without any confidential stamp on it.

MR. BROOKS: Do you wish to respond to that, Mr. Manges?

MR. MANGES: Sure. This was found in our files. I don't know that it's fair to assume that -- you know, it says interoffice correspondence, actually, between two unrelated companies.

And, you know, from the point of view of Intrepid, we've certainly kept this document strictly confidential because it has such sensitive information. If you're not willing to protect it, we'll withdraw it.

MR. BROOKS: Okay. Now, I didn't listen to the testimony that closely. Who was Mr. Childers?

THE WITNESS: Well, he was a manager for IMC in the Carlsbad mining district at that time.

MR. BROOKS: And who was Mr. Thayer?

THE WITNESS: I don't know.

MR. FELDEWERT: Mr. Examiner, for purposes of this hearing, I have no objection if they want to try to keep this

confidential.

MR. BROOKS: Very good. I will admit it under seal, then.

[Respondent's Exhibit 16 admitted into evidence under seal.]

MR. BROOKS: We will take a recess for -- let's make it 15 minutes this time. Fasken has five hours and two minutes remaining, and Intrepid has five hours and six minutes remaining. We'll stand at recess for 15 minutes.

[Recess taken from 3:02 p.m. to 3:16 p.m., and testimony continued as follows:]

MR. BROOKS: We'll go back on the record. It's 3:15.

CROSS-EXAMINATION

BY MR. FELDEWERT:

Q. Mr. Harvey, I think you testified that you were vice president of the company.

A. Yes.

Q. And you are one of the largest shareholders?

A. Yes.

Q. The largest shareholder?

A. No. Actually, I'm tied for that position.

Q. Okay. And you are the director of the company; is that correct?

A. I'm one of the directors; that's correct.

Q. When you're here today, you're speaking on behalf

of the company, I assume?

A. I assume so, yes.

Q. Okay. Now, you mentioned that you were aware of directional drilling in the potash area.

A. That's right.

Q. Are you aware of any directional drilling in the potash area to the Morrow Formation?

A. Yes, I am.

Q. Okay. Which one is that?

A. And it's over in the area of our HP mine. I believe that that is --

Q. You're looking at Exhibit 1?

A. I am looking for an exhibit that actually has that location on it, so I'm just going to go off my recollection that there is a well somewhere in 20 South, 30 East that is directionally drilled to the Morrow.

Q. 20 South, 30 East?

A. Right.

Q. Do you know who drilled it?

A. No, I don't.

Q. Do you know when it was drilled?

A. No, I don't.

Q. Can you give my me any more of a location than 20 South, 30 East?

A. Not without further maps. I'd have to get a map

that has that level of detail on it.

Q. Is this is the only directional well you're aware of to the Morrow?

A. That's the only one I can cite right now; that's correct.

Q. Do you know what the distance was?

A. No, I don't.

Q. You don't know the angle or anything about the drilling of that well?

A. I do not.

Q. Do you know if it was successful?

A. It's in production.

Q. It's producing?

A. Yes, it is producing.

Q. Now, so you're not aware of any other directional drills to the Morrow other than the one that you think is located somewhere in 20 South, 30 East?

A. That's correct.

Q. And you've never done any directional drilling yourself?

A. Not in this area. I've done extensive directional drilling in other areas.

Q. But not in the potash area?

A. Not in the potash area.

Q. Have you done any directional drilling to the

Morrow?

A. No.

Q. Okay. You mentioned that you thought gas wells could be drilled through areas that had been mined for potash.

A. That's correct.

Q. You said that was based on your experience.

A. Yes. And I think there's abundant -- there will be abundant opportunities to drill through these mined-out areas once mining has ceased underground.

Q. Okay. My question was you said it was based on your experience.

A. Yes. I've actually had the occasion to drill through a mine before.

Q. You have?

A. Yes, a coal mine.

Q. A coal mine? And how did you do it?

A. Well, first off, I'd say we didn't know the mine was there.

Q. So it was an accident?

A. Well, certainly the selection of our service location was not done with full knowledge; let's put it that way.

Q. So if I'm clarifying, you didn't intentionally drill through a coal mine.

A. No, but we did successfully drilled through the

coal mine. We did have to do a procedure which I described earlier, very similar to that, in the fact that once we penetrated the mine and lost circulation, we drilled ahead approximately 50 feet without returns and we set a string of casing through the mine works and cemented the bottom of it. We drilled to the next casing point, set another string of casing, which we did cement to surface and then we continued with our drilling project.

Q. So you were able to deal with this accidental drilling in a coal mine?

A. We did.

Q. Okay. Have you drilled through any other mines?

A. No. That's the only one.

Q. Okay. So in terms of your experience in drilling through mines or areas of subsidence is limited to the one coal mine that you drilled into accidentally?

A. In terms of drilling, that's correct. However, I might mention that we do drill underground in our potash mines. And we also have an additional situation there which adds to my confidence that we'd be able to drill a well after the mining has ceased, and I can explain that to you.

Q. My question was, I was wondering what actual experience you have had drilling through a mined area or an area of subsidence?

A. I think you've heard it.

Q. Okay. All right. Now, do you have Exhibit No. 1 out? Could you get Exhibit No. 1 out?

You mentioned that you identified your active areas, and I just want to clarify. You don't have any active mining in your North Mine area?

A. There is no underground mining taking place at our North Mine area; that's correct.

Q. When you say activity at the North Mine, you're limiting that to surface activity, or as you put it, you've turned it into an office area?

A. No. Actually, it's more than an office area. I believe what I testified is that we do compaction, granulation, storage, rail load-out, and truck load-out at our North Mine area.

Q. So it's a surface operation?

A. That's correct.

Q. Where is your nearest active area?

A. In terms of underground mining would be at our West Mine, and we are currently mining at the south of 20 South, 31 East.

Q. Now, where -- I'm looking at on this map. Where is your West Mine?

A. The West Mine is -- you see the printed words "West Mine northwest of the Township 21 South, 30 East"?

Q. About the middle?

A. You see where it says "West Mine"?

Q. Okay. And how many sections is that from the North Mine?

A. Well, if you look at where the printed "words West Mine" are and you go to the northeast and follow that gray shaded area, you'll see that it goes up into what is Section 34 of 20 South, 31 East. Do you see that gray area in there?

Q. Are you mining in that particular area?

A. Yes. We are mining in that area. And you can see that that is about one and a half miles from the nearest North Mine open workings.

Q. Roughly one, two, three, four, five miles from Section 16?

A. It is roughly -- it's pretty close, yeah.

Q. Okay. So that would be your closest active mining operation?

A. Yes. And then we also have activity at our East Mine. And that East Mine shaft area is in -- I've got to get another map out before I identify where the shafts are in Section 16.

Well, I'll just stay with this one. We're currently mining at our East Mine in Section 9 of 21 South, 31 East.

Q. I see --

A. That's about one, two, three, four, five miles east of Section 16.

Q. So I see the words East Mind. Where would I go to identify your operation?

A. If you go east from the words "East Mine," that's in Section 5.

Q. Okay.

A. Go six, seven, eight, nine -- go to Section 9. That's where our closest activity is at our East Mine.

Q. Okay. All right. You mentioned that you -- where you had initiated some underground core hole programs.

A. That's right.

Q. Could you identify what areas you initiated that program?

A. Yes. In Section 21 South, 30 East and that would be in Section 23 and 24.

Q. So 21 South, 30 East you had some core hole drilling activity?

A. Yes.

Q. And that was for purposes for evaluating the potash?

A. That's correct.

Q. And that's for the purposes of evaluating it for anticipated mining activities?

A. That's right.

Q. Anywhere else?

A. Yes. In terms of coring activity and from the

surface, in 20 South, 31 East, we've got a recently completed core hole. I believe it's in Section 27 of 20 South, 31 East.

Q. And anywhere else?

A. Our geologist, Jim Lewis, will clarify that location.

Q. Okay. But in terms of locations, are you aware of any other location where you have initiated a core hole program?

A. Yes. In 21 South, 31 East we've got some locations. And that is in the east half of the Section -- or east half of the township -- excuse me. And again, I will have to leave it to our chief geologist to give you the exact location.

Q. Anywhere else?

A. Not that I recall right now.

Q. These three townships that you have identified, are there existing -- is there existing core hole data?

A. Many.

Q. Many. So you're tying to update the system.

A. That's correct. We're adding to the existing database.

Q. But you haven't done anything like that for the township in which Section 16 is located?

A. No. We have not done any core drilling in this section -- or township -- excuse me.

Q. Okay.

A. I might mention that township is in the area of the North Mine and is quite densely drilled with core holes. And if you look at I6, you will see those core holes identified on there. Each one of those symbols that looks like --

Q. Mr. Harvey, you can testify later. I'm just -- you've answered my question. Thank you.

Now, this North Mine area has been idle since the early '80s, correct?

A. That's right.

Q. And if I'm understanding it, all of the major components of that mine have been stripped and removed?

A. No.

Q. No?

A. If you can clarify the question, we can --

Q. Well, I thought I saw a statement from your company that said all major components in the North Mine area were removed. Do you recall that?

A. I don't. Could you refresh my memory?

Q. Would you take a look at our Exhibit 25? Actually, I guess this was part of your exhibit at one point. This is that study you were talking about, correct?

MR. MANGES: Can you refer -- what exhibit you are referring to?

MR. FELDEWERT: Fasken Exhibit 25.

MR. MANGES: Fasken's. I'm sorry.

THE WITNESS: I'll have to get a copy of that.

Q. (By Mr. Feldewert): It's in the white notebook. I'd like to direct your attention to Exhibit 25, Mr. Harvey. Is this the e-mail that involved this initial step that you were testifying to earlier; is that correct?

A. Uh-huh.

Q. Is that right?

A. Yes.

Q. And then included with that in this exhibit are the additional documents that were produced to us in connection with that additional step. Do you recognize that?

A. Referring to the general services agreement?

Q. Yes.

MR. MANGES: Could you give me your reference on the document page number?

MR. FELDEWERT: There's a general services agreement that I had documented IP5, and then there's an Exhibit A to that general service agreement, IP 17, correct?

MR. MANGES: I don't have that in my Exhibit 25, so I'm not sure what you're talking about.

THE WITNESS: I don't either.

MR. FELDEWERT: Do you have that exhibit in front of you, Mr. Harvey?

THE WITNESS: The last page on this is IP9.

MR. BROOKS: That's true in my notebook also.

MR. FELDEWERT: Mr. Examiner, may I approach the witness?

MR. BROOKS: You may.

MR. FELDEWERT: Thank you.

Q. (By Mr. Feldewert): Okay, Mr. Harvey, we have in this exhibit, we have your initial e-mail, correct?

A. Uh-huh.

Q. And this came out of your files.

A. Correct.

Q. And then we have the Tetra Tech schedule of charges which came out of your files. And then we have the general services agreement that you reference, that IP5, which is actually a red line agreement.

A. Fair enough.

Q. Has it been signed yet?

A. I'm not aware of it.

Q. You're not aware of it being signed?

A. I don't know one way or the other that it's been signed. It's been done under my general direction.

Q. But you can't tell us whether --

A. I cannot tell you it's been executed. I would say that based on the actions of the contractor, that it has been.

Q. Okay. And the general services agreement goes on

past IP09 and continues to 10, correct?

A. Okay.

Q. 11?

A. Okay.

Q. 12, 13, 14 -- and then we have a blank signature page, right?

A. Uh-huh.

Q. And then attached -- included with that is an Exhibit A that purports to identify at least the scope of the work.

A. All right.

Q. Okay. This came out of your records?

A. As far as I know.

Q. Okay. And then we have an Exhibit A that also came out as part of your records. That's your stamp up in the left-hand side?

A. Right.

Q. And it continues on until IP-19?

A. All right.

MR. FELDEWERT: Okay. Mr. Examiner, I would move into evidence our Exhibit 25 subject to the clarification that I need to get copies made of this exhibit.

MR. BROOKS: You are talking about the existing Exhibit 25 plus --

MR. FELDEWERT: Pages of --

MR. BROOKS: -- the additional pages?

MR. FELDEWERT: It would extend up to IP-19.

MR. MANGES: Can I take a look at it?

MR. FELDEWERT: I think we just walked through this.

MR. MANGES: Well, I didn't see the back of it. This is a confidential document, so we need to submit it under seal. I think the first portion of it was already introduced under seal, but not the last -- let's look.

