STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION



IN THE MATTER OF THE APPLICATION OF THE BOARD OF COUNTY COMMISSIONERS OF RIO ARRIBA COUNTY FOR CANCELLATION OR SUSPENSION OF APPLICATIONS FOR PERMITS TO DRILL (APDs) FILED BY APPROACH OPERATING, LLC, RIO ARRIBA COUNTY, NEW MEXICO. CASE NO. 14134

IN THE MATTER OF THE APPLICATION OF APPROACH OPERATING, LLC, FOR APPROVAL OF SIX APPLICATIONS FOR PERMITS TO DRILL, RIO ARRIBA COUNTY, NEW MEXICO CASE NO. 14141

REPORTER'S TRANSCRIPT OF PROCEEDINGS

SPECIAL EXAMINER HEARING



BEFORE: DAVID K. BROOKS, Legal Examiner

June 23, 2008

Santa Fe, New Mexico

This matter came for hearing before the New Mexico Oil Conservation Division, DAVID K. BROOKS, Legal Examiner, on June 23, 2008, at the New Mexico Energy, Minerals and Natural Resources Department, 1220 South St. Francis Drive, Room 102, Santa Fe, New Mexico.

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Examiner Hearing
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MR. BROOKS: We're back on the record in Case Nos. 131 -- I'm sorry. Case Nos. 14134 and 14141. I believe the County presented all their witnesses, but I don't believe that -- I do not recall that the County stated that they rest. Does the County rest?

MR. A. TRUJILLO: The County rests.

MR. BROOKS: Very good. You may proceed, Mr. Hall.

MR. HALL: Mr. Examiner, at this time we would call Ross Craft to the stand.

MR. BROOKS: Okay. Have your witnesses been sworn?

MR. HALL: Mr. Craft has been sworn.

MR. BROOKS: Very good. Mr. Craft, you've been sworn, and you're still under oath. You may proceed, Mr. Hall.

ROSS CRAFT

after having been first duly sworn under oath,

was questioned and testified as follows:

DIRECT EXAMINATION

BY MR. HALL:

Q. For the record, please state your name.

A. My name is Ross Craft. I'm president and CEO of Approach Resources.

Q. And where do you live, Mr. Craft?

A. I live in Fort Worth, Texas.

Q. Okay. Let me ask you, Mr. Craft, are you familiar with the areas that are the subject of these

proceedings today?

A. Yes, I am.

Q. And you're familiar with the applications that have been filed in these cases?

A. Yes, I am.

Q. Now, in our pre-hearing statement, I listed you as a geologist. That wasn't right, was it?

A. No. Actually, I'm a petroleum engineer. I'm a graduate from Texas A&M University.

Q. Sorry about that.

A. It's all right.

Q. I intend to elicit some geologic testimony from you. Let me ask you, have you previously testified before the Division or one of its examiners and had your credentials as a petroleum engineer or in any capacity established as a matter of record?

A. I have never testified in front of the OCD.

Q. Let's do this. Could you give the Hearing Examiner a brief summary of your educational background and work experience?

A. Sure. As I said earlier, I got a degree in petroleum engineering. I'm registered in the state of Texas. I've got about 28 years of experience predominantly in unconventional gas and tight gas, unconventional resources places as well.

I've got -- I've probably been involved or drilled personally -- I don't know, thousands of wells. I don't have no idea -- ranging from 15,000 foot all the way up to 2000 foot both international and domestic. A lot of it is tight gas shale gas, things like that.

Q. All right. Tell us, in the course of your career, have you been required to, in essence, do your own geologic analysis and study?

A. Oh, definitely. One thing we do -- and that's part of the reason why we've been very successful in doing what we do -- is a lot of what we do centers around geology. You have to know the geology before you know what to do to the rock to make it produce. And so there's a lot of -- whole lot of geology involved in what we do. Our engineering design is centered around geology. We have to know what makes up the rock. So there's quite a bit of geology involved in our operations, always has been.

Q. Now, have you evaluated the geology of the east El Vado lease area?

A. Yes. Yes, the geology on east El Vado, and if I may, I'll stand up and just --

Q. Well, let me establish your credentials first. Mr. Craft, based on your background and experience, do you feel that you're competent to provide the Hearing Examiner with expert testimony in areas of geology as well as petroleum

engineering?

A. On this, I really do, yes.

Q. Okay.

MR. HALL: At this point, Mr. Examiner, we would offer Mr. Craft as an expert petroleum engineer. He will also be up for purposes of expertise in the petroleum geology.

MR. BROOKS: Any objection?

MR. A. TRUJILLO: Mr. Hearing Examiner, if I could, I'd like to ask Mr. Craft just a couple of questions to establish.

MR. BROOKS: You may.

MR. A. TRUJILLO: Mr. Craft, are you a registered engineer in the state of New Mexico?

THE WITNESS: No.

MR. A. TRUJILLO: I think that's it. No objection.

MR. BROOKS: Mr. Craft is qualified as requested.

Q. (By Mr. Hall): Mr. Craft, would you tell the Hearing Examiner something about your company, Approach?

A. I'd be glad to.

Q. And if you would refer to the hearing exhibit notebook?

A. If you turn to Exhibit 1, please.

Q. What is Exhibit 1?

A. Exhibit 1 is the coverage of Approach Resources. It says, New Mexico Oil Conservation Division. And if you go

to the next page, what it is, is a quick overview of our management company history. Approach Resources -- we founded this company in 2002. We are a publicly traded company. We went public November of 2007. We trade on the NASDAQ, symbol AREX.

We operate in basically six areas, currently Texas being the bulk of our development operation with Cotton Valley, Bossier sand type environments in east Texas, the Ozona Northeast part of the Permian Basin and Cinco Terry. That's basically Canyon Sands, pluvial canyon sands. Ellenburger Formations, Strawn Formations, we have operations there as well, plus the Wolfcamp.

We also have operations in Kentucky. We're working on operations in New Mexico, and we're currently involved in a joint partnership in British Columbia drilling tight gas wells in very close proximity to the Peace River up south of Fort St. John.

We operate about roughly a little bit over 300 wells right now. These wells have been drilled since 2004. The first well was drilled February 2004. And the bulk of our operations has been for this company in Texas. My experience, as I said, and my colleague over there, Glenn Reed, we've been together since the I guess the 1990 era while I was at American Cometra which they hired me to develop their tight gas projects, which in turn we picked Glenn up. And Glenn and I

have been working together since that point. Glenn is currently our EVP head of operations and drilling and engineering for our company. I'm very active hands-on involvement. I still have a lot of involvement with engineering. A lot of times they would like me to get away from it, but I still stay in it.

And as I said earlier, we focus predominantly on unconventional rock, tight gas, shale gas, things such as that.

Q. Okay. Does Approach have an in-house geology staff as well?

A. Yes, we do. We have an in-house geology staff. We have one geologist currently. We had a second geologist but he recently retired. And I think he's moving to the mountains. And we're currently staffing up the geological staff quite a bit. That is one area that I place very highly on my list of needing -- you have to have a good geological staff. If you don't have geological stuff, then us engineers are basically shooting in the dark.

Q. Okay. Have you and your company had experience in operating in environmentally sensitive areas?

A. Yes. The east Texas operations and our Cotton Valley Sand, Bossier Sand, Cotton Valley Line Play, we're drilling in and around federal wetland classification areas. So we have to be very careful there building pipe lines, roads, structures such that where we're crossing the wetlands. We

have to take very -- we have to be very careful of what we do there, even to a point where we have to go underground with our pipelines by boring them and not by cutting ditches. We actually have to bore under the wetlands to get our pipelines in. So that's been an area that's been of high concern to us, but these wells are about 12, 13,000 feet, very large rigs out there, so we have to be very careful there.

In my previous, as I said when I was at American Cometra, when I was involved with that, one of our areas we operated in was the Piceance Basin up on Black Sulfur Creek in that area.

Q. Is that in Colorado?

A. This is in Colorado. And that was all BLM so we had to operate under the BLM guidelines as well there. Other areas we operate are very sensitive, especially to west Texas to artifacts and such as that, that we have to be aware of.

Q. Okay. If you look at your Exhibit 1, it's your PowerPoint presentation in hard copy form. Basically, Page 2 of that shows management and company history in your areas of operation. There's a reference in the lower left-hand quadrant to El Vado East. Is that -- does Approach own the oil and gas lease at El Vado East?

A. Yes, we do.

Q. And does Approach have the right to drill on that lease?

A. Yes, we do.

Q. If you would, Mr. Craft, would you give the Hearing Examiner an overview of the geology for El Vado East?

A. I'll be glad to. If you'll turn to Exhibit No. 2, we'll start there. Now, what I'd like to do, Mr. Examiner, if I might stand up and use the bigger stencils?

MR. BROOKS: Yes, sir.

THE WITNESS: And this will be the same for everybody in here. This will be the same map that you see here. They're easier to see when you're up here.

MR. BROOKS: Okay. If you would move the stencil back sort of parallel to the wall here so that the members of the audience will be able to see it as well as the people up here at the front.

THE WITNESS: Sure. Sure. All right. Now, if you look at Exhibit No. 2, what this is, this is an overview of the Chama Basin and the --

MR. BROOKS: If you're going to point to things, you'll need to stand on the other side, because I can't see anything.

THE WITNESS: All right. How about that?

MR. BROOKS: I think that will work.

THE WITNESS: All right. I'll stand back here so everybody can see.

MR. BROOKS: Okay.

A. Now, what drew us to this particular area -- it was a company that managed to secure the mineral rights out here and they brought this to us. We looked at it from a geological standpoint. And what was interesting was the best proximity of our study area to multi-million barrel fields; West Puerto Chiquito, East Puerto Chiquito, Boulder, Verde, all these fields are located right here on the western flank of the -- there's a series of anticlines. Archuleta Anticlinorium is what they call it which is a series of parallel anticlines that form this area. In common terms they call it Hogback.

What happens, you come from the San Juan Basin and then you have these anticline structures that come up. Well, what happens when it comes up, because of the Mancos Shale in the Niobrara member of the Mancos Shale, it's composed of silt, limestone stringers, some very thin silty sand stringers.

Well, all that contributes to brittleness. And when you have brittleness, you have a reservoir for hydrocarbons. Mancos Shale is a source rock. There's no question about it. But without a reservoir, you don't have anything. It has very little porosity or perm inside the shale alone.

So when you look at what's at these fields, the West Puerto Chiquito, East Puerto Chiquito fields right over here, as this structure -- this is coming out of the San Juan Basin which is an incline in the San Juan Basin as you can see right here, as you come off this incline and come back up, you create

a bunch of very long parallel fractures systems. And for fractures, these things are big. I mean, up to a half inch in diameter fracture systems are considered huge. They are almost like pipelines.

So we looked at that and we said, okay, there's one thing going for us. Then what you also have, you have the Chama syncline that comes right through the middle of the acreage, very similar to what you have over here at the San Juan Basin incline. And the Chama syncline live right in the this area right here. And what that is, it sunk. As it comes off this western flank of the syncline, it sinks down and comes back up.

Not only that, but you have a major ridge fault that goes through the middle of this. And this ridge fault reportedly has slippage of up to 10 miles. So you have a lot of tectonic activity taking place which is all good for fracturing, faulting, all that is necessary to hold the reservoir in place and to store hydrocarbons.

And then on the east side of this thing, what you have is a Brazos uplift going into the mountains. So right there you have a perfect environment for fracturing and reservoir storage. Not only that, but on our lease out here, there's been about 10 wells drilled starting in the 1940s. I think they go as high as -- the bulk of them were drilled from the '40s up to the end of the '50s. I think there was one

drilled in the '70s out here. Out of these wells, you have four of them that have actual oil shows reported as they drilled through this member. And I'll show you a map in just a few minutes of that.

MR. BROOKS: That was the Mancos?

THE WITNESS: That was the Mancos, yes, sir.

Q. (By Mr. Hall): You are referring to Exhibit 3 now?

A. This is Exhibit No. 3. Now, what this is -- I'll just -- this is basically a duplication of what I just said, but what this is, is kind of taking a satellite view, the terrain and showing the anticlinorium structure I just referenced to. Our acreage is in the red here. This is Puerto Chiquito over here. Boulder is sitting over here. Puerto Chiquito West, Puerto Chiquito East right here.

So you have this big anticline system that runs through here. You have this Chama syncline that runs this direction. This is the trough of the syncline line, so from this point over, it's going up. From this point over, it's going this way, the Brazos uplift. You have the Brazos uplift right over here and the big unconformity that runs through here, this is your big ridge fall right here. So when you look at it from a reservoir standpoint, this thing has everything it needs to have oil and gas present there.

I want to refer to another slide. Now, this one I

don't have a major map on it. But if you refer to your Exhibit 4 -- and I'll hold it up for everybody to see.

MR. BROOKS: Okay.

A. Now, let's put this map back up real quick.

Q. (By Mr. Hall): Exhibit 4 is your cross section?

A. That's correct. Exhibit 4 is a cross section and here it is. And what you're doing -- I know it's hard for everybody here to see, but the cross section actually goes B to B-prime across this entire area, okay?

Now, when you look at that cross section, this is what the cross section actually looks like. This is the San Juan Basin. The Puerto Chiquito field is located right here. You can see it flexing up. And that's going to be right here.

Then you come across your anticlinal structures, a series of parallel anticlines, as you see them right here, right here, right here -- that's this region. Then you're in the Chama Basin. And you're coming off -- here's your syncline structure right here. That's coming across right through this area. And then and you have the Brazos uplift. The Brazos uplift is this thing.

All these reservoir rocks outcrop in the Brazos uplift. They also outcrop on the far western side of this acreage, too. And that's important. Because when these things outcrop, you can actually go to the rocks and see the members of the Mancos. And you'll see the stain of the rock. You'll

see odor in the rock. Not only this, but a very interesting point -- we have a mine located -- an old mine located in our acreage. I think it's right around here -- right there.

Now, that mine, they did some geochemical testing on that mine on that McAfee Shale. The McAfee Shale is located right on top of the Mancos. Now, what they did, they took the McAfee Shale and they went through and they determined that the thermal maturation of this shale supported oil generation in the oil window. Which basically in common terms is, you turn the oven up, you heat it up, and you're either going to have gas or you can have oil or it can be baked totally out.

Well this particular one supports oil formation. So we have all of this here to work with. When you look at that and look at the different structural features -- again, you go back. This is performed to form fractures, faults, storage vessels for this Mancos Shale Niobrara member. In addition, there's deeper stuff, the Entrada, all the way down to the Dakotas that could be productive.

The big problem out here is basement rock. Where is basement rock? And that dictates a lot of what you're looking at. So whereas in the center of the field, you might find basement rock as deep as 5,000 feet. We don't know yet. As you move over to this side, the basement rock is going to come up, because everything is flexing upward, pushed up. And so that's important to us because that's going to dictate how deep

we drill.

Now, the next one -- let me go to Exhibit --

MR. A. TRUJILLO: Mr. Hearing Examiner, at this point, I'm going to object. I'm not sure if any of these exhibits have been offered into evidence or properly authenticated. I don't know. This is all very interesting, but I don't know where this came from or what the source is or how Mr. Craft has any -- what his basis of knowledge is for these particular exhibits.

MR. BROOKS: Well, Mr. Trujillo -- the -- I know you don't regularly practice here, but we do things a little bit differently as a rule in the OCD than we do in court, and generally speaking, the custom here is to allow a witness to go through his proceeding and then the attorney offers the exhibits in evidence and we deal with those evidentiary issues at the conclusion of the witness' presentation.

The reason we do that is we don't have the question of things that are not ultimately admitted into evidence being exposed to a jury, because we're not dealing with a jury here. So based on that, I'm going to overrule your objection with prejudice to you raising those issues again if and when Mr. Hall offers his exhibits into evidence.

A. Now, there's a lot of literature which we can make -- you can look at it --

Q. (By Mr. Hall): Tell us what you're referring to.

A. Okay. This is one of many papers. I have over 400 technical papers written on the Chama and San Juan Basin in this particular area. This is one written by Benson and Greer Drilling Corporation, Albert Greer. For anybody who wants to know who Albert Greer is, Albert Greer was the one who found West Puerto Chiquito, East Puerto Chiquito. He's kind of the father of the Mancos out here, you might say. Very intelligent man. Did a lot of work, a lot of geochemical work on it, and these papers, if you'd like copies of them, I'll be glad to give them. And they support -- and they will tell you the different authors behind the different structures out here.

Q. Mr. Craft, let me ask you: Did you rely on this paper in conducting your geologic evaluations?

A. Of course. I relied on this and about 400 other pages over there because this basin is so unexplored.

Q. All right. Since you're referring to this one specifically, if you would read into the record the title, author, and where we might find this piece of literature.

A. Okay. You can find this on the geologic website or you can just type in this title, "West Puerto Chiquito USA San Juan Basin New Mexico." It was posted by Albert Greer and Richard Ellis, and it is "Field Classification of the San Juan Basin." That's all you have to do is type that in and this will come up.

Q. Is there a date on that?

A. There is a date. It's very old. Let me find it.

MR. HALL: Mr. Examiner, we didn't intend on tendering this as an exhibit, but we'll certainly make it available to you and Mr. Trujillo.

MR. BROOKS: Are you speaking of the article?

MR. HALL: Yes, sir.

MR. BROOKS: Okay.

MR. HALL: He did rely on it in part, though.

THE WITNESS: I do not see a date handy. I'm sure there is one on here. I don't see a date on here. I see the references.

MR. HALL: That's all right, Mr. Craft. We can get that information.

MR. A. TRUJILLO: Mr. Hearing Examiner, if Mr. Craft would be so kind as to let us know the publisher and the journal name of that report?

THE WITNESS: The publisher.

MR. BROOKS: Is that information on there?

THE WITNESS: I don't think so.

MR. A. TRUJILLO: What about the journal name?

THE WITNESS: The journal name is not on here. This was written as an independent basis -- independent report, I believe. But let me -- I can look through it and figure out where it is. Hang on. It's got to be in here somewhere.

MR. HALL: We'll certainly be glad to make a copy

available to counsel.

Q. (By Mr. Hall): Let's go on, Mr. Craft.

A. Okay.

Q. Did you rely in part on Mr. Greer's article in your geologic evaluation?

A. Yes, I did.

Q. Tell us, is there something in particular in there that you would like to --

A. Okay. Well, let me skip over something just real quick. And we'll just skip -- let's go to this one. This is Exhibit No. 5. Now, one of the reasons that I looked at that paper and took notes was this was the field -- the field was actually discovered in 1960, I believe. Actually, West Puerto Chiquito was established in '62. East Puerto Chiquito was established in 1960, I believe.

Well, one thing that Greer kept referencing through the write up and in his conclusions, which you all will see -- and here's the field I'm talking about right here, they were overdrilled. These fields were drilled initially on 80s, 160s, and because of the nature of the fracture system out here --

MR. BROOKS: Now, you're referring to Exhibit 5?

THE WITNESS: Exhibit 5.

MR. BROOKS: And the area that you're saying that's been drilled is on the left-hand side?

THE WITNESS: On the left-hand side right over here

at these two arrows.

MR. BROOKS: Okay. Go ahead.

A. Okay. Now, one thing that the paper described is the overdrilling and the waste of reserves, the waste of land, by drilling these on 40-acre spacing, on 80-acre spacing, on 160-acre spacing. The reason for this, because these facture systems are very long parallel fracture systems, and when you find the fracture swarms that you need to be in and the parallel fracture systems, one well will drain a large area, up to 640. He recommends drilling on 640-acre spacing in his -- after he looked at the whole thing.

He also recommends, because East Puerto Chiquito was developed in a competitive land situation, the spacing was not controllable because you had different oil companies competing for reserves. He recommends also that to keep this Mancos development in this particular area is going to be secure a large acreage position. If you secure a large acreage position, you basically take out the competitive nature of the reservoir. You're in control.

So I looked at that and I said, you know, that's going to help from the standpoint from drilling, recovery per well and what we have to do when we're in here. So we're going to look at that and take the same type of thought process when we start drilling these wells out here.

Now, the last thing now -- this is -- we're going

back. This is part of your Exhibit 1. This is actually the third page of your Exhibit 1.

MR. BROOKS: Okay.

A. This is kind of interesting. This is why basically -- why we elected to explore -- and this is an exploration project, by the way.

Q. (By Mr. Hall): Let me ask you a question. What are we looking at here? What are the boundaries shown here?

A. This is our acreage position, our 90,000 acreage as highlighted in yellow here.

Q. Okay.

A. And what you have, this is El Vado Reservoir.

MR. BROOKS: Hold on a minute. Let me clarify. Everything in yellow is your acreage position or the darker color?

THE WITNESS: Everything in yellow is our acreage position here.

MR. BROOKS: On my copy of the exhibit there is that in darker colors. That doesn't appear to be the case on the one on the board.

THE WITNESS: That is correct. That is a map that I referenced to. What you are looking at is lease holdings inside our acreage position. So let's just look at this one.

MR. BROOKS: Okay.

THE WITNESS: And we'll enter that one.

MR. BROOKS: I would also note that the writing that's inside the various blocks on my copy of the exhibit is totally illegible.

THE WITNESS: It's totally unreadable. Exactly.

MR. BROOKS: Hopefully it has no significance.

THE WITNESS: Not for what I'm presenting here.

MR. BROOKS: Okay. You may proceed.

A. This is our acreage. Remember I said there were old wells drilled out here. And what we have done, we have marked the wells. You can see them, tin building, tin building, this is the Hamilton State right here. You move up here, you have the Martinez. You move up, tin building, Tierra, TA-A1 and El Vado 1 here.

MR. BROOKS: By what kind of symbols are the old wells marked?

THE WITNESS: The old wells are going to be marked as dry hole symbols.

MR. A. TRUJILLO: Excuse me. I didn't catch that.

THE WITNESS: Dry hole symbols are a circle with a plus sign through the middle of it.

MR. BROOKS: And these are in blue on my copy, anyway; is that correct?

THE WITNESS: These are --

MR. BROOKS: No. We got one dry hole symbol that's in red.

THE WITNESS: These dry hole symbols should be in red here.

MR. BROOKS: Most of them appear to be blue on my copy, although the ones way over on the left are in red.

THE WITNESS: Let's see.

MR. BROOKS: The ones on -- there are three out on the left side that are in red. All the rest of them seem to be blue.

THE WITNESS: Okay.

MR. BROOKS: Some over there on the right are in red, too. I don't know if that has any significance.

THE WITNESS: Well, go to Exhibit No. 7.

MR. BROOKS: Exhibit No. 7?

THE WITNESS: And maybe we can take some of that clutter off of there.

MR. BROOKS: Okay.

THE WITNESS: It's still hard to read on the map, but on this, the red line, is our acreage position. As you can see the red line and we didn't do the yellow in here. Also, it's hard to see, but you can see the dry hole symbols on the acreage position as we go through. So everybody can see it --

MR. A. TRUJILLO: Mr. Hearing Examiner, could Mr. Craft let us know how many there are so we don't --

THE WITNESS: Yeah. There's 10 dry holes on the acreage. There's about 18 wells surrounding, including in the

acreage, but there's actually 10 on the acreage.

Q. (By Mr. Hall): You mean the lease acreage?

A. On the lease acreage.

Q. Okay. Go ahead.

A. And you can't see it on this mapping. That's why you're going to have to look at this map. On here we've colored with a green color the wells that had shows in it. And I'll point that out to your guys in a minute.

But here's the wells. Here they are. They're right here, right here, right here, right here. And we have three right here, and we have four right here.

MR. BROOKS: That may well explain the color difference that I was looking at, what I was characterizing as blue may be green.

Q. (By Mr. Hall): If you would show the Hearing Examiner as well, that would be helpful.

A. Okay. Here's the well, you see one, two, three, four?

MR. BROOKS: Well, yeah. Would you mark them on my copy -- well, mark them on the copy that's going to be put in evidence. Take the court reporter's copy over there and mark them on there, please. That way we'll have a record.

MR. HALL: Mr. Examiner, would it be helpful to you to have the PowerPoint slides displayed on the screen? I'm pretty sure this is not a function of our AGI site, but, we

would be glad to do that.

MR. BROOKS: Actually, I can see them fairly well from here. But if it's feasible to display them on the screen, that would probably help members of the audience substantially.

MR. A. TRUJILLO: Mr. Hearing Examiner, I did contact the Information Technology, Martin, and I told him we would be use a PowerPoint sometime today. And I'm sure if someone would run over and let him know, he could set it up in a matter of minutes. He did on Friday.

MR. BROOKS: Okay. If you could work on it while we're proceeding, that will avoid wasting time.

MR. HALL: Okay.

MR. BROOKS: Thank you. I appreciate it. Here you go.

THE WITNESS: We have the show wells, show wells, here's the different wells we've marked.

MR. BROOKS: Okay. The record will reflect that the witness circled the wells having shows on the Exhibit 7.

A. But one reason why we focused over here instead of over here, you have a lot --

MR. BROOKS: Now, because we're making a written record, I'm going to ask you rather than saying "here," say toward the right-hand side or toward the left-hand side. That way it'll make more sense to somebody reading it.

A. Okay. On the east side of our lease, before you

get into this separation piece right here, the reason we are looking on the east side is we have a couple of things of interest. We have some wells down here that we actually have logs on that are old, old wells. We have this Estabel Well right here, which is not located on your lease block, but just adjacent to it.

MR. BROOKS: That's to the east end of your large lease block.

THE WITNESS: That's right. These are in the large lease block. This Estabel Well, when they drilled into it with fluids and lost a lot of returns. They had total loss returns which supports fracturing. So when we started looking in this particular area we said, well, it makes sense because what happens with the Brazos uplift coming up like this, these beds are pretty steep here. You've got a lot of flexing here and so it makes sense that you can get these long parallel fractures at this point. And that's why we focused in this particular region on and over here first.

You have the same thing occurring on the far west side of our acreage position where it comes up to the eastern flank of this system. It's not as steep as it goes up. We did have some shows here on both these wells on the far west side of our acreage position, but we're going to initially try to focus here where we think we should have the bigger fracture systems.

Eventually -- and this is -- like I said, this is an exploration project. We're going to have to go in and do some drilling, find out what it is -- and as we go through, it's a work in progress. We're going to hydrate locations. We're going to look back. Some locations we have right now might fall out depending on what our geology indicates. But the whole reason for what we're doing right now is number one, is centered off of geology.

Q. (By Mr. Hall): Mr. Craft, let me ask you: In that regard, are your well locations sensitive to the available geology, then.