MR. FELDEWERT: That's fine.

MR. MANGES: Yes. The first two pages were introduced under seal, but nothing beyond that. So I'd like to include the remaining portion.

MR. BROOKS: Okay. Fasken Exhibit 25 will be admitted under seal.

[Applicant's Exhibit 25 admitted into evidence under seal.]

Q. (By Mr. Feldewert): Mr. Harvey, would you do me the favor of reading the sentence that I've highlighted here on IP-17?

A. "The facility was shut down in the early 1980s and the major components were removed."

Q. Okay. Thank you. Now, so this facility has been dormant for over 25 years; is that correct?

A. That's correct.

Q. Now, when you reference North Mine workings,

which I saw in your pre-hearing statement that was filed by your company, what are you talking about?

A. Can you go back and read that over again so I can make sure I understanding what you're talking about?

Q. Well, if you look at our Exhibit 32 --

A. Okay.

Q. -- you see Paragraph 2 of that pre-hearing statement.

A. Uh-huh.

Q. And halfway down it says, Intrepid's North Mine workings are located less than one half mile north of the proposed well." Do you see that?

A. Yes.

Q. What are you talking about when you say your "North Mine workings"?

A. Those mine workings in the context of this document are areas where mining has taken place and potash ore has been extracted.

Q. But there's no current activity?

A. There's no current activity.

Q. Now, with respect to the North Mine, the portion of the North Mine that is in Section 9, in the southerly part of Section 9, can you describe for me what is the nature of that working area, as you call it?

A. Other than it looks to me like they extracted

potash ore out of it. I don't have any other information for you.

Q. Has it been sealed?

A. Not to my knowledge, no.

Q. Is it an open mine? Is it an open area?

A. It is an open area that would be unsealed.

Q. Unsealed, okay. Is there any part of the North Mine that has been sealed? As I look on your Exhibit 1, for example, it shows a large gray area comprising of the North Mine. Is that all completely open or has any of it been sealed?

A. None of it has been sealed, to my knowledge.

Q. Okay. Has any of it been walled off?

A. Not to my knowledge.

Q. Do you have any idea why the North Mine workings stopped in the southern part of Section 9?

A. No. I can speculate on it that it looks like to me they stopped because of the presence of two oil wells there.

Q. You don't have any other understanding as to why they stopped?

A. No, I don't.

Q. Okay. Now, we were looking at this Exhibit 25 which was that e-mail about the initial steps of the feasibility study, okay? All right. Now, this is really a -- well, you clarified it as an initial step your company does,

correct?

A. Yes.

Q. It's just the initial step. Now, is it simply to determine the evaluations that are necessary in order to come up with a draft feasibility study?

A. I would describe the process as follows: We will take an initial look at all the different items that need to be studied. I believe several of them are enumerated in -- I have to pause here a second and ask you: I've looked under 25, and I don't find 25 to be the right exhibit.

Q. This is our Exhibit 25.

A. Thank you.

Q. Is this not, Mr. Harvey, a proposed endeavor to scope the evaluations necessary to complete the draft feasibility study?

A. Would you ask it again?

Q. Would you take a look at IP002, the second page, Paragraph 4?

A. Uh-huh.

Q. Under this proposal, they are to prepare a summary of the information, obtain and assemble a feasibility study team, and prepared a detailed scope of evaluations necessary to complete the draft feasibility study, correct?

A. Yes.

Q. So it's not really a feasibility study. It's a

study to determine what you need.

A. What is needed for the feasibility study.

Q. Okay. All right. And as you noted earlier, you can't testify here today whether you have even signed the agreement to have this initial step undertaken, correct?

A. Well, I didn't sign it, but I don't think Tetra Tech would be out there working unless the work agreement has been signed.

Q. Wouldn't you have signed it?

A. No.

Q. This was produced to us fairly -- within the last couple of weeks. Are you aware of any signing of this red line agreement within the last two weeks?

A. I'm aware that Tetra Tech is on the ground working.

Q. Okay. And this was initiated only after this hearing was initially set for May 1st, correct?

A. I don't think that I would characterize this as being something prompted by this hearing, by any means. I think that you'll find that we've been talking about this North Mind for some time.

Q. I want to get into that in a minute, but in terms of this document, you've presented the earliest exchange of this initial step is May 28th, 2008, correct?

A. That's the date of this e-mail. I'm not sure

when the first correspondence or verbal discussion took place with Tetra Tech, but I think it was sometime in May.

Q. Sometime in May?

A. Sometime in May.

Q. No earlier?

A. I don't think it was any earlier than that.

Q. Okay. And, in fact, didn't you tell potential investors just two months ago that no feasibility study was even contemplated for the North Mine?

A. No, I don't believe so. I believe in our first quarter earnings call we said we were initiating a study of the North Mine.

Q. Okay. Would you take a look at Fasken Exhibit 26, please?

A. All right.

Q. Do you recognize this document, Mr. Harvey?

A. Yes.

Q. This is a prospectus that was issued. It was dated April 21st, 2008, correct?

A. Yes.

Q. All right. And it's a public offering of Intrepid's common stock?

A. Yes.

Q. Now, before your company sends out a document like this, do you run it by your attorneys?

A. Yes.

Q. Do you run it by your management?

A. Yes, we review it.

Q. Do you undertake that it is accurate and up to date?

A. Yes, we do.

Q. Okay. Would you turn to what's been marked as Document 1029?

A. Say again on the number, please.

Q. 1029. Halfway down there, you're informing the public about the North Mine, correct?

A. That's right.

Q. And halfway down, within that paragraph, your company states, "We may choose to reopen the North Mine in the future, although no feasibility study for the project currently contemplated due to management's focus on the HB mine and other projects at our operating facilities."

Do you see that?

A. Yes.

Q. That's what you told your investors two months ago?

A. Actually, this document was first published on December 22nd of 2007.

Q. Okay. But it also went out on April 28, 2008, correct?

A. That's correct.

Q. All right. Now, can you tell us looking at Exhibit 1 where this -- you said your focus here is on the HB mine. Can you show us where that's located?

A. Yes. Look at Exhibit 1. That HB mining project is primarily located in Township 20 South, 30 East.

Q. So that's one full township away from Section 16?

A. More than a township. That's right.

Q. Okay. And when you say in this that your focus is on the HB mine and other projects at your operating facility, are you talking about, then, your East Mine and your West Mine?

A. Yeah. At our Moab facility and our Wendover facility.

Q. Where are they located?

A. In Utah.

Q. Okay. And didn't you tell your investors in this prospectus that any plans for the North Mine are at the very early stage?

A. I think the document speaks for itself.

Q. And didn't you tell your investors less than two months ago that you may not actually proceed with any of your plans for the North Mine?

A. Are you referring to this S1 document?

Q. I'm referring to your prospectus, yes.

A. Yes.

Q. That was sent out in April of 2008.

A. That's what it says.

Q. And in this prospectus, you identified for your investors a five-year operating plan for the company, correct?

A. That's correct.

Q. And you actually put together for your investors your strategy for the foreseeable future, did you not?

A. That's right.

Q. And what did you tell them?

A. Well, it actually takes quite a bit of time to talk about all the things we've talked about to our investors. Perhaps you could be more specific.

Q. Okay. Let's do that. Did you not tell them that your focus would be on increasing production at your existing facilities and to re-open the HB mine?

A. That's right.

Q. And okay. And is it true, Mr. Harvey, that the North Mine was not even discussed as part of your foreseeable five-year operating plan?

A. No. I wouldn't say that's true at all. I think the document, again, clearly states that the North Mine is a development asset.

Q. Would you take a look at Page 134? Do you see in the middle is says, "Our Strategy"?

A. Uh-huh.

Q. Now, you're telling your investors what your strategy is, correct?

A. I'm aware of that.

Q. And what your plans are.

A. Absolutely.

Q. And you want to fully disclose what your plans are in an accurate manner, right?

A. Yes.

Q. All right. And what you tell your investors here, do you not, is that over your five-year operating plan is to extend potash production from existing facilities.

A. That's right.

Q. And you list the West Mine?

A. Uh-huh.

Q. You list the East Mine?

A. Uh-huh.

Q. You list the Moab Mine?

A. Uh-huh.

Q. And you list the Wendover facility?

A. Uh-huh.

Q. You don't list the North Mine.

A. That's right. On this document.

Q. And then you tell your investors two months ago that your focus is going to be to re-open the HB mine as a

solution mine?

A. That's correct.

Q. And then you go to the next page, and you have a long explanation about that. But nowhere do you even mention the North Mine as being within your strategy, correct?

A. Not in this document.

Q. Well, this is what you expect your investors to rely upon?

A. Well, I expect them to rely on our most recent filings.

Q. Okay. And this was two months ago?

A. Yeah.

Q. Okay. All right. Is there one more resent than this?

A. Yes, there is. A quarterly earnings report.

Q. Okay. That hasn't been produced to us. And I think what you told your investors here is the best you could say that you may choose to re-open this North Mine at some unknown time in the future.

A. Uh-huh.

Q. Is that correct?

A. That's correct.

Q. Now, and what's -- I want to make sure this is clear. You first have to re-open the North Mine before you would even consider mining in Section 16.

A. No, that's not true.

Q. It's not?

A. No. We can access Section 16 from our West Mine also.

Q. Didn't you testify you didn't plan on doing that?

A. No. I said that we didn't plan on doing that. The main reason we don't have Section 16 in our mine plan right now is because we don't have a potash lease.

Q. Okay. Let's talk about your mining plans. Would you turn to Exhibit 28?

A. Yours or ours?

Q. Let me ask you this: Mr. Harvey, were you aware of a subpoena being issued to your company in this case?

A. I was aware of it.

Q. Were you aware that it asked for mining plans that you had submitted to the BLM or any federal or state agency?

A. I believe that's true, yes.

Q. Okay. And did you produce to us all of your filed mining plans?

A. I believe we did.

Q. Now, I'm going to represent to you that one of the things that we received was what has been marked as Fasken Exhibit No. 10.

MR. BROOKS: Ten you said?

MR. FELDEWERT: Ten.

Q. (By Mr. Feldewert): Do you have that in front of you?

A. I do.

Q. Do you see that it's filed mining plans for January of '06, January of '07, and January of '08?

A. Yes.

Q. These are official plans that you filed with --

A. The Bureau of Land Management.

Q. And on these maps are you supposed to accurately depict to the Bureau of Land Management what you see as your foreseeable mining plan?

A. That's the plan at the time, that's right.

Q. Now, there have been no other filed mining plans produced to us. Is that because you don't have other filed mining plans?

MR. MANGES: Objection. I think the parties agreed to limit this to the North Mine. There are other plans that pertain to other mines.

Q. (By Mr. Feldewert): Okay. But in terms of plans that depict the North Mine, this is all that you have?

A. That's right. With the Bureau of Land Management, that's all we've filed.

Q. Okay. Where are the -- did you get Mississippi Potash's records?

A. When we bought the assets?

Q. Yeah. When you bought the assets.

A. Yes, we did.

Q. Were there not any filed mining plans within those records?

A. I did not examine all those records.

MR. MANGES: I'll object to that. I think the parties have also limited the scope of production for the mining plans. I'll get that order, if you want. But I don't think -- I know that it was not unlimited at the time.

MR. FELDEWERT: We can debate, but the order did not limit the mining plans in this area to any particular period of time.

Q. (By Mr. Feldewert): But I'm just wondering if there's any other filed mining plans other than what you produced.

A. Not that I'm aware of.

Q. Okay. All right. Can you explain to me what you're showing here. It's kind of hard to read, but what do the colors mean?

A. Well, the colors typically depict the sequence of mining events.

Q. And I'm looking now at the January '06 file by Intrepid.

A. And the January '06 filing by Intrepid does not

have the color coding accurately depicted on it. You can see on the lower left-hand corner where it as says the words "hatching legend," and then where it says "2007" and "2008."

Q. It looks like there's supposed to be something in yellow in 2006.

A. Yeah. You're right.

Q. Okay.

A. The next page shows it more clearly, 2007 and 2008, 2009.

Q. And that's the one that was filed in January of '07?

A. That's right. And then the next one is filed in January of '08.

Q. And that's your most recent filing?

A. That's the most recent one, yeah.

Q. Now, what do the colors depict here? Let's just use January 2008, okay? And it shows some purple down in the left portion. That is your West Mine?

A. That's right.

Q. And you project some mining there in 2010?

A. Uh-huh.

Q. And then if I go to your -- down in the lower right-hand corner, is that your East Mine?

A. Yes.

Q. And you don't project any mining there in 2010?

A. Not on this plan.

Q. Okay. And the only purple I see is down there at your West Mine?

A. That's right.

Q. And, in fact, before -- in January of '08, what you told the BLM is that only thing you anticipate in the North Mine -- is that a little sliver up there? Do you see this little sliver up there? What does that mean?

A. Well, the plan at the time was that we were going to go ahead and open up the north shafts, do some exploratory mining underground, put a team down there to assess the condition of the open mine workings and see what work it would take to open up some new panels down there.

Q. In the north of the North Mine?

A. That's right.

Q. Up around -- on this map, it would be Section 4?

A. Right.

Q. Would you then move into Section 4?

A. Well, it depends on what we would find.

Q. What did you find?

A. We don't know. We haven't been up there yet.

Q. You haven't been up there yet. So would that be your initial focus.

A. That would be our initial approach to looking at the underground workings up there, that's right.

Q. What you're telling the BLM is that at least over the foreseeable future, the only planned activity you have for the North Mine is to take a look at possibly re-opening the shafts up in the northern part of the mine, correct?

A. The workings, yes. Go ahead and reactivate the shafts and keep in mind that the shafts are not there.

Q. And then expand in Section 4.

A. And then go on up into Section 4 and do some exploratory mining, that's right.

Q. No plans for Section 16?

A. No.

Q. No plans for Section 17?

A. We don't own the potash lease in Section 16.

Q. Now, you do own it in 17.

A. It could be.

Q. Do you or don't you?

A. That was not the plan.

Q. All right. But you do own the least in Section 17?

A. Fair enough.

Q. All right. And you don't have any plan there?

A. Not that's depicted here.

Q. And you own the lease in Section 20 and there's no plan there. You own the lease in 29.

A. That's right.

Q. No plan there either?

A. No plan there.

Q. Okay. And we could say the same thing about 8, 9, and 10. No plans whatsoever?

A. That's right.

Q. In fact, what this shows -- and you tell me if I'm wrong -- is that your primary focus in terms of your development activities, at least what you've told the BLM, is that's it's going to be down in the West Mine and East Mine area, which is a number of miles to the south of the North Mine.

A. Yeah. Well, you know, we've got a mine plan that goes out 25 years in this area -- at least 25 years.

Q. I haven't seen one. Why was that not produced?

A. Well, because it doesn't pertain to what we agreed to supply for a mine plan. And it's part of our reserve report.

Q. Well, I don't -- Mr. Harvey, I'm not sure what you think we agreed to, but the subpoena was to produce all of your mining plans. Are you telling me that has not been done?

A. My understanding was it was limited to the nine sections around Section 16.

Q. Okay. And are you saying you have a 25 year mining plan that shows anything other than what is shown on here for the nine sections around Section 16?

A. There's no mining plans in Section 16 on the mine plan I'm referring to.

Q. On the 25-year plan?

A. On the 25-year plan. We don't own that potash lease. It's not in that mine plan.

Q. All right, then, in your 25-year mine plan, is there any mining plan for Section 17 in which you do own the lease?

A. I'd have to look at it.

Q. Are you aware of any?

A. I don't have it memorized.

Q. Are you aware of any?

A. I'm not aware of any.

Q. If there was, you would have produced it to us, would you not?

A. I believe we would have.

Q. And the same would hold true for Sections 8, 9, 10, and 20?

A. Correct.

Q. I want to look at -- Joe, what's the exhibit that has your Section 16? What's that number?

MR. MANGES: The mine plan?

MR. WARNELL: Is that I-10?

Q. (By Mr. Feldewert): Okay. Now, this Exhibit 10 that you've brought out here today, do you know when this was

created?

A. It's dated June 20th.

Q. Okay.

A. And I believe that's when it was created.

Q. So it was created for the purposes of this hearing, was it not?

A. It was.

Q. Has Intrepid previously tried to mine any area like Section 16 where you had 19 existing well bores?

A. No.

Q. Now, you show on your plan that you are going to be able to mine right up next to the Laguna State 16 No. 1, right?

A. Yes. And, again, the assumption on this plan is that the Laguna 16 State No. 1 has been properly plugged and abandoned.

Q. Okay. So if this well is accepted by the Division and Fasken properly plugs the Laguna 16 Well No. 2, you'll be able to mine up next to that one as well, under your projections, correct?

A. That's under the projections and under the assumption, of course, that the timing works out.

Q. Why did you -- I had a question here. In your mine plan here, you see how your shaft goes through Section 8 and then jaunts over to Section 16?

A. Yes.

Q. Why wouldn't you just extend out to Section 9?

A. That's because the engineer that prepared this took the route that they felt was most likely to be open. And because of the uncertainty of the condition of the workings in Section 9, he elected to come out of Section 8. Section 8 has significant barrier pillars in it and it does not have much extraction. So given that the time period has passed and someone was underground, he elected to show the heading coming out of Section 8.

Q. I don't understand that. You said you had some concerns about the conditions of the mine?

A. Yeah. Again, the assumption was safer that the conditions are correct -- are amenable to mining in Section 8, whereas in Section 9 it was less certain.

Q. What's the problem with the south part of the mine in Section 9?

A. I'm sorry. What's the problem?

Q. What's the concerns about the south part of the mine?

A. Well, we're not as certain about the conditions of the underground workings in Section 9.

Q. What aspects are you not certain of?

A. The amount of subsidence that might have taken place.

Q. So are you saying that there has been subsidence in the southern part of your mine in Section 9?

A. I'm saying we're not sure how much subsidence has taken place there.

Q. You know there has been some?

A. I would say that "some" is different than "significant." We don't know how much has taken place there.

Q. All right. Let's step back. You know there's been subsidence.

A. But we don't know how much.

Q. Okay. Any other concerns with the southern part of your mine in Section 9?

A. Not that I'm aware of.

Q. And I think you testified that this plan assumes that these existing well bores are properly plugged and abandoned?

A. Yes.

Q. What is the criteria for wells to be properly plugged and abandoned?

A. There's really a couple. One, we have to be convinced that there's not going to be any leakage from the oil and gas reservoir or the overlying aquifer via the well bore into the mine.

Q. Okay. So how would you -- what conditions would you impose, then, to insure that's not going to occur?

A. Well, I would make sure that there is a proper cement plug -- and I'm going to refer to this exhibit here -- that's set below the salt interval here and that there's a proper cement plug that's set in the well bore above the salt at this location here.

Q. What do you consider to be a proper cement plug?

A. Well, at a minimum -- at a bare minimum, we would want a 50-foot cement plug. Above -- below the salt. And above the salt, at a minimum, we would attempt to cement from the top of salt to surface.

Q. Any other conditions of a proper cement plug?

A. No.

Q. Okay. What other conditions would you need for a properly plugged and abandoned well before you could mine as depicted in Exhibit No. 10?

A. Referring to the well bore itself?

Q. Well, whatever conditions you need.

A. Well, beyond the well bore. Well, certainly in terms of the size of this pillar, we're not going --

Q. Let me back up. You're right. I mean just the well bore itself.

A. Just the well bore itself, okay. No. That's it. As long as we're convinced that those two areas are plugged off.

Q. Then you're okay?

A. Then we're okay.

Q. Does that apply across the board? That's not unique to Section 16, is it?

A. I'm just going to limit it to Section 16 for now.

Q. Well, my question is: Does it apply across the board?

A. It applies to shallow oil wells that are in Section 16.

Q. Do you have a different criteria for oil and gas wells, for deeper wells?

A. We might.

Q. We might?

A. It depends on who the operator was, the condition at completion, the point of depletion that the well bore is at.

Q. Don't you have all of those conditions for your --

A. Well, I've studied them in Section 16, but I haven't studied them across the basin.

Q. So you can't tell me today what plugging conditions you would need for the Laguna No. 1 before you could mine as you depict here on Exhibit 10?

A. That's right. I don't.

Q. You don't know. What about the Nearburg well that's a deep well?

A. Until we've had an opportunity to study this

thoroughly, until we get the results from the Sandia Lab study, all that would go into the pot in determining what this final pillar size is going to look like.

However, the well bore itself I would say at this point, I'm confident on these shallow wells -- and I would include the Nearburg well -- that if we have those plugs properly set, that we'd be satisfied.

Q. Now you mentioned that you had examined the wells in Section 16. What did you examine?

A. Basically the depth of the well, the plugging date, and I briefly examined the spreadsheets which your expert put together.

Q. Is that it?

A. That's -- I've looked at some. I've looked at about four of the OCD records in here of these 16 wells.

Q. Four of them?

A. Four of them. I got those last night.

Q. So just recently?

A. Just recently.

Q. Okay. All right. So your examination is just starting.

A. It's just starting.

Q. And you haven't drawn any conclusions yet?

A. The only conclusions I've drawn is that, as represented, all these are shallow oil wells out of the Yates

Formation. Some of them produced, some of them didn't, the age of the wells, the casing sizes, the hole sizes -- that's about it.

Q. But you haven't determined if they have the plugs that you deem necessary --

A. Not in every well, nope. I sure have not.

Q. -- on Exhibit 34.

A. And the conclusion that I have come to is that some of these wells that we don't know anything about, if there are any, we may have to go in and re-plug them.

Q. Okay. But right now you're focused on other areas, other development projects, correct?

MR. MANGES: Objection. That misstates his testimony.

MR. BROOKS: Overruled.

THE WITNESS: Right now -- I'm sorry. Right now, as I sit here today, I'm focused on this.

Q. (By Mr. Feldewert): Are you concerned at all about potential well bore deviation in these older wells?

A. When you say "concerned," would you give a little more detail on that?

Q. Does it raise any concern for you?

A. Yeah. Well bore deviation is something we need to take into account when we develop a mine plan for this section.

Q. Have you taken that into account?

A. Not yet. Only from the standpoint that we understand what the dip angle is in this area, generally speaking, and well bore deviation tends to be a function of dip angle.

Q. But that's something -- in terms of well bore deviation and whether it exists in this section for these older wells, you haven't looked at it yet?

A. No, but we've contemplated what it might be in a range of values.

Q. Okay. Would it affect your proposed plans if these wells produced any sour gas?

A. Yes.

Q. What affect would it have?

A. Well, we would have to take a much closer look at the condition of the casing and we would have to make sure that during our mine plan for this area that we were aware of the fact that there was potential sour gas.

Q. Okay. I want you to assume for me that one of these wells produced sour gas for a period of time. What would you do? If you were going to mine around it.

A. Well, we would do the same plugging program and then when our miners are down there. We would make sure they had a monitoring system in place to check for sour gas.

Q. So is it your testimony that if these wells

produce sour gas, that you will send your miners down there if you put these plugs in place?

A. I'm saying that if the wells are properly plugged, even if there's sour gas down there, we would mine it, yes.

Q. And you've defined for me what properly plugged is?

A. Yes.

Q. It wouldn't be any different if these wells produced sour gas?

A. I don't believe it would, no.

Q. Are you willing, Mr. Harvey, to state today that it's safe for your miners to go within 200 feet of the well bores in Section 16?

A. No.

Q. So if you had to make a decision today about whether to mine in this area, wouldn't it be more prudent to apply your quarter mile rule of thumb safety pillar rather than guessing how close you can get?

A. Well, I think the most prudent thing for us to do is wait for the results from the Sandia Lab study. Because that's based on science, not on the quarter mile, half-mile rule.

Q. Are you saying that the quarter mile and half-mile rule of thumb is not based on any science?

A. That's my understanding.
Q. It's not based on any science?
A. My understanding is that it's not based on any science.
Q. What's it based on?
A. I wasn't here at the time R-111-P was instigated.
Q. You think R-111-P should now be changed?
A. I think that R-111-P should be reviewed.
Q. Including the quarter half and half-mile rule of thumb safety pillars that we have dealt with up until now?
A. Yes.
Q. Even with the subsidence concerns that you've expressed?
A. I think that it's a one-size-fits-all regulation and geologic conditions across this basin vary widely. One size does not fit all here.
Q. Okay. When you told your investors two months ago about the limitations on mining as a result of these safety pillars, didn't you tell them that those safety pillars applied whether the well was active or inactive?
MR. MANGES: Object to the form of the question.
MR. BROOKS: On what grounds?
MR. MANGES: I think the question is directed to the S1 and the S1 is Intrepid as a company. What Mr. Feldewert was asking was kind of a personal question of this witness

personally.