A. They are at this stage. Very much so.

Q. For drilling trendology, as they say; is that right?

A. That's exactly right. That's why it's exploration. We're drilling trendology. And this is an exploration project, even though we have some control over here and we have some control over here, it's still exploration.

Q. The well data that you've utilized for the older wells there, is that data available from the -- publically available?

A. Yes. The data is all publically available. We got ours from Dwight's PHD. You can get online with Dwight's. You have to have a subscription for it. But you can probably go into the OCD records and get the same information.

Q. All right. Go ahead.

A. Well, the last piece I want to show -- and we've already looked at this piece -- is just -- we'll refer back to El Vado East regional production. And over here --

MR. BROOKS: And which exhibit is this?

THE WITNESS: That's going to be back at Exhibit -- I think it's 7. No, it's 6 -- Exhibit 5, okay?

MR. BROOKS: Okay.

A. Now, what this is, this just gives you a 30,000-foot view of the region. And what you have here, this is more of the TA area up in this area. And you can see there's a tremendous volume of wells -- not tremendous -- but there's a large number of wells that we are drilling up in this region. You have different producing fields.

MR. BROOKS: Are you talking about the region toward the north end of the nap?

THE WITNESS: Right. We're going up into the very northwestern end of the map, as you can see here. And this little field over here is called Chromo. As you come down -- coming down to the far west side of the lease position, you come down about a little more than half way and you have the Boulder Field, Boulder/Mancos Field over here -- right here.

Then you come down and you have the Puerto Chiquito Fields. And that's in the very lower corner on the left side of this map, or in the western region of the --

MR. BROOKS: All those fields are along the left-hand side.

THE WITNESS: That's correct. Right up against that incline structure pushing up out of the San Juan Basin. There has been some wells drilled, as you can see. There has been a very limited number of wells drilled on this acreage position, but there has been some.

You also have some production just immediately offsetting our acreage position right over on the west side.

MR. BROOKS: The red outline on the bottom of this map that's Exhibit 5; is that your acreage position, again?

THE WITNESS: That is our acreage position with the exception of this one -- I think one issue here. This is an older map. This comes down. We do not have this piece. And as we showed on this map -- let me show you all -- this little piece right here as it comes down and drops to the south, we don't have that as depicted by this map.

MR. BROOKS: Okay.

THE WITNESS: Okay? Right here.

MR. BROOKS: That map being Exhibit 7.

THE WITNESS: Right. And that is basically the geology that we use to explore -- or we're going to use to explore in this particular region.

Q. (By Mr. Hall): Mr. Craft, based on the analogous reservoir data from the Puerto Chiquito and the Boulder Fields,

is there sufficient data that allows you to project your EURs for these wells?

A. Well, always we like to use geology. And if you refer back to --

MR. BROOKS: For the benefit of members of the audience who may not be into oil and gas terminology, EUR is Expected Ultimate Recovery.

MR. HALL: I beg your pardon.

THE WITNESS: Yeah, sorry.

A. If you turn to Exhibit 1 and come back about on the fourth page -- and I apologize for this being off -- and I'll show this to everybody. This is Puerto Chiquito East Field and Puerto Chiquito East Field. There was probably close to 60 wells at one time in the field. And if you look at it from a cum basis, this cum is almost five million barrels out of this field. Now, from the EUR, using EUR projections off of existing old fields is a good ballpark number. You can get close to it. But it's not exact science.

But if you look at recovery per well EUR you've projected out, you're looking at somewhere around 100,000 barrels a well. Now, that's averaging the poor wells with the mediocre wells with the better wells. That's more of a statistical model we use.

If you go to Puerto Chiquito West Field -- and let me remind you of Puerto Chiquito West Field, too, this field is a

stellar field. This field is almost --

Q. (By Mr. Hall): You're referring to Page 5 of Exhibit 1?

A. Page 5 of Exhibit 1 titled Puerto Chiquito West Field. This field has, right now, has a cum of somewhere around 17 million barrels. And now, this field is a little bit different in that this field is deeper on the structure on the west side so you have some associated gas with this field. And if you do an MBO or MMcfe, however you want to look at it, but it'll get you around 20 million barrels.

Now, if you look at the average per well in this field because of increased recovery and less wells drilled on this field, it's about 285,000 barrels per well on the average. Now, the interesting thing about this field is, this field, as I said, it's a deeper structure. It's about -- it ranges from 4,000 feet down to 7,000 feet on the structure. Well, the East Puerto Chiquito ranges from 2,000 feet down to about 93,000 feet as it dips down the structure. And Boulder's around 2 to 3 as well. So there's all up in the same what I call zip code as far as depth. About the same as what we're looking at over on our side of the eastern flank of our field.

Now, if you go back -- and also, what they did in the Puerto Chiquito West Field, because it had some solution gas with it -- and one thing about these fields, you have to have -- this is all for the most part excluding -- I know it

gets confusing when I say this -- excluding Puerto Chiquito because it does have some solution gas with it -- when you get on these fields that have very little gas, such as Boulder, East Puerto Chiquito, those fields are all based on gravity drainage. So you have to have a low spot, a collection point, gravity drainage and a storage capacity in it.

If you go to the next page which will be Page 6 right behind it, it's titled Boulder Field Production Summary. This field is a small field, somewhere around 2.8 million barrels. EUR per well somewhere around 88,000 barrels per well. But it's up shallow. It's up at the 2,000 foot mark.

Q. Let me ask you, Mr. Craft, I noticed on Exhibits 4, 5 and 6, the data is off the charts, so to speak, on the left side. It goes back to 1970. Was there production predating --

A. That's true. Dwight's went back -- Dwight's is the software we use, the proprietary software, which you have to have a membership to, and they don't record anything beyond the '70s in this particular area.

Q. Does that mean, in fact, some of the cums may be higher than reflected?

A. It's possible. It's hard to get data back in the '50s and the '60s. It's hard to get the data and really be able to quantify it. So most of this information I was talking about is cum stuff, that's based on the '70s forward. Now,

they -- went back -- Dwight's went back -- and they looked at cum numbers too, pulling records and things like that to try to get the exact volumes, but there could be some errors from the '70s back.

Q. Okay. Go ahead.

A. Well, that is basically the geological model.

Q. Okay. We asked you, Mr. Craft, based on a reasonable scientific probability, is there a reasonable expectation that you will realize production from your drilling project?

A. Oh, I think there is a reasonable expectation. The key on this is shows. We actually have some shows from the Mancos Shale that were recorded back in the '50s, early '60s. Some reports are even bailing oil out of the well. At that time, oil was not trading very high, so these wells, when they drilled these wells, they just got a show. It didn't mean anything to them. But with the technology we have now and with the advancements in completion processes, a show can mean a whole lot.

Actually, on the East Puerto Chiquito Field, the geological team that was in charge of finding that field first thought -- when they first drilled the first four wells -- that there wasn't anything else there. And then they went back and looked at it and started working it and they realized that their model was incorrect, so they changed their model.

One well, actually the largest well in Puerto Chiquito West Field, when they drilled in it, they got no shows. They went and did a big frac job on it where they pumped sand and opened these fracture systems up, and the well has cumed almost a million barrels of oil.

Q. You were present for the -- let me ask you it this way: None of your proposed locations are within one mile of an established pool or undesignated pool; is that correct?

A. That's correct.

Q. So these are all wildcat locations?

A. Yeah. And they're exploration locations, wildcat locations, exactly.

Q. It's based on statewide rules and 40-acre spacing?

A. The deal with the 40-acre spacing is -- because we think in the window, oil generation window we're in, and at these depths -- because remember, this is above sea level. These reservoirs are all above sea level. We think that the probability of having a gas solution, gas portion of this reserves is probably nil. So it's going to be oil.

Now, the state rules for New Mexico, 40 acres oil, is 40 acres. Am I planning on developing this on 40-acre spacing? No. Not at this point. It's going to be a combination of two things. We're first going to have to get in and see what we have. We're going to have to do some proper core work, measure

these fracture systems as we get into them, and see the drainage of these fracture systems which requires doing some reservoir analysis on it. That's going to be more -- that will dictate our next step.

But the literature that we have available to us would suggest -- and it makes sense if you think about it -- you're dealing with long parallel fracture systems that are fairly large in nature that it would not be wise to drill this on close spacing. I mean, why? You can recovery the same amount of reserves from drilling it on maybe 320s or 640s, whatever the reservoir tells you.

Q. And again, do you know what the spacing is under the Puerto Chiquito pools? Are there special pool rules?

A. The Puerto Chiquito Field, they applied for 320 with optional 640s -- or 640s with optional 320s. It was smaller. At the end they were drilling it on 640-acre spacing.

Q. And by virtue of the earlier development density, did the Division make the decision to establish a buffer zone around those pools?

A. They did. Actually, it was a unique occurrence. Because when Mr. Greer first got his West Puerto Chiquito Field on, he applied for a pooling -- or a unitization of over 70,000 acres, which at that time, it was unheard of. And they granted it to him because he was showing the fact that these wells do not need to be drilled on 40s, or close spacing. These wells

need to be drilled further apart because it's a waste of money. It's a waste of reserves, especially when you have a solution gas drive in combination with gravity drainage on this field. So what he did on this field, he tried to get the spacing as large as he could and then he reinjected the gas back into this field.

Now, you do that for two reasons: Pressure maintenance to move oil out of it. And then at the end, he blew the gas cap down and sold the gas.

Q. Do you know enough now about what you expect to encounter on your lease to say whether pressure maintenance may be necessary?

A. Well, if it's oil reservoir, for example, if there's any produced water associated with the Mancos in this particular case -- and one thing I want to point out, the produced water is fresh out here. And in these other fields, for the most part, it's been fresh or very low salinity ratios in it -- that the water would be reinjected back into the fracture systems to use as a washing type deal or as a quasi poor-boy flood. That way you recover as much oil as possible.

But we won't know that until we do some reservoir studies on it and we actually get some data on it. And that's one thing that's going to have a lot to do with the API gravity that's accrued. We're believing this is going to be in the 35 API gravity range, which is a nice gravity accrued to have.

We're going to have to find out if there's any associated gas with this, which we don't think there will be based on the elevation of where these reservoirs are going to be. We very seriously doubt that there is any associated gas with it.

And a lot of things are going to take place. This is a learning process for us. I mean, this is wildcat. We don't have a lot of information out here. We do have some old control wells, and that's about it. And so, you know, every well we drill is going to be a new data point. And the first well is going to be very important to us.

Q. Do we have enough information now to predict what our post-drilling production facilities might look like?

A. Well, at this point -- let's just say we assume that we are not going to have any solution gas with this and it's just going to be plain old gravity drainage system. Which gravity drainage will necessitate a pumping unit because it doesn't have any drive mechanism. It's not a water drive. It's not a solution gas drive. This oil is just sitting in these fracture systems.

And so we'll have to put a pumping unit, a small pumping unit, on it. They're not very big at this depth. And then we'll have a storage facility to store the oil in. Most likely this will be on individual locations. I don't think there's enough information to say we're going to do a central facility out here. Plus, the terrain makes it very difficult

to do central facilities because then at that point you have to build pipelines and there's scar off the pipelines. So we're looking at probably just a well site storage facility.

Q. All right. Mr. Craft, do you have an opinion whether or not these wells can be drilled in an environmentally sensitive manner?

A. Yeah. I think they can. I mean, there's been tremendous work done, especially here recently and justifiable so, too, on getting the oil and gas sector to do a better job of drilling and reclamation of ground, which I applaud them for it. The OCD -- I applaud the OCD for the closed pit system. I think that's a fabulous idea. It does minimize the amount of contaminants that you're going to get out. I think with our process and based on the other areas we drill in, there's ways you can minimize any type of damage. Can I guarantee it? No.

Q. Let's talk about correlative rights briefly: Are any of your locations closer than 330 feet to a lease boundary?

A. I do not believe so.

Q. And Approach owns or controls 100 percent of the lease hold working interest?

A. That is correct. Well, yes. We control 100 percent.

Q. Okay. If Approach is prevented from accessing these projected reserves, in your opinion, will waste result?

A. Yes. Reserves will remain in the ground.

Q. Let's talk about your lease briefly. Do you have a drilling obligation under your lease?

A. Yes, I do. Part of this lease process, we had a -- it was a little bit unconventional as far as we didn't have our standard three year, five year lease terms on this. And part of our negotiation with the previous owner of these minerals was to drill eight wells in a period of two, two and a half years, with one well going down to the basement rock.

Right now we're kind of behind the eight ball because the term of this -- I'm not sure exactly when it terminates, but there's probably -- I'm not sure of the date, but there's a short period of time left on it.

Q. All right.

MR. BROOKS: I assume you're going to offer us evidence of that date, Mr. Hall, at some point.

MR. HALL: I would be glad to get you the lease itself, Mr. Examiner. We will do that.

MR. BROOKS: Okay. Thank you.

MR. HALL: I believe you already have it, as a matter of fact.

MR. BROOKS: We probably do. I have not seen it, but it's probably in our file.

Q. (By Mr. Hall): Does April 2009, sound correct?

A. That's it.

Q. Okay.

A. Thank you.

Q. Are you requesting that the Division issue an expedited order in this case to allow you to proceed with drilling?

A. Yes. We have several factors that support the need to go ahead and get started, weather-related issues, once it gets wintertime out here, we cannot drill out here. Nor do we want to drill in the wintertime. So we have that issue. We also are sitting on the record oil prices right now, which makes us want to get in and drill this as soon as we can to find out if in fact, there is something out there.

MR. HALL: That concludes my direct of the witness, Mr. Examiner.

At this point, I would offer Exhibits 1, 2, 3, 4, 5, and 7. Let me ask the witness about those, briefly.

Q. (By Mr. Hall): Mr. Craft, were Exhibits 1, 2, 3, 4, 5 and 7 created by you or at your direction and control? Did you participate in the creation of those exhibits?

A. I participated. They were actually created by our geologist, and I oversaw the creation of the documents, actually.

MR. HALL: We move the admission of those exhibits, Mr. Examiner.

MR. BROOKS: Which exhibits are you moving the admission of, specifically?

MR. HALL: 1, 2, 3, 4, 5 and 7.

MR. BROOKS: 1 through 5 and 7. Any objection?

MR. A. TRUJILLO: Yes, Mr. Hearing Examiner. I would ask Mr. Craft to explain the source of the information on most of these documents in terms of where they came from, where the information was compiled from, especially on some of these maps before I withdraw any objection to their admission.

MR. HALL: If you could explain that, Mr. Craft. Would you address that, please?

THE WITNESS: Oh, the information on the maps came from both --

MR. A. TRUJILLO: Mr. Craft, would you go one by one?

THE WITNESS: Yeah. Where do you want to start?

MR. A. TRUJILLO: Exhibit 1 will be fine.

MR. HALL: Exhibit 1 in the notebook?

THE WITNESS: Okay. All right. This page you're looking at.

MR. A. TRUJILLO: Yes.

MR. HALL: You're preferring to Page 2?

THE WITNESS: Page 2, right. The information on this is complied -- actually, I did the actual reserves on this. Those are my numbers. So I'm intimately involved in the reserves of 180.4 Bcfe approved reserves overall.

MR. BROOKS: Which page are you on?

THE WITNESS: Page 2.

MR. BROOKS: Okay.

THE WITNESS: Let's just go down from portfolio highlights. We'll go down right underneath to Boomerang. That's our New Albany Shale project. I was the one that developed the New Albany Shale project here, 74,000 acres. And that's New Albany Shale similar to the Mancos Shale. It's located around 1500 feet of depth in very southwestern Kentucky. We currently have three wells drilled in that and I have development plans once we frac the wells.

North Bald Prairie, our East Texas project, we took that lease. It's a joint venture from EnCana. We took that July of 2007. Under the joint venture agreement, we had to drill five wells and carry EnCana 50 percent for the first five wells to earn a 50 percent interest in that lease. We're currently drilling Well No. 8.

Ozona Northeast Canyon Sands was a farmout from an oil and gas operator in Dallas. It covered 44,000 acres. We took the farmout and early of 2004, January, we drove a first well in that field, which is the Canyon Sand Field, pluvial deposit, deep water sands. We drilled the first well February, 2004. We built a 65-mile gathering system. Our first day of production was May 7th, 2004. We have since drilled over 300 wells in that field with a 95 percent success rate.

Moving on to the Cinco Terry. Cinco Terry was a continuation of the Ozona Northeast Field. Cinco Terry is

Wolfcamp, Canyon Sands and Ellenburger. One thing I failed to tell you on Ozona Northeast, part of that farmout only gave us depths down to the top of the Strawn Lime. The Canyon Sands sits immediately on top of the Strawn Lime. From the Strawn Lime you go into the Ellenburger. That's going to be important in the Cinco Terry.

The Cinco Terry project is located about two-and-a-half miles to the west of Ozona Northeast project. We have roughly 31,380 acres. On that, we're talking shallow Wolfcamp, sprayberry or if you want to call it wolfberry for short. We're also targeting the Canyon Sands and then we're targeting the deeper Ellenburger Sands.

MR. BROOKS: I maybe a little late interjecting here, but I don't believe we're too interested in the details of the matters that are not relevant to this proceedings.

MR. A. TRUJILLO: I have no objection this page. In terms of the maps of these proposed locations and some of these exhibits that Mr. Craft has introduced, I would like to know specifically -- what exhibit number is this?

THE WITNESS: This one?

MR. A. TRUJILLO: Is that No. 3? What's the source of that?

MR. BROOKS: I believe it's No. 4. No -- it's No. 3. You're right.

MR. A. TRUJILLO: I'd like to know the source of the

information for that exhibit before I withdraw any objection to it.

THE WITNESS: Okay. The source of the information on this is -- there's a lot of.

MR. A. TRUJILLO: Just the source.

THE WITNESS: I know, but you're asking the source. This is just a snapshot of our study area right here. So the source is -- this is the geology of the San Juan Basin. This is in any geological reference you want to go to, they show it. We have copies of them over there.

There are several authors that have written this. And this one, in particular was written by a guy by the name of Cather in 2004. And this is where he basically broke out the different members of the San Juan Basin showing the different tectonic activities that occurred in the San Juan and the Chama Basin.

MR. A. TRUJILLO: No objection.

MR. BROOKS: Okay. That was Exhibit No. 2.

THE WITNESS: That was Exhibit No. 2.

MR. BROOKS: Okay. Now, a question was asked about Exhibit No. 3.

THE WITNESS: Right. And Exhibit No. 3, what I was saying is this is our study area. We took this big map that was developed by this gentleman, Cather, in 2004. And basically what this red area is -- then we took our area which

is in this portion of this area and study block which represents what you see right there.

MR. BROOKS: And that's from the same source?

THE WITNESS: That's from the same source.

MR. BROOKS: Okay. Continue.

MR. A. TRUJILLO: Now, I believe Exhibit 4, which is the cross section.

THE WITNESS: Right. This cross section was from some literature that went across the whole area from Grant Foster in 1989 -- an article written by Grant Foster. He actually did this cross section representing the San Juan Basin going into the Chama Basin.

MR. A. TRUJILLO: No objection. Exhibit No.5?

THE WITNESS: Exhibit 5? Okay. This was put together -- all we did was take published information, which all these wells are published information. You can go to the New Mexico Oil and Gas Association or any of their reporting processes out here and you can get these wells. You can Google it in, type it in, or go to Dwight's. All our stuff came off of Dwight's. These fields are public record. That's where these came from. We're just showing the relationships and showing that there is activity in our area.

This is our lease outline. This was done by our land department. As I said, with the only exception of this piece right here.

MR. A. TRUJILLO: No objection. No. 7?

THE WITNESS: No. 7? Okay. No. 7, I'll use this for right now because it's a lot easier than pointing to the little map, if that's all right.

What we did here, we had our land department go out, using Dwight's data, and find the different wells -- any well within a certain area of our lease, a certain distance from our lease, whether it be a mile, two miles or three miles. We were just trying to get what is taking place in this region.

Then we downloaded the individual well records from these -- which we have -- and it shows how far they drilled, where they set pipe, what era drilling it was, whether it was a 1940 or 1950, the type of fluids that were used, and if they had any reasonable show. And that's where you put this on the map.

MR. A. TRUJILLO: I am going to object to this, Mr. Hearing Examiner, unless Mr. Craft can establish the method by which the boundaries of the property were determined, whether it be survey or whether -- I'm not sure if I'm ready to admit that, unless that can be established.

MR. HALL: Mr. Examiner, I believe he testified the data came from Approach's land department.

MR. BROOKS: Yeah. I'm going to overrule the objection. If there is a specific issue with regard to a particular boundary, that would be something else again, but I

don't believe that's likely to occur in this case since we're not dealing with title issues in this forum.

Does that cover all the exhibits that were offered?

MR. HALL: Mr. Examiner, we still have Exhibit No. 1. And let me do this: Mr. Craft --

MR. BROOKS: Well, I don't -- did you have any objections to Exhibit 1, Mr. Trujillo?

MR. A. TRUJILLO: Well, not to -- well, there are portions that were not entered or were not -- the proper foundation was not laid by Mr. Craft. It's a lengthy exhibit with about seven or eight pages -- 15 pages that I can count. And I believe Mr. Hall only dealt with three.

MR. HALL: Mr. Examiner, let's do this: Mr. Craft discussed Pages 1 through -- I'm sorry. Pages 2 through 6 of Exhibit 1.

MR. BROOKS: Pages 7 through 16 have not been discussed. Are you offering --

MR. HALL: That will come through another witness.

MR. BROOKS: Okay. Then do you want to limit your offer at this time, Mr. Hall?

MR. HALL: Yes. To Pages 2 through 6 of Exhibit 1.

MR. A. TRUJILLO: No objection.

MR. BROOKS: Okay. Page 2 through 6 of Exhibit 1. Exhibits 2, 3, 4, 5 -- there is no 6 -- 2, 3, 4, 5 and 7.

THE WITNESS: 6 are the large maps.

MR. BROOKS: It's not been offered, though?

MR. HALL: Yes, it has.

MR. BROOKS: It has been? What is Exhibit 6?

THE WITNESS: Exhibit 6 is all these large maps, just the blown-up versions from the book.

MR. BROOKS: So Exhibit 6 is something that is also contained in the other exhibits? Now, I haven't seen Exhibit 6.

MR. HALL: Sorry for confusion. You recall that with respect to the lease boundary map, we had some --

MR. BROOKS: And the one he's holding up is Exhibit No. 2.

MR. HALL: That's correct. If you will look at Exhibit 7 in the notebook.

MR. BROOKS: Okay.

MR. HALL: Those gaps in the lease and the color of the subcomponents of the lease differed from the poster board.

MR. BROOKS: Okay.

MR. HALL: I wanted to get that in.

MR. BROOKS: The poster board is, then, what exhibit?

MR. HALL: That will be Exhibit 6.

MR. BROOKS: Okay. So that poster board will be Exhibit 6.

MR. A. TRUJILLO: It's marked 7.

MR. BROOKS: Yeah. It's Exhibit 7 in here. We'll

need to get a reduced copy of it because we don't have --

MR. A. TRUJILLO: I see. So this is the 6 --

THE WITNESS: Right.

MR. A. TRUJILLO: -- and this is -- No. 7 is this, but reduced?

THE WITNESS: Yeah. What No. 7 is -- what you have there doesn't show this piece right here.

MR. BROOKS: Okay. Pages 1 through 6, of Exhibit 1 are admitted. And Exhibit 2 through 7 are admitted.

[Respondent's Exhibits 1 (Pages 1 through 6) and 2 through 7 admitted into evidence.]

MR. HALL: That concludes my direct of this witness.

MR. BROOKS: Let's take a recess until 1:30.

[Recess taken from 12:13 p.m. to 1:32 p.m. and testimony continued as follows.]

MR. BROOKS: We'll go back on the record. And I believe you had passed the witness, Mr. Hall?

MR. HALL: Yes, sir.

MR. BROOKS: Okay. Mr. Trujillo, you may cross-examine.

CROSS-EXAMINATION

BY MR. A. TRUJILLO:

Q. Good afternoon, Mr. Craft. You know, this morning you gave us a very detailed analysis of geological formations and features regarding oil availability and

production, but you gave us absolutely no analysis on the hydrological situation that's present here, did you?

A. No.

Q. And, you know, you're in the same water formation -- you're in the same formation as a water aquifer, are you not?

A. Aquifer might be there, but no.

Q. Well you heard Mr. Finch's testimony, did you not? You saw Mr. Finch's exhibit that folks have wells 2,000 feet down there in this area, don't they?

A. I heard what he said. I don't know if they have wells 2,000 feet there.

Q. Well, you saw the reports, didn't you?

A. I saw the reports.

Q. Okay.

A. The key is if you have water down there, then you won't have any oil down there that's been breached.

Q. I'm not sure if I agree with you, but if you have to frac to make this work, then you can't guarantee that you won't contaminate those water aquifers that are down there, can you?

A. If we have to frac it, we have reasonable methods that we can use to predict the frac stress profile, thus tell you how high you're going to get or how low you're going to get.

Q. But like I said, you can't guarantee that you won't contaminate the water aquifers.

A. I can't guarantee anything like that.

Q. You testified that you have a drilling obligation under your lease.

A. Right.

Q. And you do have a forced mature clause in that lease; is that correct?

A. That's correct.

Q. And that forced mature clause would extend the life of your lease until any governmental delays have been removed; is that right?

A. No. That's wrong.

Q. Are you sure?

A. Yes. It's for four years.

Q. So it would be extended?

A. It would extend that from the primary -- where the lease ends in April 2009, it would extend for four years max --

Q. Right.

A. Which at that time, then we have 60 days once it's terminated -- once the four years is over -- to complete our obligation.

Q. Right. And you have triggered that extension clause; have you not?

A. I'm not sure we have. That would be something that we need to ask the land department. I'm not sure if we have triggered it or not.

Q. But you are president of this corporation; is that right?

MR. HALL: I'm going to object to the question as being outside the scope of the direct. We did not get into --

MR. A. TRUJILLO: I believe that Mr. Craft testified that they have a lease obligation to drill by April 2009, that this is essential for them. To do otherwise, they might lose the terms of the lease.

MR. BROOKS: That's true. I'll overrule the objection.

Q. (By Mr. A. Trujillo): So that extension clause has been triggered?

A. I'm not sure if it has. I'm not sure. Our land department is the one that would be working on that. I know we talked about it, but I'm not sure if it's officially been triggered or not.

Q. So you never saw a letter from Curtis Henderson to the leaseholders indicating that they wanted to trigger that lease extension?