MR. BROOKS: I believe the witness said he spoke for the company. I'll overrule the objection.

Q. (By Mr. Feldewert): My question is --

A. I can't refer to the --

Q. My question is: Didn't you tell your investors two months ago that these quarter mile or half-mile rule of thumb pillars applied whether you had an active or an inactive well?

A. I'm going to have to refer to the S1 here and see what it says. I don't want to answer out of context here.

Q. What have you generally told the public up until now? Haven't you generally told the public up until now that this quarter mile and half-mile safety pillars apply whether you have an active or inactive well?

A. I just don't know now to answer that question.

Q. You can't say yes or no?

A. I can't say yes or no.

Q. You don't want to say yes or no?

A. No. I just need to find out where you can direct me to see what's in our S1, because I believe that's what you're looking at, and I think it's fair that I get to look at it.

Q. Why don't you take a look at 962.

A. Intrepid or Fasken.

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Q. Fasken Exhibit 26. And I'm on Page 962, and I'm looking at the middle of the paragraph. Do you see under "Existing and Further Oil and Gas Development in the Potash Area"? Do you see that reading, Mr. Harvey? And then you go down and you see the words that say "drilling that does not immediately affect" --

A. It says -- and I believe it says "may" limit our ability.

Q. Why don't you read that sentence out loud.

A. "Drilling that does not immediately affect our current operations may limit our ability to mine potash reserves or deposits in the future because safety considerations require that mining operations not be conducted close to a well even if the well is inactive."

Q. Even if the well is inactive?

A. I think inactive is a different word than plugged and abandoned.

Q. I see. Why don't you read the next sentence.

A. "As a result, we will be unable to mine potash located within the appropriate safety pillar around an oil or gas well."

Q. Are you aware of any appropriate safety pillar other than the quarter mile or half-mile provisions in the R-111-P?

A. I think that's what we're exploring and trying to

find out. I think that's what Sandia Labs is helping us answer.

Q. But when you say "safety pillar" here --

A. I believe we've talked about that.

Q. -- aren't you referring to what the BLM requires?

A. No. I believe a safety pillar is what I've talked about on these exhibits right here.

Q. That's what you believe you said in this prospectus to your investors two months ago.

A. I believe that's correct.

Q. Are you telling me that your were referring to this 200-foot safety pillar?

A. I think we were referring to an appropriate safety pillar.

Q. Okay. But not necessarily a 200-foot safety pillar?

A. I believe it refers to an appropriate safety pillar.

Q. My question to you then, are you aware of any other defined safety pillar, either by the BLM or by the Oil Conservation Division, other than the quarter mile and half-mile radius that's in R-111-P?

A. The only other safety pillar -- and it's not, I believe, defined that way -- is in the Secretarial Order of 1986, and it contemplates a drilling island that is one mile.

Q. You said that's not a safety pillar?

A. Well, I don't believe -- my recollection is that's the way it's defined. They talk about a drilling island and the size of the drilling island implies that's a safe distance.

Q. But you're not aware of anything else?

A. Not in New Mexico, no.

Q. Okay. As part of this study, you keep talking about, isn't part of this study to also update how you measure recoverable potash reserves?

A. No. I believe that the gas migration study is not the same study that you are referring to.

Q. Well, maybe you and I are getting our terms mixed up. You're aware of a gas migration study going on?

A. Right.

Q. Are you also not aware of a study that's being conducted to determine how you measure recoverable -- commercially recoverable potash reserves?

A. There's two other studies that you could be referring to. One is the Mineral Classification Board. Is that the one you're referring to?

Q. I don't know. You tell me. What are you aware of in terms of studies?

A. Well, it's your question. Why don't you go ahead and clarify it.

Q. Are you aware of any other studies affecting the potash area other than the gas migration study?

A. Yes. I'm aware of one study that involves the use of electric logs for the determination and definition of mineable ore reserves or measured ore reserves.

Q. Okay. And what's the purpose of that study?

A. Well, I don't have a copy in front of me. However, the purpose of the study is to determine whether or not the use of electric logs are suitable for determining measured ore reserves under the 1986 definitions which protect ore in the Secretary's potash area.

Q. Presently the BLM does not recognize electric logs as being suitable?

A. That's correct.

Q. And when you talk about electric logs, you're talking about gamma ray logs, things of that nature?

A. Yes. The full suite of logs, right.

Q. What do they call that? Geophysical?

A. That's one term that's used, geophysical logs.

Q. Okay.

MR. MANGES: Mr. Hearing Examiner, we have one more witness that won't be available next week. So I think we're running into scheduling problems here.

How much longer are you going to be, Mike?

MR. BROOKS: I would ask the same question. How long

do you expect your cross to continue?

MR. FELDEWERT: Not very long.

MR. BROOKS: Okay. Go ahead.

Q. (By Mr. Feldewert): Are you aware of any other study?

A. No.

Q. Has your company used geophysical logs to estimate the recoverable potash reserves in this area?

A. Can you define which area you're talking about?

Q. This nine section area?

A. Yes.

Q. You have? So you've used data that is not recognized as valid by the BLM?

MR. MANGES: Object to the form.

MR. BROOKS: Overruled. You can answer the question.

THE WITNESS: Sure. We used all the available information -- core hole, channel samples, geophysical data.

Q. (By Mr. Feldewert): Okay. And the geophysical data is not recognized valid by the BLM?

A. That's correct.

Q. This Sandia study that you talked about that's going on in terms of this distance, they may conclude that you don't need a half mile for an active gas well, could it not?

A. Would you ask the question again? You don't need to restate it, I just didn't hear all your words.

Q. It's probably not a very good question. There is this Sandia study going on that is examining how close the potash mining and the oil and gas drilling activity can occur, correct?

A. Correct.

Q. All right. And so it's possible that as a result of that Sandia study, it would demonstrate that you don't need a half-mile pillar for an active well, isn't that --

MR. MANGES: He's asking speculation. Object to form. Let's -- the study, obviously, hasn't been completed.

MR. BROOKS: I'll overrule the objection.

THE WITNESS: Yeah, it could be.

Q. (By Mr. Feldewert): So it can work both ways?

A. It could work both ways.

Q. Would you turn back -- let me step back.

MR. FELDEWERT: Mr. Examiner, before I forget, I would like to move into evidence Fasken Exhibit 26, which is that prospectus that we have been talking about.

MR. MANGES: No objection.

MR. BROOKS: Fasken Exhibit 26 is admitted.

[Applicant's Exhibit 26 admitted into evidence.]

MR. FELDEWERT: And I would also move the admission of Fasken Exhibit 25, which is the e-mail that has been part of their exhibit, plus the additional pages that we walked through that --

MR. BROOKS: I thought we had already admitted that exhibit.

Q. (By Mr. Feldewert): Would you turn back to Fasken Exhibit 26 for me, please? This is your prospectus?

A. Yes.

Q. All right. Now, at the time that you purchased this North Mine from -- out of bankruptcy from Mississippi Potash, you didn't allocate any value at all to the mineral properties of the North Mine, did you?

A. That's correct.

Q. And that's what you told your investors?

A. That's correct.

Q. You told your investors that in 2004 when you acquired this asset, you didn't even expect that North Mine to re-open?

A. Go ahead.

Q. Correct?

A. I think we said in here that it's a development asset, but we weren't currently studying it. I think we cleared that up already.

Q. Okay. At this time, the potash prices were what -- between $100 and $200 a ton? And what were the prices in '04?

A. Which date are you referring to?

Q. Back in 2004 when you acquired the property and

didn't assign any value to the North Mine.

A. Potash prices were about $85.

Q. In 2004?

A. Yes.

Q. So if these potash prices fall back to their levels that they were in 2004, I assume you would come to the same conclusion, that you're not going to look at opening the North Mine.

A. Well, I guess it would be circumstance-specific. I think if the North Mine were operating already at the time the price goes back down, we would continue to operate it. Our West Mine is very similar in size and economics and was operating in 2004 when we bought it and making money at $85 a ton potash.

Q. Now, as part of this prospectus, you had to summarize for your investors and for the SEC your proven and probable reserves, correct?

A. That's correct.

Q. And that was determined with the help of an independent auditor?

A. That's right.

Q. And you provided that auditor your mining plans, your geologic data, your financial data -- did you give them all your data on the area?

A. We did.

Q. Okay. And didn't you tell the public two months ago that your commercially recoverable reserves were limited to the area near your HB mine and your West Mine and your East Mine?

A. I think they were not limited to the area near to, but they were going to be accessed by those mines.

Q. But you didn't tell the public two months ago that your commercially recoverable reserves included any area around the North Mine, particularly Section 16?

A. It did not include Section 16; that's correct.

Q. It didn't include any area around the North Mine?

A. It did include some areas to the west of the North Mine.

Q. Okay. But not Section 17?

A. No.

Q. Not Section 20?

A. No.

Q. Not the sections surrounding Section 16 --

A. That's correct.

Q. -- where you have potash leases?

A. That's right.

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

MR. BROOKS: Very good.

EXAMINATION

BY MR. BROOKS:

Q. Mr. Harvey, this subsidence process that you described, it's not instantaneous, is it?

A. I can describe to you approximately the time period it takes place in. It varies.

Q. That's what I was interested in.

A. Well, okay. When we go into a -- and I'm going to refer to this exhibit where we contemplate mining Section 16.

Q. Yes. That's Exhibit 10?

A. That's Exhibit 10. And the hatch areas here where we're extracting 90-plus percent of the material out of there, that subsidence starts within a matter of hours. In fact, when we're retreating out of these panels, we don't allow our miners to go back into the mined area after 24 hours. And the convergence takes place very, very quickly.

In fact, in those areas where we have two ore zones, for instance, over in our West Mine where we have 5th and 7th ore zones stacked on top of each other, we will go in and we will mine the lower ore zone, allow subsidence to occur, and then 18 months later will come in and mine the upper ore zone. There's only 12 feet of solids that separate those two ore zones. So that how completely it takes place in 18 months.

In other areas where we put in barrier support

pillars, we've been operating out of the same heading for decades and decades. So it depends on how much support is left in there as to how fast convergence takes place.

Q. Wouldn't it depend, also, on what the overlying strata consists of?

A. Overlying strata and the dept of mine are all factors.

Q. Also, wouldn't it be true -- I'm just speculating -- the subsidence into the mine there might be a time lag between the subsidence of material into the mine and the caving further up in the strata as you illustrated in your diagram; is that not true?

A. That's correct. And you're referring to this area up in here?

Q. Yes.

A. I'm not sure that I can testify as to what that term period is, but I would say a period of two, three years would probably be typical for what it would take for this area to completely stabilize after mining ceases.

Q. But you're not really sure of that?

A. I'm not really sure. I haven't actually done a study or gone out and measured it.

Q. And if you were going to attempt to drill an oil and gas well through abandoned mine workings in the manner you had suggested, you want to satisfy yourself that a sufficient

period of time had elapsed to enable the overburden to have stabilized?

A. Correct.

Q. What depth is the potash encountered in this area?

A. Section 16 here it's a depth of 1,700 feet to the 10th ore zone, and that's the shallowest ore zone in here.

Q. Is this above the salt section?

A. It's about 600 feet into the salt section.

Q. Okay. So the potash is actually encountered in the sale section?

A. That's right. There's a layer of salt in here that runs from a depth of around 900 feet to around 2,300. Six hundred feet over the top of the salt is where you find the potash.

Q. I guess that makes sense, because potash ore is a salt, is it not?

A. That's correct. It's laid down as an evaporate deposit.

Q. Okay. The salt sections tend to be fairly unstable, don't they?

A. They tend to be fairly stable?

Q. I said unstable.

A. No. The salt sections, actually, are quite stable, very stable. And their rock mechanics properties are

actually quite predictable, which is one of the reasons why potash mining takes place so successfully out here with such high extraction ratios. We have a very good safety record. We have very few problems with roof falls and such things.