A. I saw a draft of the letter, but as far as has it been sent? I don't know.

Q. So you don't know if it's been sent?

A. I don't know.

Q. Okay. Yet, you're still asking this court -- excuse me -- Mr. Hearing Examiner of the OCD, you're asking the OCD for an expedited order; is that correct?

A. That's correct.

Q. But even if you get an expedited order, you still have to comply with the County's ordinances, right?

A. That's correct.

Q. Okay. Now, I'd like you to turn to your Exhibit No -- let's just start with 8A, and 4 or 5 pages back, you'll see a form C-144.

A. Okay. Got it.

Q. And right below the instructions, "Please submit one application per individual pit, closed-loop system," it says:

"Pleased be advised that approval of this request does not relieve the operator of liability should operations result in pollution of surface water, groundwater, or the environment."

Did I say that right?

MR. HALL: Mr. Examiner, let me interpose an objection at this point. This evidence -- this exhibit is not in evidence at this time. This exhibit was not discussed and this is beyond the scope of direct.

MR. BROOKS: Well, that is true. But I, on the basis

that we talked about, that we can examine about exhibits not in evidence, well, I wouldn't have a problem with that. I do, though, believe this is outside of the scope of direct, Mr. Trujillo.

MR. A. TRUJILLO: I'll withdraw the question.

Q. (By Mr. A. Trujillo): Now, Mr. Craft, you testified that you have a lot of experience in dealing with very sensitive ecological sensitive areas; is that correct?

A. Uh-huh.

Q. But accidents do happen; do they not?

A. That's correct.

Q. Contamination does happen?

A. That's correct.

Q. And it happens to Approach?

A. It has in the past.

Q. Okay. Why don't you tell us Approach's record in drilling in environmentally sensitive areas?

A. Well, I would say we have had 10 instances with Approach, and I think it would be proper for Glenn to answer that since he's directly in charge of the cleanup and operations of these spills.

MR. A. TRUJILLO: No further questions.

MR. BROOKS: Okay. Mr. -- I'm sorry. I've forgotten your name.

THE WITNESS: Craft.

MR. BROOKS: Mr. Craft? Okay.

EXAMINATION

BY MR. BROOKS:

Q. Mr. Craft, I just have a few questions. And I want to be sure and enter in the log here so I don't charge my questioning time against either of the parties.

You said some of the wells that had been drilled here indicated that they had substantial fluid losses?

A. One well that I had record on had substantial fluid loss. That's how the report references it. It was drilled in the '50s.

Q. Was there anything in the report to tell you where that fluid was?

A. It was in the Mancos Shale.

Q. Okay. I don't know too much about the San Juan Basin area. Most of what I do know is about southeast New Mexico and the Permian Basin. Of course, there we're dealing with the salts and highly saline fluid and we get real concerned about where something is going. If you have fluid loss, it's from an environmental standpoint. Is there any reason to be concerned about that in this situation, about pollution of fresh water?

A. Well, the theory of loss of circulation or loss of mud in the hull is based on the way they used to drill these wells back in the '40s and '50s with fluids. And that was the

primary indicator of fracturing and that's what they were looking for in the reservoir.

Q. Yeah.

A. So, I mean, it isn't ever good to lose a lot of fluids in a formation from a reservoir standpoint, especially.

Q. Right.

A. We feel that by going with air drilling -- and that's what our plans are, to do air drilling -- that we'll minimize the loss with the air drilling. We do that quite often in other areas we operate in as well.

I would like -- now, as far as the water down there, as far as confined reservoir parameters down there, until I get down and we are able to look at it through logs and through sonic logs to determine the resistivity or the resistive forces on top and bottom for containment, you know, everything I would be saying right now would be based on 1950s information. That's part of our plan of drilling to determine --

Q. And they didn't have real good logs back then.

A. They didn't have hardly any good logs. So, I mean, a lot of this is hand-written information that you see talking about oil dripping off the hand of somebody.

Q. And they didn't know a whole lot about how to produce out of shales in those days.

A. The shale concept, as we all are aware of -- the shale concept has been a recent concept from the mid '90s to

current. And there's a lot of technology in the oil and gas sector applied to shale production.

Q. Yeah.

A. Most of it, I mean -- people have been drilling through shales, these productive shales, such as the Fayetteville, the Haynesville, the Mancos, Marcellus up in Pennsylvania, the Barnett down in Texas, even the Cotton Valley Lime Sequence. They've been drilling through those for years, 30, 40 years. And it wasn't until we were sort of running out of the other stuff that people started focusing on that. It's very high cost to do these shale completions. And it does require, in most cases, large stimulation treatments.

Q. And you're expecting to produce oil from the shales?

A. From the silt. Inside the Mancos Shale, which covers a big horizon, there is what they call the Niobrara A, B, and C members. The Niobrara, what that is, that's a silty, thinly laminated silt members, thinly laminated shell members that are very brittle. And that's where the reservoir is created whenever this thing is flexed. Those brittle members contain it, and that's where your fracture is.

Now, the shale above -- because the interesting thing about the Mancos, which is very unusual, the Mancos is not only the source, it's the reservoir, and it's the seal. And very seldom do you find that in a reservoir. And so what we have to

do when we run our logs in these wells, we're going to have to run some sonic logs and some logs so we can determine the compressibility, the overstress, the overburden, of these reservoirs to find out the perf. And I think Glenn is going to address some of that in one of his slides here in a minute.

Q. Okay.

A. But, also, one thing we don't want to do is use a big fluid frac for these fracs. We're going to be using a CO2 foam which is 70 percent CO2 and very little water and at 30 percent fluid phase because of the exact reason you said, loss of circulation.

Q. Right. What depths are these wells going to be drilled to?

A. Well, where we are right now, it looks to be somewhere between 2,000 feet as a target, 2000 to 1500 to 1700 feet, right through that range. It could be higher. It just depends on the structure -- the dipping structure.

Q. You said you didn't think that you'd actually be drilling on 40-acre spacing.

A. Everything that I'm reading -- and unfortunately these articles, I have volumes and volumes of articles written about this area, about the Chama Basin which I can give to anybody who wants them. That's what we have to go off of, the existing producing around it.

Q. Yeah.

A. And if you look at the articles, one thing they all have in common is they are overdrilled. And because of -- like East Puerto Chiquito was overdrilled because it was a competitive acreage position. So if you look at it in the true sense of a parallel fracture system that is parallel, and these fractures are, if you buy the concept that you have this incline and then you have the Brazos uplift here, you've got the inclines over on the west side, these things should run for quite a ways -- we hope.

Q. You said something about 320s or 640s as a possible spacing pattern?

A. The spacing I would like, I would hope that we could do them on 640s, maybe 320s, but until we actually get into the reservoir and see what we have, that's a wish for me.

Q. I understand that. What we have typically done in the past -- and I guess because we kind of have had a priority of certain ways of doing things, but we've usually said, okay, when the operators come in and ask for a special pool rule, then we say, okay, the special pool rule will be in effect for X period of time. And then at the end of that period of time, it's going to expire to go back to statewide rules, unless you come in and show that the field and the special rule is appropriate.

Given what you're telling us today -- and I'm just thinking off the top of my head, now, I haven't discussed this

with anybody -- might it not possibly have some time limit here and say if you do not come in and file an application for special pool rules, say after some period of time, six months to a year or something like that, then the OCD will undertake to make an investigation and propose rules itself for this field.

A. I think that's very fair. The key is we have to get in and start drilling so we know the type of productivity of the reservoir.

Q. Well, I certainly understand that. That's why we do these temporary special pool rules.

A. But that's a reasonable request.

MR. A. TRUJILLO: And I'm going to object, Mr. Hearing Examiner, and ask you to clarify that you are speaking in the hypothetical if these applications are approved.

MR. BROOKS: That's what I said. And I have not discussed this idea with the director or anybody else, and I was just getting the witness' reaction to it.

And yes, that would be the idea -- it was a condition we might put on the approval in the event that the permits were granted.

Q. (By Mr. Brooks): Okay. You said something about you would be using a tank battery at each location?

A. Yes.

Q. Do you anticipate moving the production by truck?

A. At this point, I think a truck would be the least invasive, unless we can build a pipeline system, but in this terrain, a pipeline system would leave a huge scar on the ground. So a truck would be -- now, we can if we're in areas that are a reasonable distance, we can -- and we have common mineral ownership -- we can do a consolidated facility between two or three wells. But it's going to be dependent on that and the distance away. Because the last thing I want to do is build a pipeline system down the side of a mountain out here, a hill, and have the scar. It's awfully hard to fix that.

Q. And although the exhibits haven't borne it out so far, your counsel stated in his opening statement that you were going to be using closed-loop systems.

A. That's correct.

Q. Will you have a drying pad?

A. Well, we're going to show you in just a minute when Glenn presents his side of it. We're going to show you the schematics of the closed-loop system, exactly the pallets underneath it, the catch basins, engine-wise and all of that, and he should make it clear.

Q. Well, with that equipment and your drilling area and your tank batteries, how much -- what size of location are you going to be needing?

A. I don't think it's a whole lot larger than the actual size. Somewhere around 100 foot by 150 foot, something

like that. I don't think it's much bigger than that because after all, you don't have to have your pits out there. Your pits are on the surface, so your actual footprint would be somewhat smaller. I'm not sure of the exact --

Q. Would another witness be the person to discuss this with?

A. That's it.

Q. Okay. Back to the spacing pattern. It looks like you've got a big acreage block out there.

A. That's correct.

Q. So you're probably not going to have to drill a lot of wells for competitive protection, right?

A. That was the key, yes. That's why we got such a large position.

Q. And one other question about your acreage block. Do you own any surface out there?

A. No, we don't.

Q. And when your -- assuming your oil and gas leases were to expire, would you be out of the whole area?

A. Yes.

Q. That would be -- that's the only thing you own out there?

A. That's correct.

MR. BROOKS: That's all I have here.

MR. HALL: Mr. Examiner, we do have available for you

the PowerPoint slides of the map. There was some difficulty in looking at the P and A wells that are out there. We'd be glad to show that to you if you would find that helpful.

MR. BROOKS: Very good. The reds are your locations?

THE WITNESS: That is correct.

MR. BROOKS: Red dots? Okay. I pretty well followed that on the map. Do you have redirect?

MR. HALL: Very briefly, Mr. Examiner.

REDIRECT EXAMINATION

BY MR. HALL:

Q. Mr. Craft, you were asked by counsel about the water aquifer out there. You won't be drilling through any known municipal drinking water supply, will you?

A. Not that I'm aware of.

Q. The analogy on drilling through water is from the Puerto Chiquito Field; is that correct?

A. That's correct.

Q. And what was the experience there in terms of volumes of water?

A. The volumes of produced water were very small. It doesn't have a lot of free water in the reservoirs there. And so -- but the associated water that was produced, which as I said earlier, was very limited, was not salty. It was on the fresher side. And plus, you would expect that at this level where this field is.

Q. Explain to us what you mean when you say associated water.

A. Associated water is water that's in the fracture systems in conjunction with the oil. And so the oil and the water exist together in there. And so when you produce the oil, you'll produce a little bit of water if it's there.

Also in a normal reservoir where you have a surface, your associated water is what's going to be associated -- or your producible water is what's associated with the rock wall or the surface.

MR. HALL: That concludes my redirect.

MR. BROOKS: Okay. I will allow recross, if you want to, given the fact that I asked some questions that weren't covered on direct.

MR. A. TRUJILLO: No recross.

MR. BROOKS: Okay. Very good. Mr. Hall, you may call your next witness.

MR. HALL: Mr. Examiner, at this time we call Mr. Glenn Reed, who has previously been sworn.

GLENN REED

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

DIRECT EXAMINATION

BY MR. HALL:

Q. For the record, state your name.

A. My name is Glenn Reed.

Q. Mr. Reed, where do you live and by whom are you employed?

A. I live in Ft. Worth, Texas and I'm employed by Approach Resources.

Q. And in what capacity?

A. I'm executive vice president of engineering and operations.

Q. Okay. Could you give us a brief summary of your job responsibilities?

A. Okay. Well, I'm in charge of all the drilling and engineering in all operations of the company.

Q. All right. You're familiar with the lands that are the subject of this application and proposed wells?

A. Yes, I am.

Q. Have you previously testified before the Division and had your credentials accepted as a matter of record?

A. I have not.

Q. Please give the Hearing Examiner a brief summary of your educational background and work experience, please.

A. I graduated with a Bachelor of Science degree in petroleum engineering from Texas Tech in 1982 and I've worked since then in the oil and gas industry. I've drilled and completed in excess of a couple thousand wells, ranging in depths from a couple of thousand feet all the way down to

17,000 feet. Some of those being in the sensitive wetlands of East Texas.

Q. And are you a registered petroleum engineer in Texas?

A. In Texes.

Q. All right.

MR. HALL: At this point, we'd offer Mr. Reed as an expert petroleum engineer.

MR. A. TRUJILLO: No objection.

MR. BROOKS: So qualified.

Q. (By Mr. Hall): Mr. Reed, does Approach seek approval of the six APDs referenced in Approach's application?

A. Yes.

Q. And does Approach seek to exercise its right to drill under the four previously approved APDs?

A. Yes, we do.

Q. Let's look at the exhibit book, please. Would you refer to Exhibit Tab 8. Under that tab are sub-tabs A through J -- I'm sorry, A through I. Would you identify those, please?

A. These are the well files for the wells we have permits on and ones that we're requesting permits for.

Q. Let's describe the contents of the materials under each of tabs.

A. Okay. In A, we have a form C-101 and a C-102.

We have an aerial photo. And a C-144, requesting the use of a closed-loop system.

Q. Now, does the C-144 include a schematic layout view of the well site?

A. Yes, sir, it does, including the closed-loop system equipment.

Q. All right. And does it also include an operations plan in each case for each well?

A. Yes, it does.

Q. Okay. Following those materials, is there a blowout preventer stack diagram?

A. Yes.

Q. In fact, there are two; is that correct?

A. That is correct.

Q. Is it your understanding that in each case for each of the wells the applications for permits to drill and all of the regulatory materials are complete?

A. Yes, it is.

Q. All right. Let's talk about the C-102s chiefly. If you could turn to -- as an example, the well under Tab C, the Sena No. 2 well. And then if you'll turn to the C-102 acreage dedication plat. In each case, were the locations certified by a surveyor?

A. Yes, they were.

Q. Can you discuss briefly with the Hearing Examiner

the situation you encountered with respect to locating these wells in an unsurveyed area?

A. Since it was unsurveyed, what we did was we spotted the wells by lat/longs, GPS lat/longs.

Q. And is it your understanding that the identification of those well locations by that means is acceptable to the OCD's district office?

A. Yes, sir.

Q. In fact, in certain circumstances, was there some difficulty in establishing the actual proximity to a section line?

A. Yes, there was.

Q. Because the section lines don't exist?

A. That's right.

Q. And each of these wells are wildcat oil locations; is that right?

A. That is right.

Q. And again, what are the closest pools?

A. Well, there's no pools within a mile radius of these wells.

Q. Okay. Has Approach Operating, LLC filed its financial assurance for the well plugging with the NMOCD?

A. Yes, they have.

Q. And now, did you supervise the development of the drilling plan for each of the wells?

A. Yes, I did.

Q. And does Approach's plan for each of the wells comply with the rules and regulations of the Division as you understand them?

A. Yes, they do.

Q. Now, Mr. Reed, do you have an opinion whether Approach's drilling plan will adequately protect against injury to human health and the environment?

A. Yes, I do. We employ rig contractors that have an HSE program and do their own rig inspections that we supervise or agree to. The companies that we don't -- that don't have one in place, then we let them use ours.

Q. Tell the Hearing Examiner what that term means, HSE.

A. HSE is Health, Safety, and Environmental.

Q. And typically what comprises an HSE plan?

A. Well, we'll have a site assessment done. It will have a Phase 1 environmental assessment. And then we also, since we're drilling with air, if the crews aren't familiar with them, we put them through a safety program. Since we're going to be using a closed-loop system, if the crews aren't familiar with that, then they'll go through a training program for that system also.

Q. All right. And in the case for each of these wells in Rio Arriba County, did Approach design the rig pad it

plans to use taking into consideration the recommendations of the HSE consultants?

A. Yes, we did.

Q. And tell us what that process will consist of when you get around to actually designing and constructing those rig pads?

A. Okay.

Q. Do you do an environmental assessment?

A. Yes. We do an environmental assessment, and then we sample -- do soil samples to establish a baseline, you know, of the soil that is there. And then we are constructing these pads and using the guidelines of the BLM.

Q. Will they be designed to control runoff, runon, and erosion?

A. That's right. We'll have diversion ditches around them. It'll control, you know -- there won't be any runon. And then we'll have the locations built where there won't be any runoff.

Q. All right. During actual drilling operations, do you undertake any monitoring program at all?

A. Yes, we do. We'll monitor and keep, you know -- people come out and check to make sure that on an ongoing basis there's not something wrong. If there is, it can be corrected then instead of after the fact.

Q. Okay. When the drilling rig arrives on location,

is there any sort of inspection?

A. Yeah. We do a rig inspection of it. And then -- well, before it comes, we will do a rig inspection when we first look at it if it's one we're not familiar with. Then once they rig up, we'll do a complete inspection on it at that time. Yes, sir.

Q. Okay. Now, will you monitor for discharges, storm water runon or runoff during drilling?

A. Absolutely. Absolutely.

Q. And do you also monitor for noise and dust pollution?

A. That is correct. Yes, we will.

Q. If the well is successfully completed, what are the steps then?

A. If it's successfully completed, then what we'll do is, do an interim reclamation where we will go ahead and just leave a minimal footprint that we'll have to have to produce the well or work on the well at a later date. All the cuts and everything will be put back and contoured as per, you know, the area. The equipment that we put in will be painted to match into the landscape around it.

Q. All right. If the well is not completed as a producer, what do you?

A. If it's not completed as a producer, we'll P and A it as per the OCD recommendations or approval. And then the

entire location and road will be reclaimed and put back like it was, reseeded. The topsoil will already be pulled off to start with and so then we'll just put the topsoil back on and reseed it.

Q. All right. And in either case, whether it's a producer or P and A well, is there a follow-up environmental assessment?

A. Absolutely there is. And if it's a producing well, it's an ongoing deal. Every six months or so we'll check it. But certainly, if at the end of the well, if it's a P and A's well, then we'll do an environmental assessment after we get through drilling the well before we start the reclamation to make sure there's not something that's been spilled.

Q. Right. Tell us what Approach will do for spill prevention and control?

A. We have an SPC plan that we do that's a spill prevention, control, and counter measures. And we have a third party environmental company that does our environmental and safety. And they -- so we do one of those on every well.

Q. All right. Do you have an emergency response plan?

A. Yes, we do. We do have an emergency response plan also that's filed with the local authorities, the fire department, the sheriff's department, and all that for public safety.

Q. And is that maintained on site as well?

A. It's maintained on site.

Q. Tell us generally what an emergency response plan consists of?

A. It'll be things like, you know, if there's certain chemicals on location, then it would have the MSDS sheets for each of the chemicals. Or if there is fire out on location, then the fire department would already have directions to it and be able to respond accordingly and control access to the location.

Q. All right. Now, let's discuss with the Hearing Examiner your plans to use a closed-loop drilling system. And you might want to refer to our PowerPoint slides under Exhibit 1.

A. In this exhibit, it would be --

Q. Let's look first at Page 11 of Exhibit 1.

A. Okay. What this is, is the plan of the closed-loop system. And what it consists of, the rig is -- and maybe I should stand up there and point at it -- but you can see the substructure sets of the rig, the square in the middle. And we will have steel tanks that contain fluid in them that is parallel to the rig there.

Q. Are they colored dark gray in this slide?

A. They are colored, yes, dark gray.

Q. Okay.

A. From the return, since we'll be drilling with air, the returns will come and go to the vessel there. That's called the drilling muffler. And what that does is, air will go through there with the cuttings. We'll be circulating mud through the bottom of that muffler. And it has a vortex in that muffler rigged up to where it'll separate the cuttings from the air. And the cuttings will stay in the fluid and the air will come out the top of that vessel to the blooie line. And then -- well, I think that diagram is a little different. The one in the book here shows that the blooie line will go out to the flare tank.

Q. Where will it -- show us the --

A. Well, that slide doesn't have the flare tank. The ones in the books have the flare tank.

Q. Let's look back at the book, then, to Page 11. And in the upper right-hand corner.

A. The blooie line will come out from the drilling muffler right here. And it'll come out to the flare tank. And there will be a flare wall there that anything coming out that blooie line will hit that wall and then it will be sloped to where it runs back into the tank. So if there's any -- if we have to go to miss-drilling or anything like that, then if there's any fluid at all that comes out of the hole and doesn't get caught in the drilling muffler, it will just hit that wall and run back down into the steel tank.

Q. Now, is that flare tank below grade?

A. No, sir.

Q. And explain the construction of the flare wall?

A. Okay. The flare wall will just be a wall of dirt that's above the wall of the tank, and it'll be sloped. So when everything comes out and hits that wall, if there's any fluid in it at all, or even a mist, it'll run down into the tank.

Q. What will be coming out of that blooie line?

A. Most of the time it'll just be air.

Q. Okay.

A. The drilling muffler has a de-duster in it which essentially sprays water in there to de-dust the fluid to minimize the amount of dust that's even coming out of the blooie line.

Q. So the drilling muffler functions as a dust suppression equipment?

A. Exactly.

Q. Okay.

A. Then the cuttings, when they circulate it through the drilling muffler, it'll go across to the shale shaker, which is -- you'll see it right there. It's next to the drilling muffler. And that's where the cuttings will be separated from the drilling mud.

The drilling mud will go back into the steel tanks.

And then you can see that -- I believe it's called drive and catch there -- and a front-end loader will go in there when the cuttings pile up there. They'll drive in there and just scoop them up and then they'll take them out to these three-sided tanks on the side that's called cutting storage. And they will be put in there until such time we finish the well, then they'll be hauled off to the land fill.

Q. So are there any pits or below-grade tanks utilized at all?

A. None.

Q. Let's look at the next slide your -- the Slide 12 under Exhibit 1. Explain to us what this shows.

A. This shows the flow diagram of the closed-loop system. And you'll see when the RCD is coming out from the well, from the rig.

Q. Just a minute. Tell me what RCD is.

A. It's just the rotary drilling rig.

Q. Okay.

A. You can see right there at the blooie line where those three points, those three arrows, come in right there. Well, that's where they circulate the water back through, and it comes in contact with the air and the cuttings and everything that's coming out of the well into the drilling muffler. And that's what suppresses the dust and all the cuttings where they will drop out inside the drilling muffler.

Q. So Slide 12 doesn't slow us an actual, physical array on the ground, rather it shows the path for the dust and fluids and cuttings?

A. That is correct. That's just the flow diagram of all the fluids and everything that's in there. If for some reason, due to well control or something else, we have to load the hole and go to drilling mud, all the components are there for a closed-loop system using drilling mud.

Q. Okay. Will there be any on-site burial of drill cuttings or other materials?

A. None.

Q. Where do they go?

A. We'll haul them to the land fill, a permitted land fill.

Q. A disposal facility permitted by the Division?

A. Correct.

Q. Anything further with respect to the closed-loop drilling process?

A. I believe that's it.

Q. Okay. How long does it take to drill these wells?

A. On air, these 2000-foot wells, it'll probably take about three days, including surface casing -- cementing and surface casing. On air it won't take very long to drill these wells.

Q. And you have a basement obligation well, in addition, correct?

A. That's correct.

Q. How long will that well take, do you expect?

A. That one will, if we can drill the entire well on air, then it should take about 9 or 10 days to drill. If we have to drill it on mud, it would probably end up taking, you know, 20, 25 days to drill with mud, a 6,000-foot test.

Q. And for a typical well that Approach might operate and might drill in Texas, how long do those drilling times typically take?

A. Well, around Ozona, we drill 8,000-foot wells in about six to seven days on air.

Q. Okay. And how about with fluids?

A. On the ones that we've had fluids, they've been about 18 to 25 days on them.

Q. Okay.

A. The thing about air that we need to drill, it's not only the speed, but as you can see, these other wells that they drilled in these fields that, you know, they did record some shows. But by drilling with air, you can see your shows as you are drilling. And so I think it gives us a lot better chance of evaluating what we have and any potential reservoirs of water or oil. You know, whatever we find, we'll be able to see a lot better than we would on drilling mud.

Q. By using air instead of drilling fluids, do you minimize the risk of environmental damage from drilling?

A. Absolutely, as well as formation damage.

Q. All right. And you eliminate the need for pits of any type, correct?

A. That's correct, yes.

Q. What are your volumes on your steel tanks?

A. We'll have about 900 barrels of pits -- not pits -- but steel tanks out there. Plus, you know, the tanks that we have are diesel and have other lubricants and stuff in them.

Q. Now, there will be some need to maintain some fluids on location, won't there?

A. Yes, there will be.

Q. Tell us about that.

A. We'll need to keep fresh water on location for cementing our casing strings. And then we'll have brine water on location in case we have to go to fluid. These shales are so sensitive to fresh water that they'll swell on you. And also even the reservoirs. You'll do a lot of formation damage. So if we go -- if we load the hole, we'll have to do it with a salt gel.

Q. And why would you need to load the hole?

A. For well control. If it came into a well control situation or we started making, you know, more water than we

could handle on air.

Q. Prudent drilling practices and safety considerations require you to maintain some fluids on site, correct?

A. That is correct, yes.

Q. How about fuels?

A. We'll have diesel and lubricants on location.

Q. Okay. What is the protocol for the storage and use of the fluids like that on location?

A. The protocol?

Q. For storing fluids?

A. Well, for storing them, we'll have diesel tanks and, you know, they'll be contained. And that's it.

Q. Does your search of the available data indicate to you that you're likely to encounter hydrogen sulfide in concentrations greater than 100 parts per million in a gaseous mixture in the process of drilling?

A. I don't anticipate it. We haven't seen any evidence out there in the other wells, but we will have compliance packs on location, because this is an exploratory well. We will have compliance packs just for safety reasons in case we do encounter them.

Q. All right. Mr. Examiner, we'll be presenting a hydrogeologist this afternoon, but let me ask this question about water in the course of locating these wells. Did

Approach take into consideration the proximity to groundwater, fresh water wells and surface water?

A. Yes, we did.

Q. Let's turn back to Exhibit A, if you would. Again, back to the well file we have for the Sena No. 2 under Tab C. To access the location for the Sena No. 2, you're going to be required to cross the TA Creek and one or more acequias; isn't that right?