Q. And that would be as long as it's dry, right?

A. Well, I guess when you say "dry," I'm not sure exactly what you're contemplating there.

Q. Well, salts are very soluble, are they not?

A. Salts are soluble, yes.

Q. If they get water into a salt formation, it would wash out, would it not?

A. Yeah. Of course, it depends on the volume. When we have -- of course, we have ventilation systems in our mine and when we have humid weather and we get moist air that comes down the shaft, sometimes you'll see some brine accumulation on the side of the face and the walls in the mine down there. And then as the weather dries up, that will go away.

But the other part about the solubility that's important, of course, is that if we have any sort of a breech to the overlying aquifer, then once that water starts coming in -- assuming that it's fresh water, or even brackish water -- it will start to dissolve out a hole very quickly in the mine.

Q. Okay. But you testified that you could re-plug the plugged and abandoned wells?

A. Well, I said we certainly would attempt to if

there was any doubt that they were properly -- if they were not properly plugged. If we had any doubt about it, we would properly plug them. If you wouldn't mind indulging me, I want to point out one other important factor here.

Q. Sure.

A. And if you look at our Exhibit No. 2 that shows the wells in this section --

Q. Okay. Let me find where that is.

MR. FELDEWERT: Let me -- I don't think this exhibit has been admitted. In fact, it was withdrawn because it did not show the wells accurately in the area, as I recall, Mr. Examiner.

MR. BROOKS: I believe that --

THE WITNESS: Well, we can certainly go back to Exhibit 10, then.

MR. BROOKS: -- there was indication that one of the wells were --

THE WITNESS: Anyway, what you'll notice is that there is a well symbol on here that represents core holes.

Q. (By Mr. Brooks): Yes.

A. Those are wells, obviously, where mining companies have gone down and drilled down to core the potash zones. And then we go back at the finish off the coring and we plug those wells.

Q. Right.

A. And there's 1,200 of these in the potash area. And I would say that hundreds of them have been mined out. There's examples of it right here on this map where core holes have been mined out. Those wells have been successfully plugged and don't allow water from the overlying aquifer to flood into the mine.

MR. BROOKS: Okay. I believe that is all that I have. Mr. Warnell?

MR. WARNELL: Yes, thank you.

EXAMINATION

BY MR. WARNELL:

Q. Mr. Harvey, can you tell me where the North Mine ends and the East Mine begins or vice versa? When I look at all these different maps -- is that the county line or -- one thing seems to be part of the other.

A. I'm looking for the details. The mining that took place south on the south part of the North Mine by National Potash Company actually abuts the mining from the East Mine. And they only left a 50-foot barrier pillar on each side of the lease. And my map doesn't show that detail on here, so I can't point it exactly to you, whether it's right --

Q. Would it roughly be -- well, but the East Mine really goes kind of in a northeasterly direction, it looks like to me. And it does go from Eddy County into Lea County.

A. Right. I'm not sure if I can identify that

barrier pillar, but it's somewhere either in Section 31 or Section 30 of 32 East, South.

Q. Okay. That's a bit confusing.

A. It is.

Q. You had mentioned, Mr. Harvey, that you log your core holes.

A. Yes, we do.

Q. What kind of logs do you run on those?

A. We're running a full suite of logs right now of gamma ray density, neutron logs, and I'm not sure if we're running a resistivity or porosity tool. I'd have to leave it to our geologist, Jim Lewis, to testify to that.

Q. And are those slim hole tools?

A. Yes.

Q. Those are fairly small bore hole tools.

A. Yes, they are.

Q. Why do you log them? What are you looking for?

A. Well, there's two reasons, actually. One is very simple: To make sure that we are properly correlating the ore zones. What we've found is that when holes are just cored, sometimes there's a mistake in the core point. And sometimes zones that are thought to be barren are not because they blew it and cored the wrong spot. And sometimes they attribute the mineralized zone to the wrong ore body. So purely for stratographic correlation is one reason.

And second of all, we're very interested in continuing to add to our database of information which allows us to use geophysical logging in conjunction with other data to identify mineralized potash zones.

Q. So then you do believe that electric logs will help you identify commercial potash?

A. They are extremely useful, and not just in potash, but also in langbeinite.

Q. On your graph that you did here for us, you talk about -- several times you mentioned being able to determine if the well was properly plugged and abandoned.

A. Yes.

Q. How does one determine if a well has been properly plugged and abandoned that was drilled in the '30s or '40s?

A. If you go back to the records of the '30s and '40s, of course, you know, you find that there are some records. And again, I haven't had the opportunity to go through this because I just got these records last night. But the ones I looked at, the plugging records were actually surprising complete. However, that said, it depends on where the well is located, but --

Q. So if there was --

A. If there's some concern about it, we're just going to go rig up a rig and wash it down and re-plug it.

Q. So if this was one of those wells here that you've drawn here on your graph, you're going to re-enter that well --

A. Correct.

Q. -- with drill pipe or something and then go in with some type of a log. So if it is plugged, you're going to have to drill that plug out?

A. And re-plug it.

Q. Yes.

A. Our alternative is that if we're unable to do that successfully mechanically, then we are going to have to re-evaluate the amount of distance we leave between that well bore and our mining.

Q. So you're going to have to bring in a drilling rig probably?

A. We'd use the same type of drilling equipment that we use to drill these core holes.

MR. WARNELL: Thank you. I have no further questions.

MR. BROOKS: Recross?

MR. MANGES: Redirect?

MR. BROOKS: Redirect. I'm sorry.

REDIRECT EXAMINATION

BY MR. MANGES:

Q. Mr. Harvey, you were asked several questions

about the feasibility study. And one of those questions was directed towards the S1. And isn't it true that a feasibility study for the SEC requirements is different than a feasibility study that you might use for your own company's internal uses or purposes?

A. Generally speaking, a feasibility study that's used under SEC terms is used in conjunction with determining whether you have ore or not. That means that before we can say that a particular strata has ore, which means it's commercial minable and profitable under current economic condition, we have to know what the costs are to mine that. That's generally what a feasibility study means for SEC purposes, capital costs as well as operating costs.

A feasibility study for our purposes, we're just trying to determine purely what the economics are of future investment and we're not trying to classify ore with it, if you will.

Q. Right. And when you were testifying about the feasibility study that is being performed by Tetra Tech, you weren't referring to the kind of feasibility study that would satisfy SEC requirements, were you?

A. It could eventually lead to that, but at this stage, no, we're not.

Q. And it's true, is it not, that Tetra Tech is on the ground actually conducting this study?

A. Yes.

Q. And you've authorized that?

A. Yes.

Q. And what was the expense? Do you recall how much that contract was worth?

A. No. I believe the initial scoping on it was something in the neighborhood of $100,000.

Q. Now, you were asked a series of questions about Section 16. Now, I'd like you just to assume that the State Land Office were to grant Intrepid a lease for that section. What would your next step be?

A. Well, you know, again, we're going to continue on with our feasibility study, pre-feasibility and feasibility study, for opening in Section 16. And we would initiate further work on those -- examination of these wells in Section 16 at the appropriate time once we determine that we are, in fact, interested in mining those reserves in there, the ore in there. We'd also wait for the completion of the Sandia Lab study before we would declare it as ore.

Q. Okay. You were asked some questions about the geophysical logs and how they weren't recognized by the BLM. Are they, in fact, recognized by the State of the New Mexico as valid tools to measure ore?

A. I couldn't testify to that.

Q. Okay. Would you, once the -- assuming, again,

that you were able to get the Section 16 lease from the State Land Office, would you include it in a mine plan so with the overall plan including the North Mine?

A. Once we have these other issues determined, we would. Again, if you want clarification on that, I'm talking about the gas migration study completion --

Q. Right.

A. -- as well as the completion of the study of the existing well bores out there and how they would be dealt with.

MR. MANGES: Thank you. We have no further questions, Mr. Examiner.

MR. FELDEWERT: I have a couple.

MR. BROOKS: Okay. Recross.

RECROSS-EXAMINATION

BY MR. FELDEWERT:

Q. It dawned on me, Mr. Harvey, that all you're really thinking about in terms of Section 16 is mining just the one ore zone, the 10th ore zone.

A. That's correct.

Q. None of the other ore zones are projected to--

A. We have not had time to study the ore zones in there.

Q. Now, you mentioned the difference between an SEC feasibility study and the company. Did I understand you to say that when you talk about a feasibility study for SEC purposes,

you're talking about one that includes a determination of how much it would cost to mine a particular area?

A. That's right.

Q. Which goes into whether it's commercially recoverable, correct?

A. That's correct.

Q. And if I'm understanding you, you have not even started to determine whether the ore in Section 16 is commercially recoverable.

A. Again, are you -- let me clarify your question. Are you asking me if we have started to determine whether it's ore under the SEC definitions, or whether we think that we're interested in investing the money to mine it?

Q. Is it ore under SEC definitions?

A. Not right now. No, it's not.

Q. Okay. And what you're trying to determine internally is whether it's ore that is commercially recoverable.

A. We are trying to determine whether it's ore that we're willing to go mine because we think we can mine it at a profit.

Q. Okay. But you haven't made that determination?

A. We have not made that determination.

Q. You have not determined yet whether this ore is commercially recoverable?

A. That's correct.

MR. FELDEWERT: That's all I have.

MR. BROOKS: Very good. Let's take about a seven-minute recess here.

Fasken has three hours, 49 minutes; Intrepid has five hours, three minutes.

[Recess taken from 4:44 p.m. to 4:53 p.m., and testimony continued as follows:]

MR. BROOKS: We're again now on record.

MR. FELDEWERT: Mr. Examiner, I have those extra pages for your notebook, Exhibit 25.

MR. BROOKS: Exhibit 25. Okay. Thank you. Very good. Do you have a copy for Mr. Warnell?

MR. WARNELL: I've got it.

MR. BROOKS: Very good. I understand that Mr. Manges wants to recall Mr. Harvey.

MR. MANGES: Mr. Harvey, I'd like to recall you to ask just one simple question that was left at the very end of your testimony.

In re-recross, I believe you testified that Intrepid had not determined whether Section 16 contained commercially mineable potash. What I would like to have you do is assume that the pillars shown on Exhibit I-10 -- and these are the 400-foot pillars around the individual gas wells were sufficient -- determined to be sufficient, say, by the BLM and

safety study -- whether given that assumption, Section 16 contained commercially mineable potash.

THE WITNESS: Yes. If it was determined that the pillars were of this size or approximately this size, there is no doubt that it would be commercially mineable potash.

MR. MANGES: Só is the grade, then, sufficient to meet what Intrepid used to be commercially minable?

THE WITNESS: Yes. And not just Intrepid's determination, but also the BLM's definition.

MR. FELDEWERT: Thank you. That's all we have.

MR. BROOKS: Further cross-examination?

MR. FELDEWERT: No, Mr. Examiner.

MR. BROOKS: You may step down again, Mr. Harvey. And you may call your next witness, Mr. Manges.

MR. MANGES: We call Mr. Leo -- or pardon me, Dr. Leo Van Sambeek.

MR. BROOKS: Would you say your name again, please?

THE WITNESS: Leo Van Sambeek. Just a little bit Dutch.

MR. BROOKS: And spell the last name.

THE WITNESS: The last name is Van, V-a-n, Sambeek, S-a-m-b-e-e-k.

MR. BROOKS: Very good.

DR. LEO VAN SAMBEEK

after having been first duly sworn under oath,

was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. MANGES:

Q. Will you state your name for the record, please, sir. You've done that, but --

A. Leo Van Sambeek.

Q. Okay. And what is your present employment, sir?

A. I work for a company called Respect out of Rapid City South Dakota where I'm a consulting mining engineer.

Q. What's your educational background?

A. I have a BS, or Bachelor's of Science, and Master's of Science in mining engineering from the South Dakota School of Mines in 1972 and 1974, and a Ph.D. in mining engineering from the Colorado School of Mines in 1986.

Q. What is your specialty in mining?

A. Since 1975, I've worked almost exclusively in salt and potash mining and storage in salt formations.

Q. What kind of projects have you performed in this area?

A. I've worked on mine designs. I've done extensive or many, many hours anyway, of work with flooding mines, salt mines, potash mines. Also with -- I do or direct laboratory investigations to measure properties of salt. I direct

engineering analysis using numerical models to model the behavior of salt and potash. But primarily, I'm the guy that goes out to the mine and works hand in hand with the mining company on their problems. That's my role within RESPEC.