A. That is correct, yes.

Q. Where you are required to cross water courses like that, can you construct crossings that will not interfere with access to and use of those water supplies?

A. Yes, we can, but we feel like it would be prudent for us to work in conjunction with the local people, you know, to get their input on how they think they would be better crossed, because they've been there a long time and they know a lot more about it.

Q. So you would confer with the acequia associations?

A. Absolutely.

Q. Let's talk about your plans for your casing and cementing program. And if you would, let's turn to -- back to Exhibit 1 and Pages -- Slides 8 and 10. You have two well bore schematics there, right?

A. That is correct. I did one of a typical shallow

well, 2000-foot well. And if you'll look on the previous page, Page 7, you'll see a list of wells there that are over in the Puerto Chiquito Field, the surface setting depths -- or the settings depths for surface casing. And they drilled TD and projected depths there.

But I felt like we would be better served and safer if we planned on setting 350 feet of surface casing of 9 5/8, and then drilling a 2,000 foot hole and then setting 4 1/2-inch casing.

Q. Okay. So let's look at your Exhibit 7 and 9, your surface pipe depth. If we refer to Exhibit 7, it's showing an average depth of surface pipe to what?

A. The surface pipe depth is anywhere from 20 feet to 150 or 200.

Q. And that gives you that average DEMENTSDZ of 93?

A. Yes.

Q. And again, your plans are to set surface casing to what?

A. 350 feet.

Q. Okay. Let's look at the information on Slide 9.

A. These are the deeper wells that they set surface pipe of, you know, an average of 222 feet.

Q. Okay.

A. Now, on the Slide 10, that is our proposed deeper well, the basement test. And the reason we're proposing 9 5/8

casing and 4 1/2-inch casing is if we encounter any water flows or anything that needs to be protected, then we have enough room to set an intermediate string in there to protect whatever we need to, and then still continue on drilling our deep hole.

Q. Okay.

A. The well, the Spills well, is one of the wells that was drilled offset. They were going to be one of our closer wells, and they drilled to 6,000 feet without having to set an intermediate string, but we just want to have that option.

Q. Right. Let's go through the sequence of events for the Hearing Examiner when you first drill your hole for your conductor pipe all the way through your cement program.

A. Okay. What we'll do is we'll drill the surface hole with air, if possible. And we'll have, you know, a 3,000-pound working pressure blowout preventer on it. We'll set a 40-foot conductor -- set a 14-inch conductor to 40 feet. So we'll be able to run a rotating head when we're drilling with the surface hole. And we'll use a 3,000-pound blowout preventer.

And we've got a sequence that we test, how often we test the BOP. Every time we pull out of the hole we check the ram and make sure the rams are closed and everything. We don't expect any overpressured zones. But in the event that we do, then that's why we'll have drilling mud on location for that.

We'll drill a 12 1/4-inch hole for 350 foot, set 9 5/8-inch casing. And then drill out -- what we'll do is, we'll drill out the shoe. We'll have probably, approximately 10 feet or so of open hole below us, and our standard procedure is to test the shoe. And we will test it to pressure -- we will exceed the pressure that we're expecting to see from the well. So if it holds, that means we don't have any communication with the -- we've got a good shoe test. Then we'll take off and start drilling.

Our proposed cementing of that 9 5/8-inch casing is that we're going to use Premium Cement. And after 24 hours, it'll have about 400 psi of compressive strength. And then after 72 hours it'll have about 675 pounds per square inch of compressive strength.

When we drill our production hole, we're going to set 4 1/2-inch casing and we will cement it using a 50/50 Poz. And with the additives and everything we were planning on bringing up about the height of the cement about 2000 foot. If we need to tie it back to surface for any reason, then we'll just go ahead and tie it back to surface.

The compressive strength of this cement after 72 hours is about 3,000 psi. So back on our surface string, I know there was some questions the other day about that, you know, using 9 5/8 in a 12 1/4-inch hole. What we typically do is, we'll use three bolt spring centralizers on the first

joint, and then we'll use a centralizer every third joint on the well. So we pretty well have the pop centralized. Then when we pump it, we make sure that we are pumping in turbulent flow. If you get too big of an annulus there, and you're not in turbulent flow when you pump that, you know, the profile of fluid moving in an annulus, the velocity of the fluid on the wall of the casing and the hole will be zero unless you're in turbulent flow.

So that's why it is an industry standard that you can run 9 5/8 in a 12 1/4-inch hole. We feel that by doing that and the shoe test, then we pretty well can guarantee that there's no communication.

Q. Can these wells be drilled safely utilizing an annular space less than three inches?

A. Yes, sir.

Q. All right. Do you have any plans to run a casing bond log or temperature log?

A. What we do is, we don't circulate the cement on the surface hole. We'll run a temperature survey and see. Because most of the time you run excess cement, because when you drill these holes, you'll have washout in them. You'll actually end up with a bigger hole.

So we run excess cement. If we don't circulate cement, what we do is run PVC pipe down the side between the pipe and the annulus and then we'll pump cement and top it out

where we know we've got cement top to bottom. We don't have to perforate the surface casing, because if you do, then you're jeopardizing the integrity of the casing in the event you have a well control problem.

Q. Now, what does temperature log data tell you?

A. It'll tell you where the top of the cement is.

Q. Okay. Let's turn to Exhibits 9 and 10 and let me have you identify those two exhibits.

A. Okay. These are the operations plan for the Sena No. 2, and 10 is the operation plan for the Sultemeier No. 1, which was our proposed first deep well.

Q. All right. If the Hearing Examiner wishes to get more details about the drilling operations plan, may he refer to these two exhibits?

A. Absolutely. Now, the difference in the two is -- really the only difference in the two is the intermediate casing, if necessary. Like I say, we designed it to where we could run intermediate if we need to, if it's required. So we if we don't need it, then we don't. But that's basically the only difference between the two.

Q. All right. In your opinion, Mr. Reed, can the fresh water zones be protected with the cement job that you are proposing for all of these wells?

A. Yes.

Q. Let's talk about how these wells will be

completed.

A. Okay. What we'll do, is the production casing will be perforated, and then we'll hydraulically fracture them with a CO2 foam. And if you'll turn --

Q. Let's refer back to Exhibit 1 and Slides 13, 14 and 15, and identify those. Let me ask you to elaborate a little bit more on the well fracing process?

A. Okay. What we do is, we use CO2 foam and with pressure, we break down the formation through the perforations. And then we'll pump this fluid along with sand, and we'll create a fracture in the reservoir and then we will prop it open with sand. And then we shut it in for a while to let the gel break it and then we flow the fluid back.

Q. Are you confident that you can keep the fracture wings contained within your fracture interval?

A. Again, I am confident. Because what we did on this slide here you can see -- and maybe --

Q. And you're referring to Slide 13?

A. 13. What I did was I took three intervals here that's in the --

Q. Let me ask you this: This fracture profile is from the Spill Brothers No. 1 well?

A. That is right. And I wanted to show where it was. Here's the Sultemeier Well here. And here's the Spill Brothers dry hole right here. When we got logs for that well,

they had a sonic log. And what you can do from a sonic log is create a stress profile of the formations.

And you can see on the left-hand column here that the brown and the yellow is the lithology. Like Ross was talking about earlier, these laminated sands are in shales. There are just laminations of them. And from that they can determine -- from that sonic log, they can determine the modulus and elasticity of the formation.

So what this is, is a fracture profile from a frac pro run that shows that at the rate and pressure that you're pumping, what the maximum height of the fracture will be created. Now, the colored part is the prop part. The white part of that fracture is just the pad fluid that is just the water. It'll close when you blow the fracture fluid back.

Q. When you say the colored part is the prop part, did I hear you correctly?

A. That is correct, yes. And that's different -- what that is, the blue is the least conductivity and it goes all the way to the red and it has the most conductivity of your fracture.

Q. All right. So this slide slows the fracture profile at what depths?

A. Yes. It's 750 feet. Now, there's -- this model is really a skeptical model at this depth, because the fract pro does not do pancake fracs.

Q. Explain what you mean.

A. Okay. You're looking at that fracture wing like this, just like it is right there. Well, you can go through a series of calculations that when your pressure is less than your overburden pressure, your frac is actually going to be like this, like a pancake.

Q. And so you are indicating for the Hearing Examiner in a horizontal fashion?

A. Right, in a horizontal fashion. And if that's the case, the height of the fracture, the growth of that fracture is not going to be 100 feet. It's going to be just maybe a few feet. But it just goes out like a big pancake.

And if you go through those calculations, which I've done, based on this stress profile, anything above about 1600 foot, you're more than likely going to get a pancake frac instead of a horizontal frac. But -- I mean, instead of a vertical frac.

But with this frac program, I wanted to see if for some chance we did get a vertical fracture what the height growth would be. And it shows that from that, at about 650 feet, the formation is ductile enough there to contain the fracture. It's a barrier right there.

Now, the next slide what I did was -- and that is -- that one right there, the 600 feet correlates to about where the Niobrara Formation would be, the Niobrara sub-member of the

Mancos Shale would be. And this one is -- our target zone from the permits was the Graneros, so this is the same Spill Brothers stress profile on the left there. But it shows the height growth would only be about the same, 100 feet.

Q. Now, tell us why you have a stress profile for these different depths? Of what value is the stress profile for the 600-800-foot depth?

A. Well, I wanted to show that it wouldn't go up into the groundwater or up in the water zones.

Q. All right. Go ahead.

A. And this one is just, you know, showing there's not a lot of height growth in this one either. And then the last one is, even though it's going to be below the total depth of our wells, the next slide --

Q. Let's establish for the record, you're referring to the fracture profile from 1300 feet to 1500 feet. In our exhibit book, it's No. 14. Here it says 13, but we want to refer for the record.

A. Oh, yeah. It does. Okay.

Q. Now, let's look at Slide 15 in the exhibit book, which would be--

A. This is a Morrison Formation.

Q. At what depth?

A. At about 2200 feet.

Q. Okay.

A. And since we had that information, you know, in the Spill Brothers, since we don't know the depth that we're going to encounter, we're quite a ways away. If it does come in up depth to us, then I wanted to be able show that we could control that frac height there also.

Q. Okay. In your experience, have stress profile models been established as a reliable and acceptable methodology for predicting containment in the field of petroleum engineering?

A. Absolutely. Yes, it is. It's been proven with, you know -- verified with running tracing servers.

Q. Okay. Based on the methodology that we have, the modeling that you've done and are your plans for completing these wells, in your opinion, can these completions be conducted in a manner so that the escape of hydrocarbons or other fluids out of zone can be avoided?

A. Absolutely, yes.

Q. Okay. What happens to your frac fluids?

A. Well, you flow them back. They're popped into flow-back tanks. But since it is going to be mostly CO2, if it's 70 quality foam, then there's only 30 percent of the foam that's the water phase. But they are collected in flow-back tanks and disposed of at the disposal sites.

Q. All right. Let's discuss for the Hearing Examiner how you propose to go about constructing the rig pads.

Would you discuss that, please?

A. Okay. We're going to be using the guidelines of the BLM to construct them.

Q. Let's turn to Exhibit 11 and have you -- let me ask you this: What is Exhibit 11?

A. Pardon me?

Q. What is Exhibit 11?

A. Oh, it is the Gold Book, some chapters out of the Gold Book of the construction and maintenance of the well site, and then drilling and production operations, and then our reclamation and abandonment.

Q. All right. So Exhibit 11 is excerpts from the BLM Gold Book; is that right?

A. Yes.

Q. And what's the purpose of the Gold Book?

A. Well, it's just to set the guidelines of how to conduct operations on the BLM land.

Q. All right.

A. And we feel like it's a good thing to, you know, to go by.

Q. And the Gold Book is also applicable to Forest Service lands; that right?

A. It is; from what I understand.

Q. So what you've excerpted here are the guidelines for construction and maintenance. Do you wish to point out

anything about that to the Hearing Examiner?

A. Yeah. I mean, as I was saying earlier, when we will start construction, you know, we'll end up scraping topsoil off. We'll have a, you know, a kind of a cross section of the location of how much we're, you know, going to have to move and how much dirt and everything. And so we will be constructing it to minimize erosion, and be able to divert, you know, water around the location so there's no runon or runoff.

When we finish with the drilling operations after we've tested or done our environmental test to make sure that everything is still clean, then we'll just do our reclamation -- partial or interim reclamation where we can minimize the footprint that we have out there.

Q. Do the guidelines also provide to the location and construction of associated roads?

A. Yes.

Q. And does Approach plan on following the --

A. Absolutely.

Q. -- BLM guidelines or roads?

A. Absolutely, yes.

Q. Do you plan on constructing silt traps?

A. Absolutely. Especially coming out of the culvert. You know, we have a grade there and you need one. Absolutely we will be building silt traps --

Q. Right.

A. -- where they're needed.

Q. Chapter 6 of the Gold Book is excerpted here. Does that address reclamation and abandonment?

MR. A. TRUJILLO: Which page?

MR. HALL: It's Page 43.

A. Yes, it does. It calls for the interim reclamation if you make a producing well. And as I stated earlier, we'll paint the facilities which will not only be contained with firewalls or containment to the full capacity of the tanks, but I feel like we'll probably end up having a separator there and possibly a heater/treater there. But it'll be painted to blend in with the landscape there.

And then on the final reclamation, we will essentially put it back like it was, reseed it with the same type of vegetation that's there, and everything will be recontoured -- or the same contour of the lay of the land, and the roads reclamated also.

Q. (By Mr. Hall): All right. While we're in the Gold Book, let's refer back to Page 17 at the construction and maintenance chapter. If you look in the left-hand column on Page 17, it says, "To prevent contamination of groundwater and soils or to conserve water, it is recommended that operators use closed-loop drilling systems."

Is that what you plan to do?

A. That is correct. The OCD visited three of our

locations and recommended that we use closed-loop systems, so we just made the corporate decision to just do them all closed-loop.

Q. All right. Let's talk about well site safety, human safety. Explain Approach's plans and protocols for drill safety.

A. Like I say, we train our crews and they are supervised. We will control access to the location. We'll have a, you know, supervisor on location at all times that will be staying out there. In the event that we do encounter some H2s everybody will already be certified H2S. They'll know what to do. And we just have a pretty good safety program.

Q. Do you have crew training.

A. Crew training?

Q. Yes.

A. Yes, sir.

Q. And what does that consist of?

A. Well, they'll be trained on how to, you know, handle and do their work properly on the closed-loop system, what to look for in the event something is not functioning properly to avoid a spill.

Q. Are they trained to eliminate control and protect your employees in the environment and general public from potential and accidental releases of fluids and chemical products?

A. Right.

Q. And how does Approach plan to provide for public safety?

A. Well, like I say, we'll restrict access to the location during operations or during -- while we're drilling, and we have an emergency response plan in place. And our supervisor out there, you know, he'll be -- like I say, restricting access where nobody -- in the event that we have a problem, then our emergency response plan will be implemented. If somebody requires hospitalization, they know exactly where to go and where to take them and where the closest hospitals are.

Q. All right. Let's address the issue with the pit at the Sultemeier No. 1.

A. Okay.

Q. Was that pit ever used to store drilling fluids or cuttings?

A. No. The well was never drilled. We never put anything in the pit. We just lined the pit to get ready to drill the well, but we never drilled the well.

Q. And will that pit and liner be removed?

A. Yes.

Q. Is it your understanding that because that pit and liner were unused, that a closer plan will be required by the OCD?

A. No, we don't.

Q. How about that unknown well casing you encountered there at the Sultemeier No. 1 location?

A. The casing that was there, we don't know if it's a water well or an old well -- oil and gas well that was drilled there. We know there is a fluid level in there. What we proposed to do is get a sample of the fluid and then plug the well. We recommend that we plug the well. I believe the other day we were given permission to go ahead and cap it -- at least until we can plug it.

Q. Mr. Reed, were Exhibits 8A through I, and Exhibit 1, Pages 11, 12, 7, 8, 9, 10, 13, 14, and 15, and Exhibits 9 and 10, and Exhibit 11, prepared by you or at your direction and control?

A. Yes, they were.

MR. HALL: We move the admission of those exhibits, Mr. Examiner. That concludes our direct of this witness.

MR. BROOKS: Any objections?

MR. A. TRUJILLO: No objections.

MR. BROOKS: Okay. You went fairly fast and I'm not sure which exhibits -- would you go over that again, please?

MR. HALL: Exhibits 8A through I, Exhibit 1, Pages 11, 12, 7, 8, 9, 10, 11, 12, 13, 14, 15. And then stand-alone Exhibits 9 and 10, and Exhibit 11.

MR. BROOKS: Okay. Is that all of the exhibits -- A

through I, is that all of Exhibit 8? It looks like it is.

MR. HALL: Yes, sir.

MR. A. TRUJILLO: 8A through I; I have 9 and 10 twice.

MR. BROOKS: Yeah. It looks like -- Exhibits 7, 8, 9, 10, 11, 12, and 13, 14, and 15, are admitted.

MR. HALL: Are we straight on everything?

MR. A. TRUJILLO: No. Explain to me again why 9 and 10 are stand alone. I don't --

MR. HALL: They are under Tabs 9 and 10. We also had Exhibits 7, 8, 9, and 10 under Exhibit 1, so, that's the confusion.

MR. A. TRUJILLO: Okay.

MR. BROOKS: Yeah. Pages 7, 8, 9 and 10, and 13, 14, and 15 from Exhibit 1.

MR. HALL: Correct.

MR. BROOKS: Okay. So here's what's admitted: Exhibits 8, 9, 10 11, and Pages 7, 8, 9, 10, 11, 12, 13, 14, and 15 of Exhibit 1.

[Respondent's Exhibits 1 (Pages 7 through 15) and 8 through 11 admitted into evidence.]

MR. HALL: Yes, sir.

MR. BROOKS: Okay. That's what's admitted. We will at this time take a 10-minute recess. We'll reconvene at 3 o'clock.

[Recess taken from 2:49 p.m. to 2:54, and testimony continued as follows.]

MR. BROOKS: Okay. We're going back on the record now. Okay. Mr. Trujillo, for informational purposes, the County has 1 hour, 1 minute left and Approach has 2 hours, 40 minutes left. You may proceed.

MR. A. TRUJILLO: Mr. Hearing Examiner, could we get the door closed before I start?

MR. BROOKS: Yeah. Would someone shut the door please? Thank you.

You may proceed.

MR. A. TRUJILLO: May I approach, Mr. Hearing Examiner?

MR. BROOKS: You may.

CROSS-EXAMINATION

BY MR. A. TRUJILLO:

Q. Mr. Reed, I want to go over and clear something up real quick. Here we have what's labeled County Exhibit 1, and I believe this is labeled Approach Exhibit 7? 6? It's the map.

Now County's exhibit indicates that the Anthony Garcia Well number is on the north side of Highway 64. Do you see that? That being north? And Approach's exhibit demonstrates -- indicates that the well site is south of 64. Do you see that?

A. I do.

Q. And now, if you'll take a look at County's Exhibit No. 19 and turn to Page 2 -- Exhibit 19. Is it not in there? I'll show you my Exhibit 19.

Now, this is Steve Finch's memorandum and Mr. Finch's memorandum indicates that the Anthony Garcia Well is north of Highway 64; is that correct?

A. It's looks like to me like it's right on it.

Q. Right on Highway 64? It's not south of Highway 64, is it? It is very near Highway 64; is that correct?

A. That's correct.

Q. And you heard testimony yesterday that the County and Mr. Finch used the lats and longs, the latitudes and longitudes from Approach's application. Do you recall that?

A. Well, correct me if I'm wrong, didn't the County say that you all converted to XY? So I don't know how -- the mathematics you all used in conversion from lat/long to XY. So that may be the difference.

Q. Well, there exists a genuine issue as to where exactly that well is located; is that right? We've got --

A. I mean, it's south of the highway. I've been out there.

Q. But the County's exhibit and Mr. Finch's memorandum indicate that it's in a different spot.

A. Well --

Q. I'm just asking. Two different maps show two different places.

A. I don't know how they calculated the difference when they converted from lat/long to XY.

Q. And they both used the same latitudes and longitudes; is that correct?

A. Well, I know that they had to go to a conversion to convert to XY. And if they're off in that conversion, then that may be why it's mis-spotted on you all's map.

Q. I understand Mr. Reed. I'm saying that three different individuals used the same latitudes and longitudes to place a spot and there are two different results; is that correct?

A. Ours is done by the lat/longs. You all did the conversion to XY.

Q. I'm just asking, Mr. Reed, if three different calculations were done and two different locations were placed.

A. Yes.

Q. Thank you. Now, you didn't physically inspect all of these sites on these applications before you actually submitted them, did you?

A. No, I did not.

Q. And no one from Approach actually physically inspected all of these sites before they submitted their applications, did they?

A. I don't know if we did. I know our geologist came up here and did some of them. And I don't know if he did them all, but I don't know if we were there to inspect all of them.

Q. Is he here to testify today?

A. No, he's retired.

Q. So -- and you didn't have a hydrologist come and look at these sites until about two weeks ago.

A. Correct.

Q. But you said that you took into consideration the groundwater and surface water features, didn't you?

A. Yes, sir.

Q. How could --

A. Based off of the study -- information provided by the state as far as the groundwater depths and stuff like that.

Q. But not in terms of having a hydrologist actually on the ground to see the features and see the water?

A. Not a hydrologist, no.

Q. Now, do you have knowledge -- you stated that the OCD official, that you know, went to three of the sites; is that right?

A. Correct.

Q. And can you identify which sites those were?

A. I believe they went to the Woolley and the Sena 1 and the Sena 2.

Q. Now, you state that -- on direct examination, you stated that Approach has six applications; is that right?

A. To be submitted?

Q. Yes.

A. I think we withdrew.

Q. That's right. It's five, isn't it?

A. Right.

Q. You have five applications. Because you withdrew Benjamin Trujillo's application; did you not?

A. There were six applications but we withdrew one.

Q. And it was Benjamin Trujillo's; is that right?

A. Right.

Q. And that was the application located between an acequia and the Rito de Tierra Amarilla, right?

A. That is correct.

Q. But you didn't withdraw the Mot Woolley Site which is 40 feet on one side from a headwater stream and 40 feet from a headwater stream on the other side, did you?

A. We did not. But we weren't aware of that until two weeks ago when we got a report from the hydrologist.

Q. You've been aware of it for two weeks, but you still haven't withdrawn that site, have you?

A. We have not withdrawn that site.

Q. And you don't plan to withdraw that site, do you?

A. I'm not going say. We may withdraw it. We may

not. We may move it, recommend a different site or what.

Q. And a new site would be a new application; would it not?

A. That's correct, yes.

Q. So you're not here -- you're not prepared to tell the Hearing Examiner today that you're going to remove that site, are you?

A. No. That we're going to --

Q. That you're going to withdraw that site?

A. We're not prepared to say we're going to withdraw it, no.

Q. And Mot Woolley's site and Rosemary Roller's sites are located in the unimpaired location portion of the Tierra Amarilla Creek; is that right?

MR. HALL: I'm going to object. This is beyond the scope of his direct.

MR. A. TRUJILLO: Mr. Hearing Examiner, the scope of his direct is the submission of these applications. These applications have a specific geographic location and specific geographic features.

MR. BROOKS: I'm going to overrule the objection. However, I do have a concern about your question because I think you're talking about location in the Tierra Amarilla watershed. I don't recall that there was any evidence -- and straighten me out if I'm wrong -- I don't recall that there was

any evidence that any of these sites is actually in the creek.

MR. A. TRUJILLO: Actually in the creek? Located within the physical creek?

MR. BROOKS: The way I understood your questions you asked him were not two of these located in the unimpaired portion --

MR. A. TRUJILLO: I understand.

MR. BROOKS: -- of Tierra -- or impaired portion, which it was, of Tierra Amarilla Creek. I want to clarify, because I don't recall or didn't understand that any of these locations was actually in the creek.

MR. A. TRUJILLO: Mr. Hearing Examiner, I stand corrected. I can clarify that for you.

MR. BROOKS: Okay. Then, if you would clarify the question, please.

Q. (By Mr. A. Trujillo): Now, Mr. Reed, you were present for Dr. Terrence Boyle's testimony; were you not?

A. Yes, I was.

Q. And you did hear Dr. Terrence Boyle testify that from the headwaters to approximately 8,000 feet the Tierra Amarilla Creek's waters are considered unimpaired by the EPA; is that correct?

MR. HALL: Again, Mr. Examiner, this is beyond the scope of his direct. We will be presenting a hydrogeologist later this afternoon that can address matters like this.

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

Q. (By Mr. A. Trujillo): Did you hear that testimony?

A. I heard that testimony.

Q. And Rosemary Roller's site is located approximately 9,000 feet; is that correct?

A. Yes.

Q. And Mot Woolley's site is located approximately 10,000 feet; is that right?

A. Right.

Q. And so both of those sites are located along the corridor where those Tierra Amarilla Creek waters are unimpaired by the EPA.

MR. BROOKS: Excuse me. There's a gentleman taking flash photography in the audience. I wish to advise you that flash photography is not allowed during the proceedings.

You may continue.

A. I heard Mr. Boyle say that, yes, sir.

Q. (By Mr. A. Trujillo): Okay. Now, so you didn't withdraw Mot Woolley's Site, and you're not going to withdraw Beth Sultemeier's site which is in the mouth of a box canyon drainage, are you?

A. We don't intend to withdraw it.

Q. And you didn't comply with the verbal commitment

to Beth Sultemeier regarding the placement of her wells after that conference. You didn't even consult with her on the second, did you?

MR. HALL: Objection. Again, beyond the scope. Assumes facts not in evidence. This witness didn't testify he had any conversations with Beth Sultemeier.

MR. BROOKS: Well, since we're getting down to the end of time here, I'd end up sustaining these objections back when he called the witnesses to allow the County to develop their case, but I do believe what they've done with regard to the landowner is irrelevant, so I will sustain your objection.

Q. (By Mr. A. Trujillo): Now, four of your initial permits that were granted were submitted back in September of 2007; is that right?

A. Yes.

Q. And you didn't include a closed-loop designation to those, did you?

A. No, I did not.

Q. In fact, you didn't apply for a closed-loop designation until about three days ago; is that correct?

A. That is correct.

Q. So all of these remedial measures that you're taking are actually after the fact; is that right?

A. At the time that we constructed the Sultemeier location, we were within the guidelines of the application.

Q. So the initial intention of seven of those applications was a pit, wasn't it?

A. Until we -- yes, until we -- if we -- until we found out the results of the rule changes, we intended to do pits, but when we saw what the rules had changed to, that's when we made the decision to go ahead and do the closed-loop system.

Q. When you saw that the rule changed?

A. Yes.

Q. It wasn't in response to this controversy, was it?

A. No. When we saw the results of the change that the OCD changed the Pit Rule.

Q. And when was that?

A. I don't know what the date of it was. I just got the --

Q. The applications were submitted three days ago -- or, actually, last week.

A. No. I'm talking about the original applications, the first four wells, the Sultemeier being the first.

Q. I'm sorry. I don't understand, but I'm going to -- we're not going to get into that line of questioning here. If you can turn to your Exhibit No. 13.

A. Mine?

Q. Your Exhibit No. 13.

MR. HALL: Mr. Examiner, this exhibit is not yet in evidence.

MR. A. TRUJILLO: I believe it was in evidence. I have Exhibit 13 on my list.

MR. HALL: I think that's part of Exhibit 1, Page 13.

MR. BROOKS: Yeah. I believe that's correct. And I believe you're right. Exhibit 13 was not admitted.

MR. A. TRUJILLO: This exhibit has not been admitted?

MR. BROOKS: I think that's correct. According to my notes, Page 13 of Exhibit 1 was admitted.

Q. (By Mr. A. Trujillo): Mr. Reed, you claim to operate Approach Resources in an ecologically sensitive manner; is that correct?

A. Correct.

Q. But you didn't consult with any of the landowners prior to placement of these wells, did you?

MR. HALL: Again, this has been asked and answered and I'll make a relevance objection to --

MR. A. TRUJILLO: I don't believe it has. And Mr. Hall is continuing to try to delay this cross-examination. I ask that any objection Mr. Hall makes not go against my time so I can actually have an adequate cross-examination of this witness.

MR. BROOKS: Well, I'm going to sustain the objection as far as this is concerned. If there are too many objections,

I'll extend your time.

MR. A. TRUJILLO: With all due respect, Mr. Hearing Examiner, I've counted at least five. And normally this would not be an issue, but the fact is that Mr. Hearing Examiner has imposed time limits on the presentation of evidence in this matter, which I feel is highly unusual for such a hearing with such technical testimony.

Now, I am prepared to do an adequate cross-examination of this witness, but I cannot do that if Mr. Hall continually objects to procedural matters that will eat away at my time.

MR. BROOKS: Well, we'll make a judgement about that after we've been through the examination. Please continue. I'm sustaining the objection because I believe that the consultation with the landowner is a Surface Owner Protection Act issue, not an OCD issue.

Q. (By Mr. A. Trujillo): Now, Mr. Reed, placement of a well is one of the first steps in terms of being ecologically sensitive, right? Would you agree?

A. I would agree.

Q. And you've testified that absolutely yes, you can prevent the release of hydrocarbons into other formations while you are fracing; is that right?

A. No.

Q. You can't guarantee that?

A. I didn't say I absolutely could prevent it. When you're fracing a well --

Q. When you're fracing -- so in other words, you can't guarantee to us that when you frac that well that you won't release hydrocarbons into the water aquifers that are below the surface in this area, can you?

A. I cannot guarantee it.

Q. In fact, that may very well may happen?

A. But I've shown industry accepted engineering practices that shows of actual measurements of formations that, you know, it shouldn't happen. And then how deep is your water? What zone were you talking about?

Q. It shouldn't happen, but that's not to say that it couldn't; is that correct?

A. How close are you talking about the water zone being away?

Q. Well --

A. Are you talking about -- if it's 1,000 feet away, it's not going to break into it. If it's 10 feet away, you might break into it.

Q. Okay. That's fair enough. You can turn to your Exhibit No. 11, which I believe has been admitted into evidence. Now, turn to Page 35, middle of the page, is says, "Wetland crossings: Wetlands are especially sensitive areas and should be avoided if possible."

Did I read that right?

A. Yes.

Q. A little further on down the page, the last sentence says, "Construction of some wetland crossings may require a Section 404 Corps of Engineers permit in addition to the approval of the surface management agency."

Is that correct?

A. That's what it says.

Q. Now, Approach may need a Section 404 Corps of Engineers permit in the well placement of the Woolley site; is that right?

A. Well, we are basing our -- we're working to do the construction of our site based off the best practices and also using BLM. Now, if it is, I don't know -- well --

Q. Well, Mot Woolley -- Mr. Woolley says that is a wetland, is it not?

A. Well, I wasn't aware of that until yesterday.

Q. Now, you are aware that that is a wetland.

A. I had heard that it was a wetland yesterday.

Q. And so Section 404 Corps of Engineers permit may be necessary; is that correct?

A. I'll have to check in to see if it is.

Q. And there was testimony that if Anthony Garcia's well is sited where the County maintains it is sited, that is a marshy area. Did you hear that testimony?

A. Where the County has it sited?

Q. Yes.

A. I heard that testimony.

Q. And so if that well is staked there, that may require a Section 404 permit; is that right?

A. If that well is staked there, if it applies to the private land, you know, we'll do what's necessary, what's required of us.

Q. Would you turn to Page 39. Now, "Pollution Control/Hazardous Waste" -- second paragraph on Page 39:

"The BLM requires immediate reporting of all Class 1 major events, such as spills of more than 100 barrels of fluid/500 MCF of gas released; fires that consume 100 barrels or more" --

Did I read that right?

A. That is correct.

Q. Now, why don't you tell us, what is Approach's ecological record in terms of spills or pollution control or hazardous waste?

A. We haven't had any spills over 100 barrels. We've had a few minor spills. I believe we've -- as far as the Railroad Commission is concerned, anything over five barrels you have to report. And that's what we do. We do a site assessment. We've had eight of them where we've had -- and two of them were confined inside firewalls of a tank battery, but

they were reported regardless. We build containment walls around the tank batteries to hold the volume of fluid of the tanks in case there is a spill or release of it. Then it is -- then it's contained right there in the --

Q. Let me ask you a question: What do you consider a minor spill?

A. A minor spill?

Q. You said that, "We've had some minor spills."

Let me just make sure this is clear. You stated that you have not had spills over 100 barrels; is that right?

A. That is correct.

Q. And you --

A. I believe a minor spill would maybe be a barrel or two. That would be a minor spill.

Q. And you stated that you've had how many of those spills, a barrel or two.

A. Eight.

Q. Eight?

A. At eight wells over the last four years.

Q. Well --

MR. BROOKS: Could I clarify? I thought you said eight -- you had had eight spills exceeding five barrels. Did I misunderstand you?

THE WITNESS: I said the Railroad Commission requires us to report any spills over five barrels.

MR. A. TRUJILLO: May I approach?

MR. BROOKS: Okay.

Q. (By Mr. A. Trujillo): Mr. Reed, what I'm handing you is marked "Railroad Commission of Texas Oil and Gas Division Crude Oil, Gas Well Liquids or Associated Products Loss Report Form H-8." Do you see that?

A. Uh-huh.

Q. Now, it says "Approach Operating, LLC" at the top; does it not?

A. Yes, it does.

Q. And it says County, Crockett, right?

A. Right.

Q. And it says -- actually --

MR. HALL: I'm confused. Are you --

MR. A. TRUJILLO: I know. I'll rectify that. I'm going to go one at a time.

Q. (By Mr. A. Trujillo): Now, Mr. Reed, the date of this is 4/23/06; is that right?

A. Yes.

Q. And it states under "Type of Liquid Hydrocarbon Loss, Gas Well Liquid." Is that correct?

MR. HALL: Mr. Examiner, I'm going to object to proper foundation at this point.

MR. A. TRUJILLO: I can lay some foundation if you would prefer.

MR. BROOKS: I think that would be premature. I'll overrule the objection.

Q. (By Mr. A. Trujillo): It does state "Gas Well Liquid," does it not?

A. Yes.

Q. And gas well liquid is liquid that comes out in the production of gas?

A. Correct.

Q. It could contain toxins. It could contain benzine, is that right?

A. It's condensate is what it is.

Q. It's condensate. Now, total barrels of liquid hydrocarbon lost in leak or spill -- I'm concerned more with Number 14, barrels of liquid hydrocarbon unrecovered. It says 140, does it not?

A. Correct.

Q. So this is a spill that is over 100 barrels; is that correct?

A. Yes.

Q. And the cause of the liquid hydrocarbon loss, Number 16, says "Cow opened 1/2 inch valve inside of loadline containment." Is that correct? Do you see that?

A. Yes.

Q. Number 16?

A. Right.

Q. Now, in Number 17, "Remedial Measures Taken and How Successful," it says, "Mixed 1/3 contaminated soil with 2/3 clean caliche," does it not?

A. Correct.

Q. So this spill contaminated the soil; is that right?

A. Right.

MR. HALL: Mr. Examiner, again, let me interpose a foundational objection. He's not laid any foundation at all. If I might have a minute with my client, I might be able to --

MR. BROOKS: Okay. We will charge that against your time.

MR. HALL: I'll withdraw that objection.

MR. BROOKS: Okay. You may proceed, Mr. Trujillo.

Q. (By Mr. A. Trujillo): Now, in Number 18, "Remarks, Area 4500 square feet with a volume of 84 cubic yards." Is that correct?

A. Correct.

Q. And in Number 7, "Description of Facility From Which Liquid Hydrocarbon Loss Occurred; tank battery." Is that right?

A. Correct.

Q. And you heard Mr. Craft testify today that a tank battery would be used?

A. Correct.

Q. Now, I've gone ahead and handed you three more pieces of paper. Why don't we look at the first one. That is dated 10/19/06; is that correct? Box No. 10?

A. Yes.

Q. And that's in the County of Schleicher?

A. Right.

Q. For the record, Schleicher and Crockett Counties are in West Texas; are they not?

A. Correct.

Q. And you heard Mr. Craft testify that that's a very sensitive area; is that right?

A. Correct.

Q. And the total barrels spilled of liquid hydrocarbon lost in this application is 83?

A. Right.

MR. BROOKS: Now --

A. It's less than 100, though.

Q. (By Mr. A. Trujillo): But it's more than one or two?

A. It's less than 100.

Q. And more than one or two, right?

A. Yes.

Q. And total barrels spilled is 83 and total barrels uncovered is 83 total; is that right?

A. Uh-huh.

Q. And the cause of the liquid hydrocarbon was a hole in the bottom of the tank, correct?

A. Correct.

Q. And the remedial measures taken is mixed 1/3 contaminated soil with 2/3 clean caliche; is that right?

A. Right.

Q. So this soil -- this spill contaminated the soil; did it not?

A. Correct.

Q. Now in the "Remarks," the area is 21 square feet with a volume of 39 cubic yards; is that correct?

A. Correct.

Q. Now, if we turn to the next page.

MR. BROOKS: And which page number? I see these have page numbers on them.

MR. A. TRUJILLO: I believe 167, Mr. Hearing Examiner.

MR. BROOKS: Okay.

Q. (By Mr. A. Trujillo): Now, Mr. Reed --

MR. BROOKS: Page 3 of the fax?

MR. A. TRUJILLO: Page 3 of the fax.

MR. BROOKS: Okay. Go ahead, Mr. Trujillo.

Q. (By Mr. A. Trujillo): Now, this H-8 report has Type of Liquid Hydrocarbon Loss, Crude Oil; is that correct?

A. Uh-huh.

Q. And the previous was Gas Well Liquid; isn't that correct?

A. Right.

Q. And this is dated June 1st, 2007?

A. Correct.

Q. And the total barrels of liquid hydrocarbon loss in this leak or spill is 12?

A. Right.

Q. And the total unrecovered is 12?

A. Right.

Q. And the cause of liquid hydrocarbon loss is, "Roustabout crew did not connect overflow between production tanks," is that correct?

A. Correct.

Q. And the remedial measures taken are, "Mixed 1/3 contaminated soil with 2/3 clean caliche." Is that right?

A. Correct.

Q. And so this spill is more than one or one; is that right -- barrels?

A. Right.

Q. And so this -- and the area, in the "Remarks" area, it is 30 feet by 10 feet; is that right?

A. Right.

Q. For 5.5 cubic yards? And another area, a mist was 40 feet by 30 feet; is that right?

A. Right.

Q. So this spill was actually spraying crude oil out in an area that covered 40 feet by 30 feet; is that right?

A. Right.

Q. And some of these sites are only 30 foot, or 40 foot away from a water source; that is right?

A. I think Trujillo was the only one, and it was withdrawn.

Q. Well, Dr. Terrence Boyle testified that there are springs and creeks 40 feet from this well pad -- or from this stake; do you recall that?

A. I heard that, yes.

Q. And the last is Page 227, Page No. 2 fax: Now, the date of this was June 16, 2007; is that right?

A. Yes.

Q. And that means that Approach was responsible for two spills in the month of June, 2007; wasn't it?

A. Well, this one was struck by lightening.

Q. That's not my question. My question was Approach responsible for two spills -- or, actually -- excuse me -- for two discharges?

A. There's no spill.

Q. No spill. I understand. There was no spill. It was struck by lightning; is that right?

A. Yes, sir.

Q. That means there was a fire, wasn't there?

A. That is right.

Q. There was a gas fire?

A. It was --

Q. A gas well liquid fire?

A. Correct.

Q. And 74 barrels were lost; is that right?

A. That's right. No spill, though.

Q. And 74 barrels were unrecovered?

A. Right.

Q. So that means that 74 barrels of gas well liquid burned throughout the night, didn't it?

A. Uh-huh.

Q. And you testified that you're going to have a fire protection response to make sure that if any fire breaks out that it's contained immediately, didn't you?

A. I said we had an emergency response plan that if an incident occurs that we would have it in place. If somebody was hurt, we would get them to the hospital and so forth.

Q. Well, the remarks in Cause of Liquid Hydrocarbon Loss states that, "Lightening hit tank battery sometime during the night. Pumper found burning in the morning."

A. Right.

Q. That means that the emergency response didn't work, did it?

A. Well, it may have been 5 o'clock in the morning --

Q. I see.

A. -- when the lightening struck, to my knowledge.

Q. But this fire burned over 500 gallons of hydrocarbons in a few short hours, then?

A. Uh-huh.

Q. That sounds like a mighty big fire, doesn't it?

A. You don't know how long it took the fire department to get there.

Q. A lot of these applications are in wooded areas, aren't they?

A. I understand.

Q. And so we're dealing here with 500 gallons of gas burning in the night in a potentially wooded area, are we not? In the case of Sena 1 -- I mean, that hill is very steep. It might take fire trucks hours to get out there.

MR. HALL: At this point, Mr. Examiner, I'm going object, argumentative and speculative.

MR. A. TRUJILLO: Mr. Hearing Examiner, I'm asking questions regarding his testimony.

MR. BROOKS: Since we're dealing with time limits, I think I will allow counsel to be argumentative for the extent of his time. I'll overrule the objection.

MR. A. TRUJILLO: Mr. Hearing Examiner, at this time

I would move for the admission of County Exhibits 51, 52, 53, and 54.

MR. BROOKS: Okay. Do you have marked copies?

MR. A. TRUJILLO: I will mark them subsequent to the hearing, Mr. Hearing Examiner.

MR. BROOKS: Well, okay. To make the record correct and complete, I will stop the time now. And let's get these exhibits marked before we go ahead so we have a complete record.

MR. A. TRUJILLO: Exhibit No. 52 will be Page No. 4 of the fax.

MR. BROOKS: Okay. I'm going to put this RAC No. 52. Which page is that?

MR. A. TRUJILLO: Upper top right-hand corner, Page 4.

MR. BROOKS: All right. I'll mark that RAC Exhibit 52?

MR. A. TRUJILLO: 52.

MR. BROOKS: Okay.

MR. A. TRUJILLO: Exhibit No. 53 will be marked by fax Page No. 5.

MR. BROOKS: Fax No. 5 is RAC Exhibit No. 53.

MR. A. TRUJILLO: And fax Page No. 3 will be Exhibit No. 54.

MR. BROOKS: Okay. No. 3 is 54.

MR. A. TRUJILLO: And fax Page No. 2 will be Exhibit 55.

MR. BROOKS: Okay. I will give my copies, then, that have been marked to the reporter. Any objections to these exhibits, Mr. Hall?

MR. HALL: No objections.

MR. BROOKS: Very good. Rio Arriba County Exhibits 52 through 55 will be admitted.

[Applicant's Exhibits 52 through 55 admitted into evidence.]

MR. BROOKS: And we'll go back to the clock.

Q. (By Mr. A. Trujillo): Now, Mr. Reed, these spills and fires took place from April 2006 until June 2007; is that right?

A. Right.

Q. That's a period of 14 months; is that correct?

A. Uh-huh.

Q. And if you total all these up over the course of 14 months, Approach is responsible for 6,600 square feet of soil contamination; is that right?

A. I haven't done the math, but --

Q. I did do the math. If you would care to, we can go over it.

MR. HALL: Mr. Examiner, he either knows the answer or he doesn't.

Q. (By Mr. A. Trujillo): "I don't know" is a perfectly reasonable answer.

A. I don't know.

Q. And Approach is responsible for 132.2 cubic yards of soil contaminated in that time; is that right?

A. I don't know.

Q. And Approach was responsible for over 235 barrels spilled of hydrocarbons in that time; is that right?

A. I don't know.

Q. But you do know that one barrel equals 42 gallons.

A. Uh-huh.

Q. So 235 barrels spilled equals 9,870 gallons that were spilled into the earth; is that correct?

A. Okay. If the math works.

Q. Now, you had 74 barrels burned in that event; did you not?

A. Correct.

Q. So doing the math, 3,108 gallons were burned by by Approach in the same time; is that correct?

A. Right.

Q. And you can't guarantee to us that these types of spills and fires won't happen in these applications, can you?

A. I can't guarantee you, no.

MR. A. TRUJILLO: I have no further questions.

MR. BROOKS: Very good.

EXAMINATION

BY MR. BROOKS:

Q. I'm not good with names. I believe you are Mr. Reed; is that correct?

A. Yes.

Q. Very good. Mr. Reed, I'm going to go back to -- and once again, both counsel can be assured that my questioning time does not come off of either of their time. I'm going to go back to Page 12 of -- well, I guess each of these is essentially the same, isn't it? I'm looking at Exhibit E, but -- Exhibit 8E, but this schematic is the same in each one, isn't it?

A. I believe so.

Q. Your drilling fluid, which is air, goes into this muffler, correct?

A. Correct.

Q. And there is mud circulating threw this muffler?

A. Yes, sir, it is.

Q. And what is that? Is that fresh water mud?

A. Yes, sir. It would be just a fresh water fluid, yes, sir.

Q. Okay. And then you're going to remove the cuttings from the mud. The mud will remove the cuttings from the air?

A. Right.

Q. And then you remove the cuttings from the mud by going through the shakers?

A. The mud comes across the shale shaker and that's where it separates the cuttings from the mud.

Q. Okay. Now, do you have multiple separation devices? It looks like you do from this diagram, but I'm not sure.

A. Well, I mean, you'll have those two screens on that shaker, and the mud will just go straight on through and the cuttings will just go off the end into this cuttings catch pit, or tank.

Q. Okay. Now, I don't know much about closed-loop systems, I'm afraid. What I do know I learned in the course of the Pit Rule debates of the OCD. And the ones they talked about there they had the mud went through multiple centrifuges to remove solids.

A. Well, if there's still solids contained in the drilling mud, or in the mud when it goes -- before it goes back into the pits, it'll go through some centrifuges. But in the diagram it shows here, if mud, you know -- in the flow diagram here, if the mud cleaners are required, they'll have a catch tank also.

Q. Okay. I see that down in the lower left-hand corner of the diagram on Exhibit 12.

Okay. Now, you say front end loader mixes and stabilizes solids in bins. Now, what is this bin? What type of structure is that?

A. It's a three-sided tank.

Q. Yeah. Okay.

A. And it's a steel tank like -- and this is what they do in Alaska in these environmental sensitive areas, is they mix them with sawdust.

Q. Yeah.

A. And it dries them quicker. And sawdust is completely inert, so that's how they -- and then they just contain them in these storage tanks until the well is complete and then they haul it off to the landfill.

Q. Well, are these bins going to be removed? Or are they going to be -- is the entire bin going to be removed?

A. Right. It will be removed and trucked off. They'll actually just, you know, take it out of these storage tanks and put it in. I believe there's one here that's called the transport where they actually take the cuttings out of these storage tanks and they just haul it off in a trailer, transport.

Q. Yeah. And then when you get through, then what about the bins? Are they removed then?

A. Yes, sir. Then the bins are removed when the rig is removed.

Q. And the bins have solid bottoms?

A. They're steel bins.

Q. Okay. Now, how big is the site. How big is your pad going to be during drilling?

A. It's going to have to be around 200 feet by 275 feet because of these storage bins and this additional equipment is going to be in there. That's about what it will be.

Q. And I'm not very good in math in my head. How many square feet is that, approximately?

A. It's probably a little over an acre.

Q. Okay. And when you go on production, assuming you do, and you're going to have a tank battery on location, as Mr. -- the last witness testified --

A. Right.

Q. -- how big a footprint are you going to have for your production location?

A. Well, it shouldn't be but about half that size. Because all we'll have to have is just a place for the storage tanks and the a heater-treater, if necessary. And then we'll just have to have enough of the pad to get a completion -- or a work-over rig in there in the future if we have do.

Q. You're going to have pumps on these wells, right?

A. We'll have pumps.

Q. And you said they were small pumping unites?

A. Right.

Q. Do you know what the height of the pumping units is?

A. I would expect they're probably going to be -- from that depth, they're going to be pretty small. They will probably be -- they won't even be 114s. They'll be smaller than 114s, so it probably won't be maybe six or eight foot tall.

Q. Okay.

A. Now, if we do deeper wells, those will be larger pumping units, and that would probably require a 114 then.

Q. Right. Have you visited these sites? I think you said you visited some of them. Have you visited all of them?

A. There was -- the day I went out there, we couldn't go up the Sena because the creek was running real -- but I did the others.

Q. And have all of those locations been physically staked?

A. Yes, sir.

Q. You testified that you're going to prevent runon and runoff. Can you describe the measures that you're going to take to prevent runon and runoff with reference to these locations?

A. We'll have diversion ditches and berms

constructed to prevent the runon.

Q. Right.

A. And then runoff, we'll have berms to do that also, to go around. It'll be inside the ditches, but if there's a -- if we're filling in, then we'll have a berm across there too to prevent runoff.

Q. Now, the witnesses testified -- and I think at this altitude, it would be a matter of common knowledge, that we could take administrative notice that there's quite a lot of snow up there in the wintertime. But, of course, you're not going to be drilling in the wintertime, I'm sure.

A. That's correct.

Q. But your production location is going to be there.

A. Right.

Q. And how are you going to control runoff from snow melt on your production location?

A. Well, we'll have the containment around the tanks -- or the tank battery. Now, to prevent it from coming off -- running off around the well, we'd have to have some containment around it also, which is --

Q. And is that incorporated into your location design?

A. It is on the tank now. I need to put it in on pumping unit, yes.

Q. Okay. Very good. And I understand another witness is going to talk about the hydrological issues?

A. Yes, sir.

Q. How did you select 350 feet for your surface casing depth?

A. Well, I just looked at those other fields and saw, you know, what they said, the dry holes that were already on this. All those were, you know, around 60 feet or 100 feet of surfacing casing is all they said. I just went ahead and picked arbitrarily 350, you know. That would give us plenty of room to protect the surface water. That's the reason.

Q. Have you studied the available data on what surface fresh water there is in that area?

A. Well, I've just seen, you know, just the report and information from the other wells and stuff, you know. And then the data that was produced yesterday.

Q. Okay. What discussions have you had about these locations with the personnel in our Aztec office?

A. Personally, I haven't. But other people in our company, or that represent us, have.

Q. Okay. But you don't know what they've discussed, then, per se?

A. Well, I know they've had discussions on the Sultemeier pit and things like that.

Q. Very good.

MR. BROOKS: I think that's all my questions. Mr. Hall, redirect?

REDIRECT EXAMINATION

BY MR. HALL:

Q. Mr. Reed, if you'll look at Rio Arriba County Exhibits, the Railroad Commission reports. If you'll look at Line 15 in the Railroad Commission reports.

A. Yes.

Q. Look at Line 15 there. It asks, "Did liquid hydrocarbon loss affect inland or coastal waters?"

In each case, what's the answer to that question?

A. No.

Q. In each circumstance reflected on the Railroad Commission Reports, did Approach comply with the remedial criteria as directed by the Railroad Commission?

A. Yes, we did.

Q. And does Approach have any outstanding violations from the Railroad Commission with respect to these?

A. No, we do not.

Q. Can you tell us briefly about the nature of the materials lost?

A. Well, I mean, it was condensate or crude oil in each case. The Railroad Commission was notified and then our environmental consultants, White Buffalo Environmental, came in and did the remediation on it and then came back six months

later and did a post-remediation site assessment on it.

Q. Okay. Let's find the Anthony Garcia No. 1 Well. Let's turn to Exhibit 8E and the aerial photo. Is the well spot on the aerial photo based on GPS lat/long.

A. Yes, sir.

Q. The well is south of the highway?

A. South of the highway.

Q. Okay. Let's turn to Exhibit 8C, and if you would turn to the C-144 Form that's part of the well file for the Sena No. 2. It's marked up in my book.

A. Okay.

Q. Let's look at that. Do you have that in front of you, the C-144?

A. Yes, sir.

Q. You were asked why Approach only recently indicated to the Division that it's going to use the closed-loop drilling and why you only recently filed any sort of regulatory permit application to the OCD. Let's look at the first page of the C-144, the upper right-hand corner, does that tell us when this form was first promulgated by the commission?

A. Yes, June 16, 2008.

Q. Okay. Let's go through the components of some of this very briefly. If you look on the first page, there's a place for you to check on the right-hand side for closed-loop system.

A. Correct.

Q. And that was checked --

A. That is correct.

Q. -- in this instance?

A. That is correct.

Q. And if you'll look at the bottom of Page 2 of the C-144, there's an additional place for an operator to provide information for a closed-loop system permit. Do you see that?

A. Yes.

Q. And it references attachments you're supposed to include?

A. Correct.

Q. And in this case, you've indicated a design plan and operating and maintenance plan?

A. Correct.

Q. Were those materials included with your C-144 application for each of these wells?

A. Yes.

Q. And do they consist of the flow process and the layout view as well as your operations plan?

A. That is correct.

Q. The top of Page 2, the first half of Page 2, deals with siting criteria?

A. Uh-huh.

Q. And it addresses proximity to groundwater, water

courses, residences, wetlands, et cetera? If you look at the instructional part for the C-144 in bold at the very top of the page?