Q. Do you have any expertise in rock mechanics?

A. I like to claim that, in fact, that is my expertise.

Q. Have you authored any publications in that area?

A. Probably about somewhere between 80 and 100 publications in salt mechanics, rock mechanics.

Q. I'd like you to go ahead and look at the exhibit notebook and turn to Intrepid No. 22. And back at the back is your resume?

A. That's correct.

Q. It's found on Page 1239. Do you see that?

A. Yes.

Q. Is that a true and accurate copy of your resume?

A. Yes, it is, as of probably three years ago, two years ago.

Q. Okay. And attached to the resume there's a number -- a list of publications, the most recent being 2005?

A. That is correct.

Q. And is that a comprehensive list of --

A. As of 2005, yes.

MR. MANGES: We would tender Dr. Van Sambeek as an

expert in the field of mining engineering.

MR. FELDEWERT: Expert in the field of potash mine engineering?

MR. MANGES: General, I think. General mine engineering.

THE WITNESS: General mining?

MR. FELDEWERT: Engineering? No objection.

Q. (By Mr. Manges): Doctor, I'd like to ask you what hazard does an oil and gas well present to a potash mine?

A. Well, the hazard of an active oil and gas well is that the casing, the cement, and the rock is the only protection afforded between the gas in the well and the open space of the mine. So if there are mechanical processes that the mine generates or that mother nature generates, then if any one of those components is damaged, you run the risk of gas or oil -- but primarily gas -- or water from above, is also a risk entering the mine.

And I think relative to the exhibit that I was directed to look to for my resume, there is, in fact, a dissertation there of several of those components that can interact or act by themselves. And fortunately, we do not have any case history of any disasters in the New Mexico potash industry of where an oil or gas well has caused major problems or fatalities.

But the circumstances, you know, still exist of the

mechanical processes around the potash mine, the physical geometry of the oil wells. What I'm showing in this report is how, you know, this system has failed here, this system has failed here, this system has failed here, and what we're tying to avoid is the confluence of any or all of them happening and causing a disaster.

Q. You're referring to Exhibit 22?

A. That is Exhibit 22.

Q. What was the purpose of preparing this report?

A. It was to be presented as an opinion on the risks of concurrent development of oil and gas wells next to the New Mexico potash mines.

Q. Is this specific to the New Mexico potash mines?

A. Yes. Yes, it is.

Q. And did you come to an opinion regarding that issue?

A. Yes. I came to the opinion that there is a definite need for a buffer zone between potash mines and oil wells that are being drilled.

Q. Okay. What about gas wells?

A. Excuse me. Oil and gas wells.

Q. Okay. And in that opinion, did you -- well, let me ask you this: Does this refer to active gas wells?

A. That's correct.

Q. What I'm talking about --

A. Yes. Wells that are proposed and would be active while the mine is still active, yes.

Q. Is this a true and accurate copy of your report?

A. Yes.

Q. And does it a provide a reasonable basis for your opinion?

A. Yes.

MR. MANGES: All right. I move the admission of Intrepid 22.

MR. FELDEWERT: I haven't had a chance to review the reports, so I don't know if it's relevant to the issues, but I have no objection to them. I'm not going to lodge an objection.

MR. BROOKS: Intrepid Exhibit 22 is admitted.

[Respondent's Exhibit 22 admitted into evidence.]

Q. (By Mr. Manges): I'd like you to discuss the components that you speak about that may fail in terms of a well, a gas well for instance, threatening a potash mine?

A. Okay. Relative to the components that I looked at for the report, but also for the general situation, this is not the only oil and gas next to potash mine work that I've done. So the opinion has developed over a number of years.

The casing is the primary conduit to get gas from the reservoir to the surface. The casing resides within a cement sheet which couples that casing to the rock. But the rock is

certainly part of that barrier -- because it can do things. It both protects the casing and the cement sheet, but it also can destroy either one. And so those are the three components in the well bore counting the rock that exists around the well bore.

The mechanisms that the mine causes, the primary one, is shown on the exhibit here, No. 34, that Hugh Harvey drew of the subsidence. And I fully concur with this interpretation that subsidence that results from the mining can, in fact, disturb the rock, the cement sheet, and the casing. Now, the casing could become kinked, it could become buckled, it could, in fact, sheer, which is, you know, part of the industry experience. It can also pull apart under the effects of subsidence, but probably in the New Mexico situation.

Q. Okay. Now, is it true that gas can migrate distances once it is released in the formation?

A. Absolutely. Once the gas gets out of the well casing and it can many times travel along the cement sheet. You know, the cement sheet is not perfect. It's certainly a barrier, but not perfect.

Probably the classic example of -- can-the-gas-get out-of-the-casing-and-go-on-to-cause-damage -- is the natural gas release near Hutchinson, Kansas from the Yaggy Storage Field. Granted, that was a storage field, but the leak was from a milling accident that occurred in the casing. The

natural gas went up the cement sheet out of the salt formation and into a dolomite layer above the salt and then travelled seven miles before venting itself into unplugged but abandoned salt wells within the city limits of Hutchinson. And I think there's a picture in one of the exhibits that explains that.

Q. Could you turn to Intrepid Exhibit 33?

A. Yes. That is, you know, a very concise description of what we're talking about here. And the other important thing relative to this particular case history was that the pressure in the gas storage well was not above 600 PSI. So, you know, considerably lower than some of the pressures that we can be talking about in an active gas well.

Q. Okay. And does Exhibit 33 accurately summarize what your understanding of that gas migration disaster was about?

A. Yes, because I was very much an active part of coming up with this explanation.

Q. And did you study this incident?

A. Yes. I was working for the city of Hutchison during the disaster.

MR. MANGES: I move the admission of Exhibit 33.

MR. FELDEWERT: No objection.

MR. BROOKS: Exhibit 33 is admitted.

[Respondent's Exhibit 33 admitted into evidence.]

Q. (By Mr. Manges): Let's look at Exhibit 32. And

this talks about potential gas pathways to a mine from active wells. Again, we're talking about active wells, right?

A. Yes.

Q. Okay. And why don't you describe what this shows.

A. What this exhibit displays are some of the components that are somewhat outside of the ones that I listed before. You know, these are the components that can go in there besides those in the well and besides the mechanisms induced by mining. In this case, we could have flaws, if you will, in terms of like a break in the pipe, a fractured dike or faults, which these geologic anomalies could be activated by the subsidence process. And I apologize. I say subsidence instead of subsidence, if there's any problem with that.

Q. Okay. And is this exhibit true of your own study and experience?

A. Yes. It reflects my understanding. I cannot characterize this as my interpretation. But it's from the body of knowledge that exists within the entire mining industry relative to oil and gas wells next to salt or potash mines.

MR. MANGES: I move the admission of Intrepid Exhibit 32.

MR. FELDEWERT: No objection.

MR. BROOKS: Exhibit 32 is admitted.

[Respondent's Exhibit 32 admitted into evidence.]

Q. (By Mr. Manges): We've been talking thus far about active gas wells and the hazards presented by active gas wells to potash operations. I'd like to turn and have you discuss the hazards presented -- the difference between those and inactive or plugged and abandoned wells.

A. Yeah. I'm going to have to add an additional characterization there. Whether or -- ask for another characterization -- whether it's a deep gas well or a shallow oil and gas well.

Q. Oh. That's a good point. For the purposes of this hearing, we would use a plugged and abandoned shallow well.

A. Okay. In the previous characterizations of the deep gas wells, one of the driving forces is the high pressure gas, whereas in the shallow plugged and abandoned oil wells such as Section 16 or 17 or 18, number one, there's no mechanism for that high pressure gas. And number two, the oil is not as much of a fear to me as an engineer as gas releases into the mine.

So the fact that it was an oil well or an oil producer at one time in its life is not as significant. Probably the most significant part relative to the Section 16 wells is the protection of the mine relative to any water damage from above. If these wells are properly plugged to prevent water coming down into the mine, that would be my

number one concern. My number two concern would be to look through the records probably to assure myself of the type of plugs, the size of the plugs, the locations of plugs as far as the low pressure gas that would be below the mine.

Q. Okay. I'd like to look at Intrepid I10. That's the map that has the proposed mine plan in Section 16. Would you agree with Mr. Harvey's testimony that given the appropriate circumstances, it would be possible to mine within 200 feet? That would be a 200-foot radius of that plugged and abandoned well shown on that exhibit. And if so, what assumptions would you make?

A. Okay. In order to answer that question, the assumptions I would make or the information I would have to gather and confirm would relate to the mining plan, the geological setting.

In this case, I'd want to know the depth, which I've been told is 1,700 feet. I'd want to know the location of the number ten ore zone within the salt horizon, which I've been told is approximately 600 feet of salt above the mine. That's the critical thickness that I'm interested in. The fact that there's salt below the mine is also of interest. I would want to know what the extraction ratio is proposed for the mining area.

Q. And that's the amount of ore that is actually removed?

A. Right. The amount of ore that's removed versus the amount of pillar that's left behind, which with the retreat mining that Hugh Harvey testified to, those pillars would, in fact, be crushed, but they represent perhaps 8 percent of the ore before they're crushed by the subsidence process.

I would also want to know -- in this case, one of the critical parameters is what is the mining height. Because it is the height of these -- I'll call them the well pillars, the safety pillar that's left around the well -- the height of that pillar in addition to its width is what defines its structural integrity. If I take someone who is very tall and skinny and I put a load on top of them, they're likely to buckle. On the other hand, if you take someone who is very short and wide like myself, I can carry a lot more load. The same characterization can be given to these pillars. And so a short, very wide pillar has much more load bearing capacity than a taller, smaller pillar.

Q. Let's assume that the mining height is 5 1/2 feet.

A. Five and a half feet?

Q. Yes.

A. So what I would probably do, then -- my first assumption in looking at the integrity of the pillar, knowing its size, both its height and width -- some experience factors. I've worked around the salt and potash mines for 35 years.

I've written papers on pillar design.

For this type of pillar at a 1,700-foot depth, the minimum size that I could agree to would be 20 times its height. So if it's 5 1/2 foot tall, it would be 110 foot in diameter now, not to get confused. But that's not enough. That's just to have a stable pillar. Because there's a well in there, I would want to add in a fairly significant margin of safety. So I would probably add another 100 foot of width or another 50 foot of radius. And then over and above that --

Q. Let me just stop you now. So you're up to 200 feet --

A. I'm now up to --

Q. -- in terms of diameter?

A. 200 feet in terms of -- well, actually over 200 feet. I've got to stop and think now. 160 feet in diameter.

Q. Okay.

A. 110 plus 50. No -- excuse me. I'll get the number yet. In radius -- when you think in width, it kind of screws you up.

The pillar width, strictly for the width to height ratio, would be 110 feet. I would then add another 100 feet because there would be an oil well in it, so essentially doubling it because there's an oil well. So that would be 210 feet.

Q. Okay.

A. And then I would want to add an additional factor of safety because of the intensity of mining around these pillars. If I look at the pillars that are in the center portion of Section 16, there's intense mining around it. So I would probably add something like another 100 feet of additional pillar width to get that load bearing capacity to protect the oil well that's in it.

Q. So now, are you testifying it would be 310 feet based on what we've talked about so far?

A. Right. So that would be 310 feet of width or 150 feet of radius.

Q. All right.

A. That would be my first -- let's -- sometimes we engineers call that the back of the envelope. And so when I look at this and see that a 400-foot wide or 200-foot radius pillar is what's laid out here, yes, I could agree that that aspect is a viable mine.

The other thing that I noticed when I looked at this very preliminary mine layout is the 350 barrier pillar that is being used to protect the mains. The mains here being the infrastructure routes, the conveyor, electrical, water, travel ways. It's obvious that whoever drew this mine design, if they paid attention to the previous history in the New Mexico potash basin, has selected a pillar width that has worked over the last many, many years.

Q. And you're talking about the 350 foot wide --

A. "350 Foot Barrier Protection For Haulage Way" is the way it's labeled across the northern part of Section 16.

Q. Now, based upon your experience in the potash basin, is that a sufficiently wide barrier pillar to protect haulage ways?

A. Right. For a 1,700-foot depth, that would be very consistent with the other mines that I've worked. I've designed barrier pillar, primarily in salt, but in this case, the salt and the potash are quite similar because, in fact, potash ore is predominantly salt.