A. Yes.

Q. Look at the last sentence in the instructions. Does it indicate siting criteria does not apply to drying pads or above grade tanks associated with the closed-loop system?

A. Yes.

Q. And that's what we have in the circumstance of each of these wells; is that correct?

A. That is correct.

Q. Turn to Page 3, Proposed Closure, a place for you to provide information there. In this case, will you have any pits to close?

A. No.

Q. And then let's look at Page 4 of the C-144. It says, "Waste Removal for Closed-loop Systems."

The second box there.

A. Yes.

Q. Does this indicate where Approach plans to haul its drilling fluids and cuttings?

A. Yes.

Q. And where is that?

A. The basin disposal.

Q. Is that a permitted facility by the Division?

A. Yes, it is. And the number is listed here.

MR. HALL: That concludes my redirect, Mr. Examiner.

MR. BROOKS: Recross?

MR. A. TRUJILLO: No, Mr. Hearing Examiner.

MR. BROOKS: Very good. Mr. Hall, you may call your next witness.

MR. HALL: Can we do a time check?

MR. BROOKS: You have 2 hours, 32 minutes, and the County the 26 minutes.

How many witnesses do you have?

MR. HALL: We have one more witness, a technical witness.

MR. BROOKS: That's okay. I was expecting to go beyond 5 o'clock. But you only have one more witness?

MR. HALL: Yes.

MR. BROOKS: Very good. We may break during this witness' testimony, but I think it will be a little early to break now, so --

MR. HALL: If you could allow me just a minute to get organized?

MR. BROOKS: Well, in that case, let's go ahead and take a break, a short one. We'll try and get started again at 4 o'clock.

[Recess taken from 3:55 p.m. to 4:04 p.m., and testimony continued as follows.]

MR. BROOKS: Back on the record. You may call your next witness, Mr. Hall.

PETER MAGGIORE

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

DIRECT EXAMINATION

BY MR. HALL:

Q. For the record, please state your name.

A. Peter Maggiore.

Q. Mr. Maggiore, you have previously been sworn; is that correct?

A. That's correct.

Q. Where do you live?

A. I live in Los Alamos, New Mexico.

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

A. I'm employed by North Wind, Incorporated, and I serve as the senior vice president and manager of the Los Alamos office.

Q. Have you previously testified before the Division or the Commission and had your credentials established as a matter of record?

A. No.

Q. Would you give the Hearing Examiner a summary of your educational background and work experience. And if you

would refer to Exhibit No. 12, please.

A. Yes.

Q. What is Exhibit 12?

A. Exhibit 12 is a recent version of my resume. I hold a Bachelor of Science degree in geology from Stony Brook University that was awarded in 1978. And I hold a Master's degree in geology from the University of New Mexico that was awarded in 1981. I'm a certified professional geologist with the American Institute of Professional Geologists.

During my graduate work, I worked for Conoco Minerals out of Albuquerque doing uranium exploration in the Southern Rockies. Upon graduation with my Master's degree, I was employed for several years with Shell Western ENP out of Houston, Texas where I served as an exploration geologist.

In 1984, I accepted a position with the University of Maine as a research associated and as a member of the graduate faculty teaching a course in X-ray microanalysis and supervising graduate student master's theses.

In 1985, I returned to New Mexico and accepted employment with the New Mexico Environment Department in various capacities through 1989. One of the most relevant one was I managed the groundwater permitting bureau for awhile.

Between 1989 and 1995, I was employed by two separate consulting engineering firms working in the areas of regulatory compliance, hydrogeology, did some siting studies, worked on

some mining projection, municipal water projects.

In 1995, I accepted an offer from then Governor Johnson to become Director of the Environmental Protection Division with the New Mexico Environment Department. In 1998, I became Cabinet Secretary for New Mexico Environment Department. And then in 2002, I left the Environment Department. And since that time, I've worked for two separate consulting engineering firms doing environmental consulting in a wide range of capacities.

Q. In the course of your career at the Environment Department as Cabinet Secretary, did you have the opportunity to become involved in the administration of the Water Quality Act?

A. Yes, I did. In my capacity as Environment Secretary, I served as chairman of the Water Quality Control Commission for four years. That's the commission that promulgates the surface water and groundwater quality standards in this state as well as adopts TMDLs, Total Maximum Daily Loads.

Q. And in that capacity, did you become familiar with the jurisdictional overlap between the Oil Conservation Division and the Environment Department in the administration of that act?

A. Yes, I did.

Q. Are you familiar with the lands that are the

subject of these proceedings?

A. Yes, I am.

Q. And, in fact, have you conducted an onsite inspection of the well locations we've been talking about?

A. As many as I could get to on the day I was there. It was snowing and some gates were locked, but I visited or came close to visiting 9 of the 10 proposed locations.

MR. HALL: At this point, Mr. Examiner, we offer Mr. Maggiore as a qualified expert hydrogeologist.

MR. BROOKS: Any objections?

MR. A. TRUJILLO: No objection.

MR. BROOKS: So qualified.

Q. (By Mr. Hall): Tell us about your site inspection for the these locations. How did you go about locating them?

A. In conjunction with some of the exhibits that you've already seen here today, and with the companionship of a landman from Approach, we basically used the well locations that appeared on the map, along with consultation with the landowners that we could communicate with, to visit these locations.

Q. Now, why is a site visit indicated in this circumstance? How does that help you?

A. Well, the site visit helped me try and understand in real time and directly some of the relationships that I had

come to learn through working through some of the literature and some of the databases associated with getting technical information about this project and about these locations.

Q. All right. Are you familiar with the Division's new Rule 17 regarding pits, closed-loop systems, and below-grade tanks, and pumps?

A. Yes, I am.

Q. What has been the impact of that new rule?

A. I believe the impact of this new rule has caused the oil and gas industry to review the historical practices that they've employed relative to drilling oil and gas wells in New Mexico, particularly with regard to some of the features that you specifically see at a drill site. And it gives them an opportunity to re-evaluate the appropriateness of historical practices given the new regulatory framework.

Q. Does it establish certain criteria for siting requirements?

A. Yes, it does.

Q. And in certain circumstances, does the new rule encourage, in your view, the use of a closed-loop drilling system?

A. Yes, it does, specifically Rule 19.15.10.10 establishes siting requirements associated with specific drilling methods. And the new so-called Pit Rule requires closed-loop systems to be used in certain situations.

Q. Can you briefly identify those to the Hearing Examiner, although I'm pretty sure he knows them.

A. Certainly. I'm referring to the 19 NMAC, Chapter 15, Part 17, titled Pit, Closed-loop Systems, Below Grade Tanks, and Pumps. And Section 19.15.7.10 titled Siting Requirements. And if I might read from Part A, "Except as otherwise provided in 19.15.17 NMAC, operator shall not locate a temporary pit or below grade tank" -- Part A -- "where groundwater is less than 50 feet below the bottom of the temporary pit or below grade tank."

And it goes on to also prohibit temporary pits or below grade tanks in areas within certain proximity to continually flowing water courses, permanent residences, or private domestic fresh water wells.

Q. Now, you've heard from previous testimony that Approach has elected to used closed-loop systems without pits at each of these locations. Did you hear that?

A. Yes, I have.

Q. Is it your understanding that the OCD has required Approach to use closed-loop systems at some of these locations?

A. Yes, it is.

Q. Can you elaborate on that?

A. Certainly. As you've heard others testify, the Oil Conservation Division has previously required at three

locations that Approach Resources use a closed-loop system. I believe those locations are the Sena 1, the Sena 2, and the Woolley No. 1 locations.

It's also my understanding that the OCD based this determination after visiting the site and looking at certain types of vegetation that was observed in the vicinity of the proposed locations, as certain vegetative types may correspond to shallow groundwater occurrences. And that's a fairly standard technique. Approach is supportive of these determinations OCD has made and has readily agreed to adopt the closed-loop drilling system at those three locations.

As I mentioned earlier, by establishing a prohibition against certain drilling practices in certain sensitive hydrogeologic environments, I believe that the Pit Rule actually encourages the use of more protective drilling techniques in areas of environmental sensitivity.

And upon further examination of the requirements of the new Pit Rule, looking at the applicability of these restrictions in certain drilling locations, Approach has decided that the most appropriate and the most responsible corporate decision it could make would be to adopt a closed-loop system at all the proposed drilling locations, essentially going above and beyond what the new Pit Rule requires.

So in short, Approach has agreed to adopt the most

restrictive requirements of Rule 17 for each of the proposed drilling locations.

Q. Now, have you had the opportunity to review Approach's drilling program overall including its casing and cementing program, its pit permit applications, and its plans for rig pads at the associated wells?

A. Yes. I have.

Q. Do you have an opinion whether or not that drilling program plans to use closed-loop drilling rather than the use of pits and can be done in a manner that protects the environment?

A. Yes, I believe it can.

Q. What's the basis of your opinion?

A. The basis of my opinion is that it significantly reduces the potential for drilling fluids and other materials that are used during the drilling process to become released into the environment. By using the tanks, having these tanks above ground, their integrity is immediately obvious.

MR. A. TRUJILLO: Mr. Hearing Examiner, I'm going to object. It appears to me that Mr. Maggiore is reading from something. I'm not sure if he's reading from that, or what it is. But if he is, that's a writing that should be produced to adverse -- opposing counsel so that we may cross-examine him on it. Because I'm not sure if this is free-flowing testimony, because he keeps looking at his notes.

MR. BROOKS: Well, that point is well taken. If he is refreshing his recollection from a writing, then that needs to be made available to counsel. Can you respond to that, Mr. Hall?

MR. HALL: Well, let me just ask the question this way.

Q. (By Mr. Hall): In addition to drilling those wells as Approach plans, to protect the environment, can they also be drilled in a manner that will protect fresh water and protect public health?

A. Yes, I believe so.

Q. How will it do that?

A. It will do that by using the techniques the previous witnesses have described; basically establishing surface casing and cementing off the uppermost layers of the strata that it's drilled through in order to seal off the shallow groundwater environment.

Q. Now, for each of these well locations, have you been able to determine proximity to groundwater?

A. Yes -- well, to the best of my ability.

Q. And how did you go about that?

A. I did that in several -- using a couple of different techniques. The first was to review the information that was submitted previously on the C-101 Forms. I believe that data has been discussed by several witnesses previously.

And I attempted to summarize that data in Exhibit 13.

Q. All right. Let's turn to that. Tell us what Exhibit 13 shows us.

A. Exhibit 13 shows information that I excerpted from the 10 drilling applications that were available to me at the time I put this table together. It shows the name of the well, an approximate township range, section location, and depth to water, proximity to fresh water wells, and surface water, and then some comments that I added.

Q. All right. The comments on the right side, what is the source of those comments?

A. Those are comments that I personally attached based upon a search of the State Engineer's Waters Database.

Q. Okay. And in your search of the Waters Database, approximately how many wells were indicated -- well, first let me ask you this: How did you go about making your search?

A. In looking at the Waters Database, I took a slightly different approach than Mr. Finch did and I don't think there's only one correct approach. There are multiple approaches to try to capture this kind of information.

What I elected to do was to use the proposed individual well locations and then do a Waters Database search for any wells within a one mile fixed radius of those proposed locations. The results of that search appear as Exhibit No. 14. And in instances where water wells were found in the

vicinity of the proposed well locations, or in instances where there appeared to be a surface water course or acequia in the vicinity of the proposed well location, I attempted to include a comment in the far right-hand column on Exhibit 13.

Q. Now, you were here yesterday for the testimony -- I'm sorry, Friday -- for the testimony by Mr. Finch, and you saw the area searched by him, if you recall that.

A. Yes.

Q. Can you show on a map -- one of the map exhibits from your search of the database -- the area that yielded the results for you?

A. Sure. I'm not finding what I'm rooking for.

Q. You want to look at Exhibit 15?

A. Yeah. I think that's what I'm looking for. Okay. I'm looking at Exhibit 15. And this exhibit plots the locations of the proposed Approach wells with the locations of both acequias and domestic water supply wells that were located in the Waters Database search through the Office of the State Engineer.

Q. Okay. Now, when Mr. Finch conducted his search, was he able to identify wells in the proximity you've shown on Exhibit 15?

A. I think Mr. Finch and I might have identified different wells. I don't recall some of the wells that I've identified on this map appearing in Mr. Finch's search, but I

would really need to crosswalk that.

Q. Okay. Were you able to identify surface waters from your site visits?

A. Yes. I was able to identify surface water courses both through the windshield survey and some of the walking around I did and looking at some topographic quadrangle maps.

Q. And the results of that are also shown in Exhibit 15, correct?

A. Yes.

Q. Let's go to Exhibits 8A through 8I. Have you had an opportunity in each of those cases to review the C-144 pit applications --

A. Yes, I have.

Q. -- signed by Approach? Do each of those appear to be complete?

A. Yes, they do.

Q. Now, based on your inspection of well locations, and bearing in mind Approach's plans to use closed-loop drilling systems associated drilling facilities, can each of these well facilities comply with the siting requirements of Rule 17.10, the Pit Rule?

A. Yes.

Q. And is that facilitated by the use of air drilling tools?

A. Yes.

Q. Let's look at Exhibit 16, please. Can you identify Exhibit 16 for us?

A. Yes, I can. This is a map which depicts an area of interest that I selected based upon my review of the Natural Resource Conservation Service website which allows a user to identify and search an area of interest in order to determine soil type.

Q. And how about Exhibit 17?

A. Exhibit 17 is the second part of the map. Unfortunately, the software has an acreage restriction that prohibited me from collecting information from all 70 -- the entire lease area. So I had to separate my search into two separate maps.

Q. Why did you evaluate soils mapping, soils data, in connection with your evaluation of this project?

A. It's important to understand the soil types so you can evaluate erosion potential, potential for flooding, potential for ponding, things like that.

Q. And what soil types were you able to ascertain exist in these locations, and why is that important to the Hearing Examiner?

A. There's about six or seven different soil types. Several proposed well locations have the same soil type. The soil types change as you progress vertically upward through the

watershed. And again, it's important to understand the soil relationships when looking at erosion potential and things like that.

Q. Do these soil types tell you something about the ability of the soils to transmit water?

A. Yes, they do. They -- this database qualitatively evaluates hydraulic saturation potential as well as potential for flooding in ponds.

Q. Let's look at Exhibit 17 -- 16 -- I'm sorry, a little bit closer -- for the location of the -- pick one or two of the locations. The location for the Sena No. 2: What does your map tell us about the soil in the location, in the vicinity of that location?

A. Sure. It's No. 125 and unfortunately, I don't have the precise soil types or characteristics memorized. I would need to refer to some notes for that.

Q. Are you familiar with Mora Loams?

A. Yes, I am.

Q. And are those found in the vicinity of the Sena No. 2 Site?

A. Yes, they are.

Q. And what is the nature of that soil?

A. I know that counselor has objected to me looking at notes, so I can look at them and make that portion available. Basically, they are descriptions that come directly

out the of the NRCS.

MR. A. TRUJILLO: If the witness needs a writing in order to refresh his memory, that's perfectly okay. Just as long he provides me a portion or copy of that so that I can use it.

THE WITNESS: Sure. I can do that.

A. Okay. We were looking at the Sena No. 2 location and the soil type there is the Hogg-Mora Loams, and the soil type, the geomorphology, is typically as hills, and it's derived from shale materials, alluvium. It's listed as a well-drained soil with a moderately low to moderately high capacity to transmit water. And the frequency of flooding -- the frequency of flooding and ponding in this soil is described as none.

Q. (By Mr. Hall): How about the site for the Sena No. 1?

A. Sena No. 1 has a different soil type. It's part of the Rombo-Wiggler Complex. Again, though, the geomorphology is hills. It is derived partly from colluvium, partly from alluvium, but again, from shale. It is well drained, moderately low to moderately high capacity to transmit water. And the frequency of flooding and ponding is described as none.

Q. All right. Why is that important for the Hearing Examiner to note, the frequency of flooding and ponding?

A. I think the frequency of the flooding and ponding

is important for the Hearing Examiner to note because that speaks towards some of the site-specific controls that may need to be put into place to try and mitigate any erosion and runon and runoff from the drill pad locations.

Q. All right. Let's refer over to Exhibit 17 where the location is for the Rosemary Roller No. 1. What sorts of soils occur there?

A. The database lists the Nusmag-Tottles clay loams which occur as stream terraces and foot slopes derived from alluvium that occurs in streams. Again, it's a moderately well drained soil, moderate with very low to moderately low capacity to transmit water. Frequency of flooding and ponding, again, is described as none.

Q. And again, referring back to Exhibit 16, the soils in the vicinity of the Hinkle Well, the Valdez Well, and the Sultemeier No. 2.

A. Those are all part of the Topetaui Complex. These soils typically occur as cuestas which are ridges that have one steep slope and one more gentle slope. Soil type is ultimately derived from shale pathology. It is well drained and moderately low to moderately high capacity to transmit water. Frequency of flooding and ponding is described as none.

Q. All right. And as well for the Sultemeier No. 1, the soil types there?

A. The Sultemeier No. 1 proposed location is the

El Pedro silty loam.

MR. A. TRUJILLO: Mr. Hearing Examiner, could I ask the witness to spell these so that --

THE WITNESS: Certainly. These are not common names.

MR. A. TRUJILLO: I don't find them on this, on the map itself.

THE WITNESS: That's correct.

MR. A. TRUJILLO: And it's difficult for me to --

THE WITNESS: Certainly.

MR. BROOKS: That would probably help the reporter, too.

THE WITNESS: Okay. Let me start at the beginning. Sena No. 2 is Hogg, H-o-g-g, dash Mara, M-a-r-a, Loam, L-o-a-m. Sena No. 1 is Rombo, R-o-m-b-o, dash Wiggler, W-i-g-g-l-e-r. I'm trying to remember what the next one you asked me.

Q. (By Mr. Hall): For the Rosemary Roller.

A. The Rosemary Roller was Nusmag, N-u-s-m, as in Mary, a-g, dash, Tottles, T-o-t-t-l-e-s, clay loam.

Q. And for the vicinity of the Hinkle, Valdez and Sultemeier No. 2 locations?

A. Those three wells were part of the -- I'm pronouncing it Topetaui, but it might not be correct. T, as in Thomas, o-p, as in Peter, e-t, as in Thomas, a-u-i, dash, Hogg, H-o-g-g Complex. And does that bring us up to the Sultemeier?

Q. The Carrick silt loam.

MR. A. TRUJILLO: I'm sorry. Was Hinkle, Sultemeier No. 2 and 1 -- were all those Topetaui-Hogg?

THE WITNESS: The Hinkle, Valdez and Sultemeier No. 2 all appear to have the Topetaui-Hogg.

MR. A. TRUJILLO: Thank you.

THE WITNESS: You bet.

Q. (By Mr. Hall): And the Anthony Garcia Well?

A. The Anthony Garcia appears as a Carrick, C-a-r-r-i-c-k silt loam. And I don't know if we had talked about this yet or not.

Q. Why don't you discuss it briefly.

A. It forms stream terraces that are derived from eolian, which are windblown deposits primarily from volcanic rocks. Well-drained soil, moderately low capacity to transmit water. Frequency of flooding and ponding in the soil is described as none.

Q. And for the location at the Sultemeier No. 1?

A. Sultemeier No. 1 as listed is the El Pedro, E-l and then Pedro, P-e-d-r-o, silty loam. And these deposits typically occur at the bottom of land forms, again from windblown deposits. It's pretty well-drained soil, high capacity for transmitting water. Flooding and ponding in the soil was described as none.

Q. And finally, for the Woolley location?

A. The Woolley location appears to be Angostura,

A-n-g-o-s-t-u-r-a, very cobbly, sandy loam which occurs as mountain slopes, primarily derived from igneous rock. Well-drained soil, moderately high to high capacity for transmitting water. The NRCS lists the frequency of flooding and ponding as none.

Q. All right. Now, given what you know about these soil types, can the rig pad locations and the access roads be constructed so that erosion runoff/runon is controlled adequately?

A. Yes.

Q. And are you familiar with the Division's Pollution Prevention Best Management Practices?

A. Yes, I am. I believe that was published in 2000.

Q. And if Approach follows those best management practices in the construction of its rig pads and wells, can erosion and loss of silt be adequately controlled?

A. Yes.

Q. And it further follows, then, can the wells be drilled in the locations constructed so that water supplies are protected and public health and the environment are further protected?

A. Yes.

Q. Are you -- do you have some familiarity with the BLM US Forest Service Gold Book guidelines?

A. Yes. I believe that was published in 2007.

Q. Is it your understanding that Approach plans to follow the guidelines set forth in the Gold Book?

A. That is my understanding, yes.

Q. Do you believe that's appropriate to help protect the environment and human health and safety?

A. Yes, I do.

Q. Can you talk to us a little bit about surface hydrology? What have you seen out there from your review?

A. As other witnesses have mentioned, the main water course through the -- surface water course -- through the area that we're talking about is the Rito de Tierra Amarilla.

Adjacent to the Rito de Tierra Amarilla is a series of acequias for which the State Engineer has maps on record. And so those are some additional surface water bodies that need to be taken into account. The Chama River sits a ways off to the west. The Rio Nutrius sits further to the south. Of most important interest, the things that I learned the most about, were the -- was the Rito de Tierra Amarillo and the associated ditch systems.

Q. All right. And in your opinion, can the drill site access roads be constructed so there's no interference of those water courses or water supplies?

A. Yes.

Q. Do you know whether a trench and fill permit will be required from the Army Corps of Engineers for any of these

crossings?

A. I haven't fully researched that. Section 404 of the Clean Water Act requires that permits be acquired from the Army Corps of Engineer when activity is being performed in what is termed the waters of the US. That's certainly something that needs to be looked at.

Q. Okay. Now, in your opinion, can the pit locations, onsite burial locations, and drying pad locations be reclaimed in accordance with Division rules?

A. Given that there are no pit locations, no drying pit locations -- and what was the third?

Q. Disposal on site burials.

A. Onsite burials. Since there's going to be no material left, no closure onsite, the answer is yes.

Q. And now, does the dust associated with the use of air tools present any threat to the environment?

A. I don't believe so. I believe the requirements that are established by the New Mexico Environment Department for requiring permits for that is that any dust that is generated from these operations will fall far below those thresholds, yes.

Q. All right. From your background in the industry prior to your career in state government, have you had the opportunity to review casing and cementing programs for oil and gas wells?

A. Not in my former capacity with the Environment Department, I didn't do that, but I did review what was presented.

Q. All right. In your view, is the casing and cementing program proposed by Approach adequate to prevent any risk to fresh water and protect public health and safety and the environment?

MR. A. TRUJILLO: I'm going to object. I don't think that Mr. Hall has established that Mr. Maggiore is competent to testify in that regard. He admitted himself that he hadn't done that kind of work. He did review the materials presented to him. I do not think that's foundation for expert testimony.

MR. BROOKS: Okay. Well, I'll overrule the objection and his qualifications can be further inquired about if necessary, on cross. You may continue.

A. Can somebody repeat the question? I'm sorry.

Q. (By Mr. Hall): Well, let me ask you again.

A. I just -- given the objection, I just want to make sure I understand the question.

Q. Right. Is the casing and cementing program proposed by Approach adequate to prevent any risk to fresh water, public health, public safety and the environment?

A. I believe that the casing and cementing program as presented doesn't completely eliminate, but certainly would be protective of fresh water.

Q. All right. Mr. Maggiore, you were present on Friday for the testimony by the County's experts, Mr. Finch and Mr. Boyle. Let's address the testimony of Mr. Finch in the methodology. And you may wish to refer to County Exhibit 19. Do you have that available to you?

A. I hope so. Yes, I believe I do.

Q. And do you have an opinion whether the methodology utilized by Mr. Finch in the conduct of his investigation set forth in his memorandum is particularly useful to the Hearing Examiner?

A. I think the approach that Mr. Finch used was -- has value. It adds information -- some questions I had with regard to, you know, what the search criteria were. A lot of the wells that were depicted in the database appear to be from subdivisions in the Tierra Amarilla area that were several miles away from the proposed drilling locations. And they may not form the, you know, the best comparison for what we would encounter in the immediate vicinity of the wells that were drilled.

In addition, I'm looking at the conclusions from Mr. Finch's PowerPoint presentation. Mr. Finch recommends prohibiting development to the upper watershed areas. I'm not going to opine on that. That's beyond the scope of my opinion in this hearing. But he recommends implementing hydrologic evaluation before issuing permits. I think, in part, that's

the purpose of the Pit Rule, to establish siting criteria, and to encourage oil and gas operators to use more protective drilling techniques. And I think, certainly in this case, the Pit Rule has achieved that goal.

Mr. Finch recommends using only closed-loop systems in the Rio Chama Watershed. Myself and others have given testimony that that will be Approach's drilling system here. And then finally, Mr. Finch talked about the integrity of the annular seals, and I think we've heard testimony from other experts from Approach on that.

Q. All right. Mr. Finch discussed the impairment to the lower half of the TA Creek. Do you recall that testimony?

A. Yes, I do.

Q. And what do we understand were the causes of that impairment?

A. Do we have an exhibit for that, Counselor?

Q. Let's look at what's been marked as Exhibit 23. Can you identify that for us?

A. Yes. Exhibit 23 is a report dated September 9, 2003, titled, "Total Maximum Daily Loads (TMDLs) for the Upper Rio Chama Watershed (El Vado Reservoir to the Colorado Border)."

Q. Tell me what this document is all about. Did Mr. Finch utilize this document?

A. I'm trying to remember if it was Mr. Finch or if

it was Mr. Boyle. I apologize.

Q. I may be mixed up.

A. One of the witnesses -- it might have actually been Mr. Boyle -- utilized this information. I don't know if he -- I think he did refer directly to this document, because I recall a map in here that we may want to talk about. But I think Dr. Boyle noted that the Rito de Tierra Amarilla has been separated into two segments. And the lower segment has been found to be impaired for free water quality parameters, including turbidity, stream bottom deposits, and temperature.

Q. And what are the causes of that impairment, as we understand it?

A. With the Hearing Examiner's permission, I would like to read directly from portions of this document.

Q. Do you have a page reference?

A. I'm looking at the last paragraph on Page 34, which appears in Section 3 point -- well, it's in Section 3. And it states:

"The primary sources of impairment for this reach identified in the state 303(d) list are range grazing, removal of riparian vegetation, road maintenance, flow regulation/modification, and agriculture. There were no turbidity exceedences observed in the upper Rito de Tierra Amarilla sampling station (Surface Water Quality Bureau Station 15) during the 1998 survey. Increased turbidity at the

lower station (Station 16), likely results from a number of potential factors. There is a change in soil type and geology from the upper station to the lower station in the valley. The main source of impairment along this lower reach appear to be from livestock grazing and removal of riparian vegetation in the floodplain upstream from the lower sampling stations. Agricultural practices such as grazing appear to have contributed to the removal of riparian vegetation and stream bank destabilization. Field staff observed several horses, colts, and cattle while taking measurements at the lower sampling station. There are several small animal confinement pens, irrigation return flow, and poorly designed culverts at road crossings." And they list the reference.

"The reach flows through Tierra Amarilla in which all of the above factors are concentrated. When the area was first settled, creating narrow strips from the road all the way to the stream so each family's livestock would have access to a water source broke up the land. In many instances, these plots have been completely cleared of vegetation what would have filtered out sediments before reaching the stream. Direct access of livestock to the stream banks has caused stream bank destabilization in many areas."

And the final paragraph concludes, "The channel appears to have an increased width-to-depth ratio throughout this lower portion of the Rito de Tierra Amarilla as a result

of the above-mentioned land use practices. Given the low valley slope at the lower station, the channel should be narrower and deeper, which would transport sediment more efficiently." And it gives a reference for that statement.

Q. Is it correct to say that present and past land uses for the area contributed to the impairment condition of the TA Creek?

A. Yes.

Q. Is there any indication that the past mineral development from the coal mines that were discussed or the old oil wells contributed?

A. No, there is not. It was interesting in the figure that Dr. Boyle showed in his map, and it's in this document somewhere, there was at least four or five mine symbols that appeared to be in relative proximity to the Rito de Tierra Amarilla. But those features were not noted as a source of the potential impairment that's been observed.

Q. And you're referring to one of the maps that was presented to us in Dr. Boyle's PowerPoint presentation?

A. Yes, I am.

Q. Let's discuss erosion. I believe Mr. Finch discussed erosion in his testimony on Friday. What effect has erosion had on the current quality of TA Creek?

A. Erosion has degraded the qualities of the Tierra Amarilla Creek. As I understand it, it has caused a higher

percentage of silt and fines that you might otherwise find in the creek. That, in part, has caused the creek geometry to change as noted in the information I read. And I believe that phenomenon also is partly responsible for the temperature impairment which the lower stretch experiences.

Q. Did agricultural practices contribute to erosion?

A. Yes, as they noted here. They talk about return flows from agricultural practices. My previous experience on the Lower Rio Grande in potential litigation with the State of Texas, their main concern with the State of New Mexico was the quality of the water. Particularly, the turbidity was higher than they would like to use for a drinking water source. And the turbidity source was determined to be the tails water, or the return flow, from a lot of the irrigated fields along the Southern Rio Grande. It appears that a similar type of phenomenon, although on a much smaller scale, may be occurring.

Q. In your inspection of the lands and proximity of these well locations, did you observe whether any disking or any plowing had occurred?

A. When I visited, unfortunately, there was a fair amount of snow on the ground. But I understand that historical practices certainly, in addition to some of the testimony I've heard -- that those practices do occur.

Q. Mr. Finch discussed a number of the Water Quality Control Commission regulations and designations for the area of

the TA Creek. Do those designations actually restrict the use of the land?

A. No, they don't.

Q. What is their purpose?

A. They're basically -- as I understand them, those designations are basically targets or goals, but they do not have any direct relationship towards facility siting or land use practices.

Q. Mr. Finch noted that they did not conduct site inspections, but I believe both he and Mr. Boyle recommended that specific site inspections be done. Do you agree?

A. I agree that it's a good idea to get out there and look at the land and look at where these proposed locations are and to get a first-hand knowledge of what's on the ground. You bet.

Q. And do you recall Dr. Boyle was recommending that risk-analyses should be conducted for each of these sites? Can you explain to the Hearing Examiner what is a risk assessment? How is that useful?

A. The way I have seen risk assessments be done -- and I believe he might have used the words "formal risk assessment" -- those are typically very sophisticated, very time consuming --

MR. A. TRUJILLO: At this point, I'm going to object until Mr. Maggiore can establish -- or Mr. Hall can establish

the foundation for this testimony. I did not know that Mr. Maggiore was qualified in risk assessment or toxicology or anything that would qualify him to interpret Dr. Boyle's testimony.

MR. BROOKS: Well, testimony included testimony that he served as Secretary of the Environment Department, and I'm sure he couldn't have been in that position without acquiring some knowledge of that subject.

MR. A. TRUJILLO: Mr. Hearing Examiner, I think that at least needs to be developed for the record.

MR. BROOKS: I'll overrule the objection. You may testify.

A. In my experience, the way I've seen formal risk assessments utilized is primarily in the federal arena, looking at US Department of Energy disposal sites. The DOE is self-regulating for certain contaminant or pollutants and their orders direct the Department of Energy to do formal risk assessments when certain wastes will be left on site for extended periods of time.

In those instances, it's important to understand the relationship that that variable will have in terms of potential receptors -- not only now, but well into the future. Again, those are very formal, very extensive, very long-term types of studies that are done for waste sites that essentially may be at a location in perpetuity.

Q. (By Mr. Hall): So "formal risk assessment," is that a regulatory term?

A. I'm trying to recall if I've seen risk assessment requirements. I know it's a term that's used in the regulatory arena with the DOE, so I would say yes.

Q. Would the conduct of a formal risk assessment in this case be of any value to the Hearing Examiner in making his decision?

A. I don't believe so.

Q. How long do formal risk assessments typically take to conduct?

A. The more complicated ones can take several years.

Q. Are you familiar with the Boulder Field of the West and East Puerto Chiquito Mancos Field?

A. Anecdotally.

Q. Are you familiar with any reported surface water or groundwater impacts from that development over there?

A. I am not.

Q. Anything further with respect to the testimony of Dr. Boyle on Friday?

A. Dr. Boyle also noted that in addition to turbidity, stream bottom deposits and temperature were listed as water quality parameters that caused the lower Rito de Tierra Amarilla to be impaired. And there is similar language in this exhibit with regard to the New Mexico Environment

Department and the Water Quality Control Commission's understanding of what's causing that impairment. I didn't know if you wanted me to --

Q. Can you point that out to us?

A. Sure. In Section 4 of the referenced exhibit on Page 42, the last paragraph again, talks about the causes for the impairment with respect to stream bottom deposits. Would you -- Counselor -- Mr. Examiner --

Q. Go ahead and summarize it, please.

A. Okay. Basically, the causes for this impairment are very similar to the causes that were noted previously with regard to turbidity. They note the change in soil type and geology. Then they note the impairment being -- appears to be from livestock grazing and the removal of the riparian vegetation in the floodplain. They attribute that to agricultural practices such as grazing.

Again, they note the occurrence of livestock immediately in the vicinity and in the water course. They talk about irrigation return flows and poorly designed culverts. And they actually have a photograph showing livestock immediately on the banks of the Rito de Tierra Amarilla. They're not fenced out, anyway. This all contributes to the stream banks' destabilization and erosion and impairment.

Q. All right. Both, I believe, Dr. Boyle and Mr. Finch indicated that from their observations of available

materials that many of these locations were down gradient, hydraulically, from some surface loads. Can you comment on that? Is that important for the Hearing Examiner to know?

A. Well, a lot of these futures are down gradient and so one would need to take that phenomena into account during siting and during, you know -- during the siting on where to locate the road, how to construct the road, where to locate the drill pad, how to build the drill pad, so that you can attempt to mitigate using the best practices that we talked about -- you know, erosion, runon, runoff, things like that.

Q. You've concluded that Approach can take into consideration the down gradient conditions for each of the well locations in constructing its road in its well locations?

A. Yes, I believe they can.

Q. Anything further you wish to add, Mr. Maggiore?

A. One possible other addition. Again, in the TMDL report, Dr. Boyle noted an impairment parameter being temperature. And on Page 72 of the report are some pictures and a discussion of the impairment. And if I may summarize or briefly read from that:

"The main sources of impairment appear to be from livestock grazing and removal of riparian vegetation in the floodplain up stream of the lower sampling station."

And why it's important here with regard to destruction of riparian habitat, is riparian habitat will

assist in shading the creek, and that shade will assist in reducing the potential temperature rise. When you remove that riparian vegetation, you have the sun being able to directly impinge on the surface of the water. And when you combine that with the other practices that are noted, including the finer material causing the riverbed to widen, you're not only increasing the surface area that's available to sunlight, but you're reducing the potential for shade at the same time. That appears to be the reason for the temperature impairment.

Q. All right.

MR. HALL: At this time, Mr. Examiner, this concludes our direct of Mr. Maggiore. We move the admission of Exhibits 12, 13, 14, 15, 16, 17.

Q. (By Mr. Hall): And let me ask you with respect to Exhibit 23, Mr. Maggiore, what is the source of this publication?

A. This is Exhibit 23. I apologize. This is the -- the source of this is the New Mexico Environment Department Surface Water Quality Bureau. It's available on their website.

Q. And again, this was referred to by Dr. Boyle. And did you take this into consideration in reaching your conclusions?

A. Yes, I did.

MR. HALL: We'd also move the admission of Exhibit 23 and also ask the examiner to take administrative notice of the

Division's Pollution Prevention Best Management Practices publication.

MR. BROOKS: Okay. What were the exhibits again? You said 15 through --

MR. HALL: 12, 13, 14, 15, 16, 17 -- 12 through 17.

MR. BROOKS: 12 through 17, and 23?

MR. HALL: 23.

MR. BROOKS: Any objections, Mr. Trujillo?

MR. A. TRUJILLO: No objection.

MR. BROOKS: Okay. 12 through 17 and 23 are admitted.

[Respondent's Exhibits 12 through 17 and 23 admitted into evidence.]

MR. BROOKS: There was the issue of the examination of Mr. Maggiore's notes and to allow some time to deal with that.

MR. HALL: We'll provide that portion of his notes.

MR. BROOKS: Okay. We will take a 15-minute recess to deal with that issue.

[Recess taken from 5:02 p.m. to 5:15 p.m. and testimony continued as follows:]

MR. BROOKS: Let us proceed.

MR. A. TRUJILLO: I would rather not proceed until I can at least tell the people in the hallway that we're proceeding, because it breaks my concentration when everyone is

walking in late.

MR. BROOKS: My time here indicates that the County has 28 minutes remaining, so we can round that off to 30 minutes just to make sure I'm accurate.

MR. A. TRUJILLO: Thank you, Mr. Hearing Examiner.

MR. BROOKS: I'm not sure I'm totally accurate, so I'm rounding to be within accuracy. You may proceed when you're ready.

CROSS-EXAMINATION

BY MR. A. TRUJILLO:

Q. Mr. Maggiore, are you testifying here today on the record that it is your recommendation that an oil and gas well be placed in an alpine wetland?

A. I'm testifying that I believe that closed-loop systems meet the OCD regulatory requirements and can be placed at the proposed drill sites.

Q. I see. So you're testifying that -- you're not testifying that it's your recommendation to place that there?

A. Your question focused on a definition or a designation of an alpine wetland at one of the locations. The only information I've seen regarding that designation was the presentation by Dr. Boyle yesterday.

Wetlands has a specific -- it's my understanding that wetlands has a specific regulatory definition. And I am not certain that the well site that you are referring to meets that

definition.

Q. Okay. Let me ask you: You visited the Woolley Site, did you not?

A. I did visit the Woolley Site.

Q. And did you see the springs on either side of the stakes?

A. No, I did not.

Q. You didn't walk 40 feet over from the stake to see if there was a spring there?

A. As I testified earlier, I did a windshield survey. I also did some hiking. But the day I was up there, it was snowing.

Q. And what month was that?

A. This was June.

Q. And there was snow on the ground?

A. There was snow on the ground.

Q. There was enough snow on the ground to prevent you from walking down to that site?

A. I did not have time to walk over every site in detail. I didn't go that far.

Q. So you don't -- so you're saying, then, that you don't know if there are headwater springs at the Woolley Site?

A. I did not personally observe headwater springs at the Woolley Site. I did see photographs that Dr. Boyle presented that showed ponded water in some of the locations at

that turnout.

Q. So it's your recommendation that an oil well be placed in that site?

A. I believe I've already answered that question.

Q. Well, is it your recommendation, then, that an oil well be placed in the mouth of a box canyon drainage?

MR. HALL: Can you specify the well location for us?

Q. (By Mr. A. Trujillo): Sultemeier 1?

A. I visited that site, and I believe that can accommodate an oil -- an exploratory well, given the practices that are outlined in the application.

Q. But is that the site that you would recommend that a well be placed at?

A. I'm not -- I have not been asked to recommend sites. I have been asked to review the sites that have been proposed and render a professional opinion.

Q. So you've been asked to justify the placement of the sites after the fact, then?

A. I've already answered that question as well.

Q. I don't believe you have, because this is the first time I've asked it.

MR. HALL: Object. Argumentative.

MR. BROOKS: I think it is argumentative. I'll sustain the objection. Go ahead.

Q. (By Mr. A. Trujillo): Now, I'm confused about

your testimony regarding impairment of the Tierra Amarilla Creek. You're not comparing oil and gas development, and risk of contamination involved in oil and gas development, with agriculture, are you?

A. I don't believe I made that comparison.

Q. I'm trying to get to what the testimony means. And you're not --

A. My testimony was completely factual, and I read from documents that have received approval and adoptions by the Water Quality Control Commission and the US EPA. Those are their words, not mine.

Q. That's correct. Now, you're not testifying, then, that oil and gas development is comparable to the impairment and effects of agriculture and rangeland grazing, are you?

A. I didn't make any comparisons.

Q. Okay. And there are no active oil wells in the area that you know of, are there?

A. Not to my knowledge.

Q. And there are no active mines in this area, are there?

A. I do not believe so.

Q. And in essence, then, the cause of impairments are the only activity -- the causes of impairment are the only activity in this area, aren't they?

A. I don't understand the question. I'm sorry.

Q. Well, we have agriculture there; do we not?

A. Yes.

Q. And we've got rangeland grazing; is that correct?

A. Those are a couple of the land use practices I understand exist, yes.

Q. And what other land use practices exist there?

A. Well, in terms of the impairment, are you --

Q. Yes. I'm asking about impairment.

A. Well, if I might refer back to the appropriate sections of the report. In terms of the impairment for turbidity, Exhibit 23 says that the main sources of impairment along this lower reach appear to be livestock grazing and removal of riparian vegetation in the floodplain, agricultural practices such as grazing, removal of riparian vegetation and stream bank destabilization.

Again, livestock has unfettered access to the streams, irrigation return flow. Which again, I tried to explain was -- can result from soil loss from the fields and the tails water or return flow going back into either the acequia or the creek. And poorly designed culverts at road crossings were listed, for example, as the most probable courses of the turbidity impairment.

Q. I see. And the proposed applications, they will only add to that impairment, will they not?

A. Any --

Q. I mean, you're not telling us that there's going to be no effect, are you?

A. What I'm telling you is that on 100 percent private land with no commercial development, the lower reach of the Rito de Tierra Amarilla has become impaired.

Q. And that's it? Like I said, you're not telling us that these proposed well sites will have no effect on the streams, are you?

A. I'm not predicting what potential future activities or impacts might be. What I'm trying to do is place the testimony that previous witnesses gave with regard to the impairment status of the Rito De Tierra Amarilla in the context of the document within which those impairments were described.

Q. Well, you're familiar with the National Resource Conservation Service, are you not?

A. Yes, I am.

Q. And you're aware through prior testimony and probably just through your own basic knowledge, that the National Resources Conservation Service is currently in the process of remediating as much impairment through livestock grazing and agriculture in this area as possible, are you not?

A. Yes -- well, as much as possible. I don't know what the level of -- I can't testify as to the level of effort. A previous witness shared a photograph which showed some field

or agricultural rehabilitation. Some types stabilize and reduce some of the erosion. So that's -- I've seen a photograph of that.

Q. So basically, what's happening in this area is there are current attempts to remediate the already present erosion and impairment of those streams; is that correct?

A. Yes. There's activities undergone to try and come into -- to try and meet the requirements of the TMDL like there are at the, I believe, 99 impaired reaches of creeks and surface water courses in New Mexico.

Q. So while this remediation is taking place, it's your recommendation, then, that oil wells be placed in this vicinity?

MR. HALL: Again, Mr. Examiner, this has been asked and answered.

MR. A. TRUJILLO: I don't believe it has.

MR. BROOKS: Overruled.

A. If you look at the definition of a TMDL, the definition of a TMDL does not anticipate no future development or no future activity in the watershed wherein the impairment occurs. And if you'd like, I can try and find that definition. I don't have it memorized.

Q. (By Mr. A. Trujillo): No, no. I don't want a definition. I want an answer to the question.

A. Well, I think the answer to your question is best

described in the definition of the TMDL. So, if you'd like --

Q. It's a yes or no answer.

A. I believe --

Q. I'm asking in this context: When this remediation is taking place, it's your recommendation, then, that oil and gas development be placed in that area?

A. My recommendation -- my opinion is consistent with the definition of the term TMDL, which does not restrict or eliminate -- which does not eliminate future development in a water course under which a rehabilitation is occurring pursuant to an impairment designation.

MR. A. TRUJILLO: I will object as non-responsive.

MR. BROOKS: One of the problems with argumentative questions is they often draw argumentative answers. So I will overrule the objection.

Q. (By Mr. A. Trujillo): Now, in your capacity as Secretary of the New Mexico Environment Department, are you aware if injection of contaminants is allowable into a fresh water aquifer?

A. I am aware of a -- that groundwater cannot be degraded above numerical groundwater quality standards which the Water Quality Control Commission sets. And that is the underpinnings that the Water Quality Control Commission regulations have, and the groundwater permitting program has.

Q. I see. So you did hear the testimony from

Mr. Craft, I believe, that indicated that Approach plans to reinject the produced water into the aquifer, does it not?

MR. HALL: I'm going to object. I think that mischaracterizes prior testimony. I believe the testimony was it would be reinjected back into a producing formation which has associated oil and water in it already for pressure maintenance.

MR. BROOKS: Well, I believe that's correct, as I recall the testimony. So I'll sustain the objection.

Q. (By Mr. A. Trujillo): So what formation does the Cloyd Hinkle Well yield water from?

A. I don't know the answer to that offhand. I believe it's one of the deeper wells.

MR. HALL: I'm going to object to the form of the question. The well has not been drilled.

MR. BROOKS: Well, I thought he was inquiring about the Cloyd Hinkle Well that is part of the summary that the witness sponsored; is that not correct?

MR. A. TRUJILLO: I believe if I can rephase the question:

Q. (By Mr. A. Trujillo): What formation does the Cloyd Hinkle water well yield water from?

MR. BROOKS: That's what I thought you meant.

A. And that's how I interpreted your question. I don't believe I --

Q. (By Mr. A. Trujillo): Go to your Exhibit 15. The depth of that well is 820 feet; is that correct?

A. Yes.

Q. And so what formation does that well yield water from?

A. I don't know.

Q. Could it be the Mancos Shale?

A. I would doubt it's the Mancos because I don't think that the Mancos is typically an aquifer in this area. But again, I don't know. I would be surprised if it was the Mancos.

Q. Now, you didn't review the Rio Chama Regional Water Plan in preparing your analysis for this, did you?

A. I reviewed the executive summary. I'm aware of the document, but I didn't review it in detail, no.

Q. And that plan can be significant in terms of understanding the local issues in these applications, couldn't it?

A. I would agree that that document would give insight to the local values associated with the watershed, sure.

Q. And the Rio Chama Regional Water Plan addresses the restoration issues involved in the Rio Chama Watershed, doesn't it?

A. I believe it does, yes.

Q. In the context of that, we're here for oil and gas development in the regional watershed; are we not?

A. I don't believe that we're here in the context of the Rio Chama Regional Water Plan. I believe we're here in the context of the Oil Conservation Division regulations pursuant to drilling applications that have been submitted by Approach Resources.

Q. I see. Well, the Rio Chama Regional Water Plan has as its purpose the restoration in this regional watershed. And the placement of oil and gas development in that watershed would necessarily degrade the quality of the water in the Rio Chama Watershed, would it not?

A. I don't believe I --

Q. Oil and gas development will necessarily degrade the water quality in the Rio Chama Watershed, would it not?

A. Oil and gas development could impact it. I don't think it's an unequivocal fact that it will.

Q. But there's no guarantee that it won't; is that correct?

A. Sure.

Q. In fact, if any of the facts that have come to light today regarding these spills were to occur in this watershed, the results could be potentially catastrophic.

MR. HALL: I'm going to object. This is speculation at this point, Mr. Examiner.

MR. A. TRUJILLO: Mr. Maggiore was former Secretary of the Environment Department in which capacity he dealt extensively with contamination issues of all types.

MR. BROOKS: Well, I'll overrule the objection. The witness may answer the question if he has an opinion on that subject.

A. I don't know if I would share your use of the word catastrophic, but I would acknowledge that if releases occurred in the watershed, impacts could occur.

Q. (By Mr. A. Trujillo): Well, if 10,000 gallons of crude oil and mostly gas well liquid were discharged into the soil in the Rio Chama Watershed, can you give us an idea of what kind of problem that would create?

MR. HALL: Well, I'm going to object again. Assumes facts that are not in evidence.

MR. A. TRUJILLO: I believe --

MR. BROOKS: It's a hypothetical, and I think it's a reasonable one that can be asked of an expert witness. Overruled.

A. The volume again, was what -- 10,000 gallons?

Q. (By Mr. A. Trujillo): 10,000 gallons.

A. Of --

Q. Of toxic -- of gas well liquids --

A. Was discharged where?

Q. -- and crude oil -- was discharged in the

headwaters and along the Tierra Amarilla Creek.

A. That might meet my definition of catastrophic.

Q. Okay. Now --

MR. BROOKS: Did you say it might or might not?

THE WITNESS: It might.

Q. (By Mr. A. Trujillo): Now, the purpose of categorization of the upper reaches of the Tierra Amarilla Creek to about 8,000 feet as defined by the EPA as unimpaired, you're familiar with that designation, are you not?

A. Yes, I am.

Q. And the purpose of that designation is to not allow any further degradation; is that correct?

A. I don't believe that's correct. I believe that development can occur consistent with that designation.

Q. And do you have any proof to that effect here for us today?

A. Well, there's no development -- there's little development. What I'm saying is there is no prohibition. There's no regulatory prohibition against development that would be caused by that designation, as I believe you're implying.

What I'm saying is that designation does not restrict or eliminate certain land use practices. And one such land use practice is being proposed here.

Q. Okay. So you're saying that an allowable

practice in an EPA designated area for unimpaired water would be oil and gas development?

A. What I'm saying is that I believe that the specified drilling locations, using closed-loop systems, using best practices as defined by the Gold Book, using best practices as defined by the Oil Conservation Division's publication, that those locations can be developed in a manner that is protective of the public health and environment.

Q. That is protective or that is preventative?

A. That is protective of the public health and the environment. Many of the practices that are called out in the Gold Book are preventative practices, okay? When they discuss removing topsoil, for example, and then placing it back; when they talk about considering irregular drill pad geometries; when they talk about looking at road construction in a manner that minimizes future -- minimizes erosion and future reclamation. Those are all good things.

Q. Do you still have your exhibit book open to Exhibit 15?

A. I'll find it. Is that the water well map?

Q. Yes, it is. Now, it appears to me that if you look at the left-hand corner at the Cloyd Hinkle No. 1, there appears to be a water well almost on top of Approach's proposed site -- very near it; is that correct?

A. The map suggested that. And let me --

Q. Can you tell us how far away that is?

A. I don't know the answer to that. You've heard previous testimony that some of the lat/long township range section locations may not be accurate because of the historical lack of surveying in this area.

So what I attempted to do was take the information from the Waters Database and basically try and project it using the best professional judgement that we have. The next logical step, in my opinion, would be to take this data and then see if it can be ground truth, try and find out where these wells might actually exist or not exist.

Because sometimes when you're looking at section quarter section/quarter section and you're just plotting stuff in the center all the time, you're not hitting it where it really is on the ground. So these are estimates. And this isn't -- I wouldn't portray this has being 100 percent accurate.

Q. Well, the question I have is there appears to be three water wells directly in the vicinity of the Cloyd Hinkle well site application for Approach; is that correct?

A. This map certainly suggests that, yes.

Q. Now, do the Pit Rule siting requirements prohibit the drilling of a well location in a wetland or next to a water well?

A. I'm referring to --

Q. Let me modify the question: With a closed-loop system, do they prohibit the drilling of a well location in a wetland or next to a water well -- with a closed-loop system?

A. With a closed-loop system, I don't see the prohibitions you just mentioned.

Q. So basically with a closed-loop system, you can place an oil and gas well anywhere?

A. With a closed-loop system, I do not see a siting prohibition.

Q. Mr. Maggiore, listen to the question: With a closed-loop system, you can place an oil and gas well anywhere?

A. That's what the regulations appear to suggest.

Q. And so it's your opinion, then, that with a closed-loop system, you can place an oil and gas well right next to three water wells?

A. I do not see a regulatory prohibition against that.

Q. But it is recommendable? I mean, would you recommend that you place an oil and gas well next to three water wells?

MR. HALL: Again, it's argumentative.

MR. A. TRUJILLO: I'm sorry.

Q. (By Mr. A. Trujillo): Would you recommend --

MR. BROOKS: Overruled. He can answer the question if he has an opinion.

A. I don't know if those water wells are in those precise locations. The purpose of doing this survey was an attempt -- a good faith attempt -- to try and identify the locations of water wells within a mile vicinity of these proposed locations.

Q. (By Mr. A. Trujillo): So what you're saying, then, is that we need to find out if those water wells are right there, then?

A. That would be a good practice, but you interrupted me. I do not see a regulatory requirement to do what I did on behalf of Approach because of their use of a proposed closed-loop system.

Q. That seems like a flaw in the siting of these wells, wouldn't you say? Wouldn't you say -- I'm sorry. Let me withdraw my question.

Wouldn't you say, then, that the siting requirements in these -- in the Pit Rule -- would actually allow for oil and gas development in places that would pose a considerable risk to water supplies because there's no regulation of them?

MR. HALL: I object. It asks the witness to assume that there's no regulation of them.

MR. A. TRUJILLO: I'm sorry. He just said that he sees no regulatory authority for not placing these wells --

MR. BROOKS: I think it's repetitious, but I'm going to overrule the objection.