Q. Okay. So based on all of those, that experience and the assumptions that you've set forth, do you have an opinion as to whether this mine plan would work for that 10th ore zone?

A. Yes. It would certainly pass the conceptual design criteria of being a feasible mine layout.

Q. Okay. And one of these subjects, I just want to be clear that you're talking about all of those wells being plugged and abandoned shallow oil wells; is that correct?

A. That's correct.

Q. And what about bottom hole deviation? Did you account for that?

A. That was -- okay, I didn't specifically say bottom hole deviation, but when I said I wanted to have that

extra margin of safety in there, that was kind of rolled into that. I would expect -- my experience has been vertical wells like this, make an allowance for at least 2 1/2 percent of the depth as the potential for bottom hole deviation. So that would be about 40 feet.

But I've kind of rolled that 40 feet into the 300, but it could also be added to the 300 if I had some reason to believe that the deviation exceeded that.

Q. And that would require further study, I take it?

A. That would, yes. Or at least speaking to someone that's familiar with this area of what a typical deviation would be.

Q. Now, are you -- are there -- we've talked about this BLM study that's ongoing with Sandia National Laboratories. Are you participating in that in any fashion?

A. I'm not formally participating in the Sandia study. I am very much aware of it because that's very close to what, you know, I talked about in whatever exhibit that was.

Q. Prior to that study being done, are there any other studies that you're aware of that study this issue in this potash basin?

A. There's one other study or series of studies that I'm aware of. By shorthand I call them the Hazlett Teufel analyses which were, in fact, referenced in Exhibit 22.

Q. That would be the --

A. The one with my resume. So I am definitely aware of their work in potash and I comment on it quite extensively in the report.

Q. Do those studies directly address what we're talking about here and that is gas migration in the Carlsbad potash area?

A. Those studies did, in fact, address gas migration. In my opinion, they totally missed the mark. They were inadequately performed in terms of the numerical modeling that was done. They mischaracterized the behavior of salt and there's no way that I could ever accept their conclusions.

Q. Okay. Would you advise awaiting the completion of the BLM/Sandia National Lab study to determine pillar size in the basin?

A. I think that is exactly what is needed, is to develop the science for what is actually taking place.

MR. MANGES: Thank you very much. I have no further questions.

MR. BROOKS: Cross-examination, Mr. Feldewert?

CROSS-EXAMINATION

BY MR. FELDEWERT:

Q. Let me ask you. You testified about buffer zones based on your studies. What kind of a buffer zone or safety pillar do you think is necessary for an active deep gas well?

A. Okay. I'm going to assume that that is next to

an active mine or an inactive mine? Is there a characterization?

Q. No. Go ahead. How much would you need for -- how much of a pillar would you need or safety pillar would you need for an active deep gas well next to an active potash mine?

A. I have no reason to state a number for New Mexico, other than what is in R-111-P, pending the results of the investigation.

Q. The half mile?

A. A half mile.

Q. Now, what about an inactive mine?

A. If it was an inactive mine, one that is inactive and sealed?

Q. Let's just talk about one that is inactive.

A. To never be opened again?

Q. All right. We're creating a long list here.

A. Yes. Until the mine is completely abandoned, it's an active mine, so I'd have to stay with the half mile.

Q. So why did you draw a distinction between -- or have me draw a distinction between an active and an inactive mine?

A. Because mines are re-opened every day -- not every day of the week. A mine is never closed until it's closed.

Q. Okay. So you're saying a half-mile pillar

whether the mine is active or inactive unless it's sealed in some fashion?

A. Right. Unless it's been abandoned. And by abandoned, I mine closed.

Q. Okay. Now --

A. Typically for a mine like this, that signal would be that the shafts have been plugged.

Q. Okay. What about an inactive deep gas well? Do you need a half-mile pillar?

MR. MANGES: Inactive or plugged and abandoned?

MR. FELDEWERT: Sorry.

Q. (By Mr. Feldewert): Plugged and abandoned.

A. A plugged and abandoned deep gas well, I would -- one could certainly, after studying that well, mine closer than a half mile.

Q. How close?

A. I would have to go through the, you know, the things of depth, pillar size, the intensity of mining around it or the mining pattern that's being used, whether there are any barrier pillars, you know, in the area. The question as stated is too general to answer, other than to say that my general feeling would be that you could probably mine closer to a properly abandoned well.

With the right mining layout, in fact, I could drill around or past that well. Now, I don't know if that's the

question you were asking or not.

Q. You testified to -- what was your testimony on a radius pillar for these existing wells in Section 16? What did you testify to at that time?

A. I believe the calculation was 310 foot radius would be my probably minimum without going beyond the back of the envelope type analysis.

Q. That's just a quick simple model is what you come up with?

A. It's based on my pillar design equations.

Q. Okay. So you came up with a 310-foot radius for these existing wells --

A. Excuse me. A 310-foot diameter.

Q. Diameter. That would be the circle.

A. That's correct.

Q. All right. In Section 16. Now, what assumptions did you rely upon coming up with this 310-foot diameter? That's what I was unclear about. Can you list them for me?

A. The depth to the mine.

Q. What was your assumption?

A. 1,700 feet.

Q. Okay.

A. The thickness of the salt above the mine, 600 feet.

Q. Six hundred?

A. In an intensely mined area around these pillars at something on the order of 90 percent.

Q. So that means they take out 90 percent of the material?

A. That's right.

Q. Okay.

A. A mining height of 5 1/2 feet.

Q. Any other assumptions that you made?

A. I do not recall any other assumptions.

Q. Okay. Have you done any kind of an examination of these wells in Section 16?

A. No. I have not.

Q. Okay.

A. I'm only assuming they were properly plugged and abandoned.

Q. And did you testify that you took into account potential deviation in your diameter of pillar?

A. It was embedded in -- if you recall, I said the absolute minimum starting point was going to be 20 times the mining height and then I arbitrarily added 100 feet. I kind of rolled that deviation into that arbitrary 100. But I would be willing to add it on to the 310 also, probably another 40 feet. Because that would be 2 1/2 percent of the depth.

Q. Would that depend on the amount of the deviation?

A. It certainly would, yes. But that will always be

an unknown unless we re-enter the well. So we can only go on what would be realistic values. And then we could probably conservatively assume that it was all on one side rather than being a random.

Q. Good point. So what do you assume in terms of deviation in terms of coming up with your pillar number?

A. I assumed 2 1/2 percent of the depth or 40 feet. It's 40 high feet.

Q. Of deviation?

A. Yes.

Q. Okay.

A. It's what I'm making an allowance for. I'm not saying that it exists, but that's what I'm making an allowance for.

Q. So the deviation is greater, you would have to come up with more allowance?

A. That's correct.

Q. Okay. Would it change your estimate of a pillar if these wells produced gas?

A. If the gas is depleted and the well is properly plugged and abandoned, no.

Q. Does it change it if it was sour gas?

A. If the gas is depleted and the well is properly plugged and abandoned, no.

Q. Let me have you take a look at your report here

marked as Exhibit 22. Do you have that?

A. Yes.

Q. Okay. Now this is the first time I had a chance to take a look at this. But as I was glancing through it, as I understand it here, Dr. Van Sambeek --

A. Either one will work.

Q. What you're doing here in this report is you're actually responding to the conclusions of Hazlett and Teufel; is that correct?

A. That's correct.

Q. And I'm looking at Page 3 and you're responding to their conclusion that a plugged well in the Delaware that gas will not migrate?

A. Where are we?

Q. I'm sorry. At the bottom of the page.

A. Okay.

Q. Is that correct? In other words, you list the Hazlett and Teufel conclusion --

A. Okay.

Q. -- and then you're responding to it?

A. That is correct.

Q. And you state at the bottom -- or halfway down, you state, "In my opinion, they fail to recognize that Delaware gas pressure is recoverable given enough time either by gas movement within the Delaware or by time-dependent porosity

change. Further, the potash ore in the mine will be subject to change by the dilation and will lose its impermeability and suffer a loss of pore pressure."

Do you see that?

A. Yes.

Q. Now, couldn't that same conclusion hold true to the Yates halfway field?

A. Not within the characterization of the Hazlett and Teufel collusion.

Q. Is it a possibility, Doctor, that whatever gas was produced in the Yates halfway field could have recovered its pressure given enough time?

A. Yes.

Q. Okay.

A. But I would also add that the difference in contrast here is the depth of the reservoir.

Q. You also make notes on Page 11 of your report. And you're talking about debonding at cement-salt interface. Do you see that?

A. Yes.

Q. And in the second photograph you state in the first sentence that the "Integrity of the cement is vital to Hazlett and Teufel's arguments for the certainty of protection against leakage. In my experience, cement integrity is not always achieved during placement and integrity can apparently

be lost when most needed." Do you see that?

A. Yes, I do.

Q. In terms of the status of the plugging operations within Section 16 for these existing wells, we don't know the integrity of the cement out there, do we?

A. That is correct. But I would say in the context of this discussion is for a cement to salt bond within a pillar that is only 60-foot wide.

Q. Okay.

A. And that the integrity -- and what they're talking about is the casing within that mine height. And so what is characterized in this paragraph does not follow to what you said about the integrity of the cement in a properly plugged and abandoned well.

Q. Do you think the integrity of the cement in a plugged and abandoned well from the 1950s or '60s is an important consideration?

A. Yes, it is.

Q. In Section 16?

A. That -- okay. Within Section 16 we've said that we would have to do an investigation of the plugging records to find out whether we believe these wells were properly plugged and abandoned. The integrity of that plug would relate to the time that it was plugged, the experience -- you know, the experience of the operator. It could be something as simple as

seeing how many sacks of cements they used.

Q. Right. So as we sit here --

A. Whether the plug was tagged after placement. So there are things that can go into determining the quality of that plug. What this paragraph is talking about is the cement outside the casing that was placed during the drilling of the well.

Q. Okay. In terms of the integrity of the plug that may or may not exist in these wells in Section 16, how do we go about determining the integrity of those plugs?

A. The number one -- or the very first thing we would do would be to review the plugging records, the total record package for the well.

Q. And what about if they were insufficient to tell us?

A. Then we would have two choices. We could either perhaps re-enter the well to investigate the quality of that plug or we could decide to just leave a bigger protection pillar around it, based either on the current state of our knowledge on salt behavior or await the results of the more definitive study.

Q. If I'm understanding your testimony correctly, your statement about a -- I think you're up to at least a 310-foot diameter pillar -- is based on a series of assumptions, correct?

A. They're based on series of assumptions given that I've not collected facts.

Q. Okay. So you're using -- you're just taking a series of factual assumptions that you have not verified yourself?

A. That's correct.

Q. Okay. And to your knowledge, has anybody verified the factual assumptions that you're relying on?

A. I'm going to assume that they have not been mischaracterized to me. When I ask what is the mining height, I was told it was 5 1/2 feet would be a good number to use. Because it's not an absolute within the mine.

I was told that the depth to the number 10 Ore Zone, a good number to use would be 1,700 feet. I would say that within Section 16, if the dip is 1 percent, it's going to vary by 17 feet. But 1,700 feet is a representative number.

Then extraction ratio of 90 percent is based on an average of how much ore is taken out over a large area. Within a small area, it could be higher, it could be lower. But overall, the 90 percent would be a representative number. So I'm working -- the numbers that I asked for in terms of what are representative numbers, those are the facts that I'm calling assumptions.

Q. Okay. All right. And then I'm looking at your report. What exhibit is that?

A. Twenty-two.

Q. Twenty-two. I'm sorry.

A. The first report, I think. That's the only one that's entered.

Q. And I have Page 3, but I don't have Page 4 or 5.

A. They must have been inflammatory.

Q. You have Page 4 or 5 in yours?

A. I have 3 and then I got to 6. No, I do not have 4 and 5.

MR. FELDEWERT: Does anyone have pages --

MR. MANGES: That's our error. We'll have to fix that.

Q. (By Mr. Feldewert): I was just curious as to what you were addressing on Page 4 and 5.

A. I would have been -- if I can go to my briefcase, I can tell you exactly what's on 4 and 5.

MR. MANGES: Should we do that?

MR. BROOKS: Okay.

MR. MANGES: Let's do that.

[Discussion off the record.]

THE WITNESS: You know, I say that, and I'm going to have to eat my words.

Q. (By Mr. Feldewert): You don't have them either? They must have been --

A. Somehow or another the PDF must not have Pages 4

and 5. I don't have the original document records.

Q. If somebody would just commit to sending us those pages, I would appreciate that. I realize I won't have an opportunity to examine then, but that's fine.

MR. MANGES: We'll get them.

MR. BROOKS: We'll supplement the record with them next week.

MR. MANGES: We'll do that.

MR. BROOKS: Okay.

MR. FELDEWERT: That's all the questions I have. Thank you.

MR. BROOKS: Okay.

MR. FELDEWERT: I'm sorry, Mr. Brooks, I do have one more question.

MR. BROOKS: Okay. Go ahead.

Q. (By Mr. Feldewert): Doctor, what do you -- and I forgot about this and got off my train of thought.

What do you consider to be an appropriate pillar zone for an active shallow well?

MR. MANGES: Active what?

Q. (By Mr. Feldewert): An active shallow well.

A. An active producing -- to drill I'm going to -- if an oil company comes in and requests to drill next to a potash mine, what would be an appropriate safety pillar or buffer to leave the proposed well and the mine; is that the

question?

Q. Yes.

A. Again, I would have to say that for the New Mexico situation, we would probably have to rely on R-111-P and the results of the Sandia study. There just is not a scientific foundation for these active wells.

Again, I'd have to ask for a number of assumptions. What's the probable internal pressure in that casing relative to my pillar size? It could be something as much as what is the direction of the air flow at that particular part of the mine.

Q. Can I short-circuit you here?

A. Okay.

Q. I'm understanding you, unless you got specific evidence of the type that you've described here for a particular location, it would be your opinion that you should rely on R-111-P for a safety pillar set forth in the order, correct?

A. As an engineer, that's the only thing I can rely on.

Q. And that would be for active or inactive wells, would it not?

A. If you ask my interpretation of R-111-P --

Q. Well, I'm asking for your opinion in terms of the safety.

A. R-111-P dose not relate to anything other than a drilling of a well.

Q. And my question to you is: Are you willing to sit here and apply a different safety pillar to an inactive well without knowing more specifics about that particular well?

A. When you say "different," you mean different than R-111-P?

Q. Yes.

A. Absolutely. Because the conditions are different.

Q. Okay.

A. There's no active gas pressure in that well.

MR. FELDEWERT: Okay. That's all I have. Thank you.

MR. BROOKS: Thank you.

EXAMINATION

BY MR. BROOKS:

Q. You said that for a plugged and abandoned well you would advise a pillar of a diameter of 310 feet?

A. I do not think I characterized it as advise. That would be the absolute minimum that I would point to in a conceptual sort of phase. What I would call the back of the envelope. I would not -- there's no way that I would advise Intrepid Potash. There's no way I would advise the oil company of what size that pillar should be based solely on the back of the envelope calculation that I did 20 times the mining height

plus 100 feet. I'd be run out of the State of New Mexico.

Q. Okay. So you're saying -- when you say "back of the envelope," you mean that's an informal -- that's a description of it being a very informal type of quick calculation?

A. What we would call -- I mean, would I reject this pillar size of 400 foot as being inadequate? The answer would be no, I would not reject that as being an adequate pillar size.

Q. You would not reject it as being an inadequate pillar size; is that correct?

A. Yes, you're right. It must be getting later than I thought. In other words, it passes what I would call the ha-ha test. It, in fact, looks like the reasonable pillar size given that the mining height is 5 1/2 feet, given that the wells are plugged and abandoned, and given the rest of the litany?

Q. Okay. Now, your opinion that the minimum, this minimum of a 310-foot diameter, was that conditioned to it being an abandoned shallow gas well?

A. Yes, it was.

Q. Now, Mr. Feldewert asked you some questions about an abandoned deep gas well and I never got clear what your answer was, so could you repeat that for me?

A. I believe my answer to that was that I would have

to do more analysis, and that I would prefer to wait to find out what the results of this Sandia study is. Which is one of the first definitive -- or at least put forth as a definitive -- and scientific study of this matter.

Q. Yeah. A deep gas well presumably would not be abandoned just like a shallow gas well would not be until the pressure was substantially depleted. Would you agree?

A. That's correct. In fact, when I said properly plugged and abandoned, I also had depleted in front of that characterization.

Q. Right. So you wouldn't expect there to be gas at extremely high pressures in a depleted well that had been plugged and abandoned, even if it went to a deep formation?

A. Certainly not soon afterwards. Now, if I come back 100 years from now, I think that pressure could, in fact, have re-established itself below the plug.

Q. Okay. Very good.

MR. BROOKS: I think that's all I have. Mr. Warnell?

EXAMINATION

BY MR. WARNELL:

Q. Well, I'm still kind of hung up on these existing shallow wells that were drilled back in the '30s and '40s. I would suspect, knowing what I do about the oil industry, that those are in pretty bad shape. I'd be surprised if you could get down them, most any of them or enter them without a lot of

work. So there's probably little or no cement in them.

I think there's probably little or no casing in a lot of those wells. What would that do to your pillar size if there was missing casing and there was no casing in these wells?

A. No casing above the salt, or no casing at all?

Q. Probably no casing at all.

A. I would -- my first reaction is if there's no casing at all, it would be an easy well to re-enter. So I would probably lean towards drilling it out and cementing it from the salt -- from somewhere within the salt section to surface. Now, whether I'd go clear to the mine, I'd have to think about that.

So if there's no casing in it at all, it's actually the easier case.

Q. So you would drill it and cement it --

A. And wash it out.

Q. -- would you run pipe and then cement the pipe in?

A. No.

Q. You would just --

A. I'm outside my field. I'm not going to testify about what the proper way procedurally is to do this. What would be important is that at the end of day, if I was then asked, "Are you now willing to accept this size pillar given

what we've done in this well?" Then I would make an evaluation.

But I'm not going to be the one to design what would be done in that well.

MR. WARNELL: Okay. That's all I've got. Thank you.

MR. BROOKS: Okay. Any direct?

REDIRECT EXAMINATION

BY MR. MANGES:

Q. You were asked some questions about R-111-P and whether it applied to abandoned or active wells. And I just want to read this into the record.

As far as the one quarter, one mile issue goes, the regulation reads, "Applications to drill outside the LMR will be approved as indicated below provided there's no protest from the potash lessee within 20 days of his receipt or copy of the notice.

"A: A shallow well shall be drilled no closer to the LMR than 1/4 mile or 1/10 percent of the deposit, whichever is greater.

"B: A deep well shall be drilled no closer than 1/2 mile from the LMR."

So this regulation at least, would you agree, is a prospective regulation that applies to wells drilled after R-111-P. Obviously, the regulation wasn't in existence in the '30s or '40s or '50s and it wouldn't have applied to those

wells; is that right?

MR. FELDEWERT: I object to the form of the question. I think it's outside his field of expertise.

MR. MANGES: Well, he's asked about the application of a regulation.

MR. BROOKS: Well, the witness may disclaim expertise if he cannot answer the question. Otherwise, I'll overrule the objection.

THE WITNESS: I believe R-111-P was legislated in 1988, and the wells were drilled in 1940. So I think that regulation came after the wells were drilled.

Q. (By Mr. Manges): And you've referred to the Sandia Labs test in the Permian study and you're awaiting the results of that study. Isn't it true there's been studies in the Trona area and other jurisdictions have addressed this issue with respect to their specific geological situation?

A. Yes. In fact, I think the -- it would be my impression that the BLM/Sandia study is intended to very much follow what was done at the Trona mines in Wyoming where BLM had a joint, JIC, Joint Industry Commission study of the effects of oil and gas well drilling next to the Trona mines.

Q. Is Exhibit 24 a copy of the report -- draft report of the Intrepid 24?

A. Yes. I think this was their final draft conclusions.

Q. Okay.

A. And to my knowledge, they were adopted as final, but I guess I had never noticed before that it said draft on the top.

Q. And have you reviewed this?

A. Yes.

MR. MANGES: We move the admission of Intrepid Exhibit 24.

MR. FELDEWERT: Mr. Examiner, this is some area other than the potash area in New Mexico. It's a draft and we can't authenticate whether it's even an accurate draft or an accurate document. So I would object to the admission of this document. It's hearsay, and it's not relevant.

MR. BROOKS: I'll overrule the objection. Exhibit 24 will be admitted.

[Respondent's Exhibit 24 admitted into evidence.]

A. I would also say that similar studies have been done in Saskatchewan at the potash mines there relative to oil and gas drilling requests within the buffer zone.

Q. Okay.

A. But I don't have any documentation of that. I am personally aware of the studies that have been done.

Q. And would you agree that all the testimony that you've given with respect to the pillar width and your ideas in terms of the depth of the ore and all that would be subject in

your mind to whatever Sandia National Labs and the BLM further discover in terms of their investigation?

A. I think I might have missed the first part of the question, but I'm going to say yes. And then I'm going to say Sandia will have to address the exact same parameters, quantities, assumptions. If they do not, then it's going to be an incomplete study.

Q. So that means it's a site-specific study?

A. Site-specific, but it's going to have ranges. They're studies -- they're not going to look at 1,700 feet. They're probably going to look at what the minimum depth within the enclave, what's the maximum depth, what's the minimum mining height, what's the maximum mining height. They're going to have to do a sensitivity analysis on their conclusions that encompasses all of that.

Q. Thank you very much, Doctor.

MR. BROOKS: Thank you. Mr. Feldewert?

MR. FELDEWERT: No further questions, Mr. Examiner.

MR. BROOKS: Very good. We will then adjourn for the day. Fasken has three hours, 28 minutes left, and Intrepid has four hours, 28 minutes left, which is a total of seven hours, 56 minutes, or almost eight hours. So I'm going to say we'll get started at 8:30 on Monday.

MR. MANGES: You know, we had originally scheduled this for Tuesday. And then we talked about moving it to

Monday. But I don't think that ever got noticed, so I just need to check with my witnesses on their availability on Monday.

MR. BROOKS: Okay. My understanding was that it was set for Friday and we continue each day until concluded. I think there was some talk about moving it, but that was never done. But anyway, if you have witness availability problems, it's probably best we know about them now.

MR. MANGES: We're fine.

MR. FELDEWERT: May I inquire how many witnesses we may expect on Monday?

MR. MANGES: We have two.

MR. BROOKS: Two? Three or two? You said three and then your co-counsel held up two fingers.

MR. MANGES: Pardon me, now?

MR. BROOKS: Is it two or three?

MR. MANGES: It's well -- we may have one further witness. We may have three. We'll see.

MR. BROOKS: Very good. We will adjourn until 8:30 on Monday morning. Now, on Monday, we will not be in this room. We will be in the Office of the Secretary conference room, which is on the third floor of this building. You go up the elevators out there in front and when you get to the third floor, directly across from the elevator -- or more or less directly across from the elevator -- is the entrance to the

Office of the Sectary.

You go in and turn left. You go all the way to the end of the hall and you'll get to the Office of the Secretary conference room. This room is not available on Monday.

Okay. We will stand adjourned until 8:30 a.m. Monday morning.

[Hearing concluded.]

* * *

REPORTER'S CERTIFICATE

I, JOYCE D. CALVERT, Provisional Court Reporter for the State of New Mexico, do hereby certify that I reported the foregoing proceedings in stenographic shorthand and that the foregoing pages are a true and correct transcript of those proceedings and was reduced to printed form under my direct supervision.

I FURTHER CERTIFY that I am neither employed by nor related to any of the parties or attorneys in this case and that I have no interest in the final disposition of this proceeding.

Signed this 27th day of June, 2008.

JOYCE D. CALVERT
New Mexico P-03
License Expires: 7/31/09

STATE OF NEW MEXICO)
)
COUNTY OF BERNALILLO)

I, JOYCE D. CALVERT, a New Mexico Provisional Reporter, working under the direction and direct supervision of Paul Baca, New Mexico CCR License Number 112, hereby certify that I reported the attached proceedings; that pages numbered 1-290 inclusive, are a true and correct transcript of my stenographic notes. On the date I reported these proceedings, I was the holder of Provisional License Number P-03.

Dated at Albuquerque, New Mexico, 27th day of June, 2008.

Joyce D. Calvert
Provisional License #P-03
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Paul Baca, RPR
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