A. I believe what I said was I did not see a regulatory prohibition. With the use of a closed-loop system, the level of protectiveness is so much greater, in my opinion, than with below ground pits, with below ground tanks, with liners, with onsite disposal, onsite closure -- none of which will be occurring here -- that I believe that these locations can be drilled safely.

Q. (By Mr. A. Trujillo): Okay. So that gets to the point. The point is then -- or one of the points is that with a closed-loop system you're saying it's okay to drill 40 feet away from the headwaters of the Rio Chama Watershed.

A. I've not seen a map that clearly depicts the headwaters of the Rio Chama Watershed.

Q. Okay. So assuming that Mr. Boyle's photos or photographs are accurate regarding the distances and regarding the locations of those springs, you're saying, then, that with a closed-loop system, it's allowable to place an oil and gas well 40 feet from naturally occurring springs that serve as the headwaters for the Rio Chama Watershed?

A. I also don't know when that photo was taken. I don't know --

Q. Mr. Boyle testified that he -- Dr. Boyle testified that he took them two weeks ago; did he not?

A. I may have forgotten that portion of the testimony.

MR. BROOKS: Okay. Two things: First of all, you need to allow the witness to complete his answer. But you have five minutes remaining.

A. What I was trying to articulate was that whenever that photo was taken -- and if it was two weeks ago and I didn't realize that, I apologize -- I don't know what that looks like at other times of the year. There may not be water ponding there the whole year. That may be a short term phenomena relative to the runoff, relative to springs, things like that.

Q. (By Mr. A. Trujillo): Hypothetically speaking, if Approach had come to you in September of 2007 and said, "We want to do a hydrological study. We want you to tell us if you think this location or any of those locations is suitable for oil and gas development, and if there are other locations that are possible."

Would you have recommended these locations over other possible locations?

MR. HALL: Again, there's no foundation. It calls for speculation.

MR. A. TRUJILLO: I don't believe it calls for speculation. I'm placing a hypothetical to an expert witness saying that if he would actually recommend someone place an oil well in any of those locations if there was a better alternative.

MR. BROOKS: I think that I'm going to sustain the objection because I don't think he was asked to do that from what I understand of his mission. And I don't believe there's been any evidence of alternative locations submitted in this proceeding.

MR. A. TRUJILLO: I believe there has, Mr. Hearing Examiner.

I have no further questions.

MR. BROOKS: Okay. I do have some questions, however.

EXAMINATION

BY MR. BROOKS:

Q. Like Mr. Trujillo, I'm very concerned about the Cloyd Hinkle water well, but I gather you don't really have very much knowledge about it; would that be fair to say?

A. That would be fair to say. The extent of my knowledge is the information that was publically available on the Waters Database through the Office of the State Engineer.

Q. You haven't made any actual inquiries as to whether that well is still active, whether it's being used, et cetera?

A. I made no inquiries with regard to either the use or precise location.

Q. And you don't know how far it is from the proposed Cloyd Hinkle No. 1 well site?

A. I do not. All I'm suggesting is that if anybody in this room accessed the database and tried to plot that data on a map using standard techniques, that's where the well would fall out.

Q. Okay. I guess that's all that I have. All these other wells that you had plotted appear to be relatively shallow, although the Roy Martinez Well is very close, also, to the Cloyd Hinkle Well, correct, -- or somewhere in the general vicinity?

A. That's correct. That appeared to be on the west side of US 84.

Q. And that well depth is at 350, which is right at the proposed surface casing setting depth?

A. That's correct.

Q. And now, let's see. Where's this William Sultemeier Well that's listed on here? I didn't plot that on the -- I didn't look at that.

A. That well was --

Q. Yeah. I see where it is.

A. It's one of the southern-most wells. It's southeast of the proposed Sultemeier No. 2.

Q. But you haven't plotted any of these wells where you can tell us exactly how far they are from the proposed locations, correct?

A. No, I haven't.

Q. Okay. Now, Mr. Trujillo asked you a bunch of questions about the site where the spring was. Which one was that, Mr. Trujillo?

MR. A. TRUJILLO: My recollection is that it's the Woolley Site.

MR. BROOKS: Okay. I believe that's what you had asked about.

Q. (By Mr. Brooks): In your evaluation -- well, first of all, I'm not sure I remember the testimony for sure. Did you make an evaluation of the sufficiency of the proposed runon/runoff prevention measures that Approach is proposing?

A. Not quantitatively. I looked at the best practices identified in the Gold Book and the Oil Conservation Division best practices book.

Q. Okay. And did you give us an opinion that those measures would be adequate under normal circumstances to prevent runoff and runon to prevent communication between the well site and the watershed?

A. I gave testimony with regard to my opinion of the integrity of the well casing and the cementing.

Q. Yeah.

A. Yes. And I thought that would --

Q. What about the site protective --

A. The site protective, there would need to be some -- if the proposed well pad construction and drilling

occurred at the time, or the surface conditions were as those that Dr. Boyle presented, there would have to be some fairly significant mitigation with regard to trying to make that a site where --

Q. I'm sorry. I didn't mean to interrupt.

A. No. There would need to be a fairly robust amount of mitigation.

Q. Now, you're talking about the Woolley Site or are you talking about these sites in general?

A. I'm talking about the Woolley Site, specifically. I thought that's what we were referring to. I'm sorry.

Q. And you say "robust mitigation." Do you mean in addition to what is recommended, over and above what is recommended generally in the Gold Book?

A. Well, within the Gold Book they talk about, as I recall, you know, mitigating erosion and runon and runoff and they mention wetland areas. And I think it's safe to assume that a higher level of effort would need to be supplied in those types of environments than there would if you were, you know, at one of the other locations.

Q. You were talking about wetland having a specific regulatory definition. I guess I'm not really aware of one. Are you thinking in the New Mexico Environment Department definition or regulations?

A. I'm not sure precisely where that definition is.

I'm just trying to exercise caution with regard to the use of the term in a casual manner. Because I know that wetlands have some fairly specific requirements attached to them in certain regulatory framework, and I try to defer to those definitions and frameworks.

Q. Of course, the 401 permit is only required if it's within jurisdictional waters.

A. I believe the term is "waters of the US."

Q. Yes. Unless Congress has changed it. I know there's a bill pending there, but I don't know -- I might not hear right away if it passed.

A. I believe you're correct.

Q. That's a very complex issue that the OCD really doesn't need to be concerned about, because I figure it's up to the feds to enforce their own rules. But we do need to be concerned about whether it's in an area that requires special mitigation measures.

A. I would agree. And that is prescribed under the Clean Water Act.

Q. Okay.

A. The Federal Clean Water Act.

Q. I guess that's really all I have for you.

MR. BROOKS: I'm going to want to recall Mr. Reed for a few questions after this witness is completed. But I will allow you to do a redirect, Mr. Hall.

REDIRECT EXAMINATION

BY MR. HALL:

Q. Mr. Maggiore, you were asked a number of questions with respect to your understanding of the operation of the siting criteria under the Pit Rule and the ability of an operator to locate a well in close proximity to a water well. Isn't it -- Pit Rule not withstanding -- isn't it true the Oil Conservation Division has additional rules and regulations that prohibit the pollution of water outright?

A. Yes.

MR. HALL: That's all I have.

MR. BROOKS: Since I asked a number of questions, I'll give you five minutes if you want to take him on redirect -- I mean, recross.

RECROSS-EXAMINATION

BY MR. A. TRUJILLO:

Q. So special mitigation managers would be required, then, for a site such as Mr. Woolley's?

A. I believe I testified that I would expect a more robust series of mitigation efforts would be appropriate for a location like that.

Q. What about Mr. Sena's where he is 200 feet from -- or Sena No. 2 where a spring is 250 feet from a well site? Would that require special mitigation measures?

A. I don't know. I would need to look at what the

flow is, what the seasonality is when we're looking at drilling the well. There are a lot of other considerations.

Q. What about Sena No. 1? That is 200 yards away from an impoundment and is located in a natural drainage that runs every year. Would that require special mitigation managers?

A. Well, I would need to look at what the status of -- if it's a water course, what the flow is, what the seasonality of it is. It may or may not. I don't have enough information to answer that definitively right now.

MR. HALL: Mr. Examiner, I want to make sure I heard the question correctly. He said it calls for a special mitigation manager?

MR. A. TRUJILLO: I belief that this testimony was from -- well, actually, the term was used by the Hearing Examiner in terms of some kind of oversight of some of these well sites that are placed in delicate areas.

THE WITNESS: I apologize. I didn't --

MR. BROOKS: No. You may have misunderstood what I said. I was tracking what the witness said, and the witness said "special mitigation measures," as I understood, and that was the question I asked.

THE WITNESS: And that's what I responded to. I didn't understand that to be a personnel or organizational term. I understood that to be a level of effort term.

Q. (By Mr. A. Trujillo): And that's what I -- I'm not using it as special personnel. I'm using it in terms of a special -- and what would that special effort come from?

A. Well, what I would envision is to continue with the literature search, but also to consult with the landowners and the people on the ground that are the most familiar with that land and most familiar with the phenomena of the springs or seasonal runoff or acequia flow and things like that, and request that they work collaboratively in supplying information so that we can make the best decision possible.

Q. And in the event that we've had landowners testify that these are not some of the best placements for these wells, what effect does their testimony have on your opinion for their placement?

A. I'm talking specifically about hydrogeologic phenomena when I'm -- that is the purview of my testimony.

Q. As am I.

A. So, I would encourage -- as already has happened. There has been some requests made of some of the landowners to share information. And I expect those requests will continue as this process moves forward.

Q. Well, if a landowner is intimately familiar with the flows and drainage of their properties and says that is a terrible place for a well, doesn't that hold -- carry some weight in terms of your recommendation of the feasibility of

putting a well there?

A. Well, I would want to know why they consider that a terrible location for a well. If it's a view shed issue, if it's an ingress/egress issue, if it's a storm water issue, if it's a cultural issue, and based upon what those specific issues are, I think there might be different weights attached to that information and supply.

Q. Mr. Maggiore, we're here for specific applications and the specific testimony of the landowners has been that these are terrible places for a well because they're right in the middle of drainages next to creeks, next to springs, and next to seasonal runoff.

MR. HALL: Mr. Examiner, again, in accordance with your earlier rulings, I'm going pose a relevance objection because the testimony of the landowners is not relevant to the decision you have to make here today.

MR. BROOKS: Well, I think there is some. Mr. Maggiore's testimony injected some relevance to it, but I believe this is argumentative. But you have one more minute, so you can ask another question if you want to.

Q. (By Mr. A. Trujillo): Answer that question.

A. I apologize. Can you repeat the question?

Q. We have testimony from landowners.

A. Yes.

Q. That specific testimony has been that that is not

a good place for specific wells. There are multiple specific wells because they are right in the mouth of drainages. They are very close acequias, they are very close to springs, they are very close to natural drainages, and in the mouth of a box canyon. Shouldn't that carry some weight with your recommendations to place those wells there?

A. Well, certainly I would want to know all that information. But I stand by my previous testimony, that based on the information I have today, I believe that these -- all these locations can be drilled in a manner that's protective of public health and the environment.

Q. So that means you've disregarded, then, the testimony of these landowners in this hearing to say that these are the reasons why --

MR. HALL: Now we are getting argumentative.

MR. BROOKS: I agree. And I believe your time is up, Mr. Trujillo, so I'll sustain the objection to the last question.

Thank you, Mr. Maggiore.

At this time, I'd like to call Mr. Reed for a few questions.

FURTHER EXAMINATION OF MR. REED

BY MR. BROOKS:

Q. Mr. Reed, I'm looking at your schematics, your well bore schematics, Pages 8 and 10 of Exhibit 1.

A. Okay.

Q. Okay. You're going to cement surface casings at 350 feet and then you're going to install production casing at approximately 2000 feet?

A. Yes, sir.

Q. Now, this symbol with the X, how are you going to install the production casing? Are you going to cement the production casing?

A. Yes. We propose to cement about 2000 foot of cement up.

Q. Yeah.

A. If we encounter other water flows -- or there may be some reason to cement it and put it back to surface.

Q. Okay. Now, I don't see it on your schematic, and I don't recall if it was in your testimony, I missed it, but are you going to install tubing?

A. Yes, sir. And that's what this symbol is, it's tubing. This is the production casing, this outside line. And this is tubing with a packer.

Q. Okay. I thought that symbol of X is a packer, so that's what was getting me confused. And do you know what diameter of tubing you are going to be using?

A. It'll be 2 3/8 tubing.

Q. Okay. But while you're drilling from 350 down to 2000, then if there's a fresh water formation at 800 feet as

indicated in the case of the Claude Hinkle Well, that would be open to the well bore at that point. That space would be open to the well bore, would it not?

A. Right. And if we set --

Q. Until you set the production string casings.

A. Well, if it was a pretty significant water flow. That's why we left the option to set the 7 inch.

Q. Yes.

A. And we were fully prepared to set the 7 inch -- even on these 2000 foot wells -- if we hit a significant water flow.

Q. Well, this is my concern here. That if you've got a water formation at 800 feet and your backup plan is to use brine mud if your air is not working, I was wondering how you're going to protect that fresh water formation from exposure to your brine mud if you have to use it.

A. Well, we -- in the instance of the Hinkle Well and a lot of that, it would be better to set the surface casing down at 900 foot or so to fully protect that water.

Q. Okay. I agree with that statement. Okay. Now, I don't know a lot about fracing. I know very little about it. In what configuration of the well do you frac? That would be after you set your production string casing, wouldn't it?

A. Yes.

Q. But it would be before you set your tubing?

A. Correct.

Q. That's what I thought. So your frac fluid when it flows back is going to flow back inside the production string casing?

A. Right.

Q. Okay.

A. For a while, as long as the well flows, and then we'll -- if it's flowing pretty good, a lot of times we'll go ahead and lubricate a packer in the hole and set it and then have it sealed off on the pump-out plug in it. And then you run tubing into the packer and pump the pump-out plug out. And then you've got your flow coming up the tubing and not the casing.

Q. Okay. I really believe that's all my questions. Counselors, Mr. Hall, Mr. Trujillo?

MR. HALL: I have no questions.

MR. A. TRUJILLO: No.

MR. BROOKS: Very good. Thank you. You may stand down.

Does that complete your presentation, Mr. Hall?

MR. HALL: We have one other item of business. You had asked for the presentation of the oil and gas lease because there was some testimony.

MR. BROOKS: I'm sorry?

MR. HALL: You had requested that the oil and gas

lease be made available.

MR. BROOKS: I did, yes.

MR. HALL: I would be glad to tender that into evidence, if you like.

MR. BROOKS: Okay.

MR. HALL: It's filed as record in the Rio Arriba County Clerk's Office, at 530, Page 25, 24. We have the lease and the assignment to Approach Oil.

MR. BROOKS: Is all this acreage under one lease?

MR. HALL: Yes, sir.

MR. BROOKS: Okay. And I believe, correct me if I'm wrong --

MR. HALL: We're up to Exhibit 24, so I'll mark it --

MR. BROOKS: Correct me if I'm wrong, but I believe a recorded document doesn't have to be authenticated.

MR. HALL: Rule 1005.

MR. BROOKS: I used to remember all those things, but I've forgotten. You may tender that into evidence.

MR. A. TRUJILLO: I'd like to object until I actually get a chance to see if it's --

MR. BROOKS: You have a chance to look at it.

MR. A. TRUJILLO: -- complete to my knowledge.

MR. HALL: We'll make sure we get you a complete copy. There is a missing page, but we'll tender this one for now, Mr. Examiner. And we'll get you a full copy.

MR. BROOKS: Okay.

MR. HALL: If there's no objection to it.

MR. A. TRUJILLO: For the record, Page 5 of the Addendum A, which contains the forced mature clause is missing.

MR. BROOKS: So you're going to supplement the record with a complete copy and furnish a copy thereof to Mr. Trujillo?

MR. A. TRUJILLO: I have a copy.

MR. HALL: Let me mark that for you.

MR. BROOKS: Okay.

MR. HALL: You want me to deliver that you to?

MR. BROOKS: If you get it to me by Thursday, then I can get it to the court reporter when she comes in for the regular Division hearing.

MR. HALL: Okay. I'll be here.

MR. BROOKS: One other thing I'd like to request: Well, first of all, do counsel want to present argument? It's a little late in the afternoon for it.

MR. HALL: Just to say the most dreaded words to any Hearing Examiner, and that is we request an expedited order, Mr. Brooks.

MR. A. TRUJILLO: And the County opposes an expedited order.

MR. BROOKS: Okay. Mr. Hall, I would like to request that Approach supplement the record on one matter, because I'm

really concerned about these deep wells, particularly, of course, the Cloyd Hinkle because of the indicated proximity to one of the locations. But also, there were several deep wells that were shown on one of the exhibits that the County introduced. And I forget where it was in the County's materials, but there were two or three or four deep wells. I forget exactly how many. I believe it was in Mr. Finch's presentation.

MR. HALL: I think if you look at our Exhibit 14, it has the water well on the TA Creek.

MR. BROOKS: Yeah. The one I was looking at was 14, and the one that was shown on there is the -- the deep wells are the Cloyd Hinkle, and then the Leroy Martinez is fairly deep and the Sultemeier is up toward that depth.

But there were some others shown in one of Mr. Finch's presentations. And I don't know if it was in the technical or --

MR. FINCH: The PowerPoint?

MR. A. TRUJILLO: Mr. Hearing Examiner, that exhibit is a slide of Mr. Finch's PowerPoint which you have a copy of on the CD directly in front of you.

MR. BROOKS: Okay. Could you furnish a copy of that exhibit to Mr. Hall? And I'm going to request that Approach ascertain the locations of those deep wells and --

MR. HALL: You want vertical distance?

MR. BROOKS: Yes. Where they're located in relation to any of the proposed locations. And also if you could -- and I'm not asking you to do too involved a search -- but if you can ascertain if they are active water wells, I would like for you to report to me whether they are or aren't. Or if you can't ascertain that, report also that fact.

I would like to make that part of the record. And Approach being the applicant for the permit, I think it's reasonable to put the burden of obtaining that information on Approach.

MR. HALL: Do you need actual survey?

MR. BROOKS: No. I just need you to -- I mean, you're going to have to -- given the way things are up there in Tierra Amarilla, my supposition is you're probably going to have to find out where they actually are and then plat them by lat/long. That's probably the only way you're going to be able to find that information.

MR. HALL: GPS lat/longs?

MR. BROOKS: I'm just asking for best effort. I'm not asking for any kind of rigorous proof here.

MR. A. TRUJILLO: Mr. Hearing Examiner, if I understand you correctly, you're asking Mr. Hall to supplement the record with maps?

MR. BROOKS: With locations and a plotted distance. It doesn't have to be an on-the-ground survey. It can be

plotted by GPS to where the -- the distance to where these wells are from the proposed locations. And, of course, furnishing a copy to Mr. Trujillo. But that goes without saying. But I guess it ought to be said anyway.

MR. A. TRUJILLO: Along those lines, Mr. Hearing Examiner, in terms of going without saying, let me state that at the close of the hearing on Friday I was approached and informed that a conversation was overheard by a member of the public between Mr. Hall and yourself where Mr. Hall informed you that he had tried to send you or sent you an e-mail.

Without casting any allegations, such an e-mail was not received by our office and may constitute an ex parte communication under the rules and regulations of the OCD. We would like Mr. Hall to provide any copies of any e-mails that he sent to you and vice versa, so that we can at least ascertain if any sort of ex parte communication has taken place.

MR. BROOKS: I will be happy to furnish those to you, Mr. Trujillo. The e-mails that I exchanged with Mr. Hall had to do with whether or not this was a standard location, which I think is really only a matter of concern for correlative rights. And the hearing didn't involve any correlative rights.

But I certainly will be happy to furnish them. They are matters of public record. And I will furnish you -- I assume you do have copies of Mr. Hall's administrative

Nonstandard Location Applications that were filed for the Sultemeier and Sena No. 1 wells?

MR. A. TRUJILLO: I do not.

MR. BROOKS: Okay. I will furnish those to you also.

MR. A. TRUJILLO: I do object for the record, then, that I believe that in that case -- if those e-mails dealt with anything about the subject matter, the statutory subject matter, of this hearing, then ex parte communication has taken place.

MR. HALL: Let me establish for the record, Mr. Examiner. We discussed this first order of business when this hearing opened on Friday.

MR. BROOKS: We did.

MR. HALL: This is on the NSL applications we had pending and had been advised that they could be withdrawn.

MR. BROOKS: And I continue to believe that the NSL applications are wholly irrelevant to the subject matter of this proceeding since the question of standard location or not only effects correlative rights and there aren't any correlative rights issues. But that aside, I will certainly furnish all this material to Mr. Trujillo.

MR. A. TRUJILLO: And I believe for the record that Mr. Hall could accomplish the same goals by contacting anyone at OCD legal without contacting the Hearing Examiner regarding well applications in a pending hearing.

MR. BROOKS: Well, it actually -- I'm not going to argue the point any further. I will provide you with copies of all the materials that were exchanged with regard to the NSL applications.

And no action has been taken on the NSL applications because it appeared that from -- based on what Mr. Hall -- well, I understood you to withdraw them based on what you represented.

MR. HALL: That's correct. And for the record here today, counsel should know the NSL applications are always directed to the Division Director, Mr. Fesmire.

MR. BROOKS: They are. And I'm the person who handles them. But I have coded those as being withdrawn.

Okay.

MR. HALL: I'll be glad to copy anything that you provide to counsel as well.

MR. A. TRUJILLO: Along those lines, a Public Records Request, pursuant to the Inspection of Public Records Act, has been filed regarding any e-mail sent from Mr. Hall to the Hearing Examiner for the period of time -- I believe it is May 1st through today.

MR. BROOKS: Okay. Copies of those will be -- unfortunately, I don't know how to -- when they did the last upgrade, they eliminated the way I used to attached e-mails to e-mails, so I don't know how to do it anymore. I will mail

those to you tomorrow and I will fax them if you want to give me fax numbers.

MR. A. TRUJILLO: Mr. Hearing Examiner, 753-4750.

MR. BROOKS: 753-4750. I assume that's area code 505 from here?

MR. A. TRUJILLO: 505.

MR. BROOKS: Okay. Anything else before I call for public comment?

MR. HALL: If my technical witnesses may be excused. That's all we have, Mr. Examiner.

PUBLIC COMMENTS

MR. BROOKS: Okay. If there is anyone here who wishes to make a comment before we close the proceedings?

It looks like we don't have an unbearable number of people, so I will allow three minutes each for the people who are present. You may proceed.

Well, I think I can -- yeah. I think it will be fairly flexible. Please don't go on to great length. I'll hold the stop watch on them.

State your name for the record and spell it.

MR. MICOU: My name is Johnny Micou, it's spelled M-i-c-o-u. And I'm actually going to read for someone else, and his name is Robert Coward, C-o-w-a-r-d.

The statement, again, is: "My name is Robert Coward. I represent myself as a concerned citizen of New Mexico. I

have a Ph.D. in geology from Rice University. I have worked in the oil and gas business for almost 30 years. I have worked for major oil companies, for independents and for myself. I have drilled wells in the same rocks in which Approach would like to drill.

"I have looked at hundreds of wells in Rio Arriba County, particularly in the Jicarilla Apache Reservation. For the past seven years, I've been involved with water resource projects. Until recently, I was employed by John Shomaker and Associates, Inc. Steve Finch works for them.

"I want to make statements on two topics raised in this hearing.

"1. The OCD needs to prohibit extraction of oil and gas from formations that contain potential water supply that could be put to beneficial use for the people of New Mexico. The OCD has the authority to protect groundwater with a background concentration of 10,000 milligrams per liter or less that can be put to beneficial use and to protect the flowing of springs, 19.15.1.19, Prevention and Abatement of Pollution; 19.15.3.106, Sealing off the Strata.

"1A. There is fresh water with excellent water quality much less than 10,000 milligrams per liter in the same formations that Approach intends to test for oil and gas. There is clear, unambiguous data from a drill stem test and completion reports in T228NR4E and from the regional water

planning mentioned by Steve Finch.

"The formation water differs greatly from that in the Puerto Chiquito Fields. That water is saline and it is 10 times much more saline than the TA area.

"1B. This fresh water is connected to recharge areas and may be connected to springs in the area and is part of the regional planning system that supplies water to people living in the Chama Basin.

"1C. The deep Sultemeier test is located in an area where faults have been mapped. These faults and associated fracturing would enhance connectivity between aquifers at difference depths.

"1D. Any completion techniques, i.e., fracing, acidizing into fresh water-bearing zones may contaminate these zones.

"1E. If Approach were to find oil and gas in zones that have potential for beneficial uses, such as aquifers, long term drilling in these intervals may draw down these water resources.

"2. The people living and working in this part of the Rio Arriba County need to raise a big stink about the so-called dominance of mineral rights over the rights of surface owners. The laws about this in this state need to be changed. The time is right to give the surface owner control over his own property on an equal basis as the owner of

minerals. A few thousand dollars will not compensate landowners, such as the Sultemeier family for the loss of property values.

"The oil companies could be more generous, but they won't. They could offer royalty payments or a percentage of the profits at least equal to the loss in the value of the property, but they won't. There is an increasing number of communities that are faced with the same problems. People need to join together to change the laws."

I'm finished with the statement.

MR. BROOKS: Thank you. Next? Again, please state your name for the record and spell it for the benefit of the reporter.

MS. VARELA: My name is Janice Varela with a V, and I am from the New Mexico Acequia Association. I'm a community organizer.

MR. BROOKS: Now would you spell your full last name. I realize in Spanish -- it's very easy to spell Spanish names if you're familiar with Spanish, but not everyone is.

MS. VARELA: Sure. V as in Victor, a-r-e-l-a. First name is Janice. And I am here to present comments on behalf of Paula Garcia. She is the Executive Director of the New Mexico Acequia Association, and she had to leave. She was here earlier. She had to take a flight. And I'm going to read a letter. It's short. And it's addressed to Mr. Fesmire.

"Dear Mr. Fesmire: I'm writing on the behalf of the New Mexico Acequia Association to express concern about permits recently granted by the Oil Conservation Division in Rio Arriba County. The New Mexico Acequia Association is a statewide advocacy organization for acequias whose mission is to protect water for agricultural and community uses. We seek to protect water rights and water quality, revitalize the agricultural economy, and strengthen our farming and ranching traditions.

"Acequias are a centuries-old legacy in New Mexico that continue to provide water for thousands of families who continue generational farming and ranching traditions. They are vital to the state's cultural heritage as well as the agricultural economy that supports all or part of the income of many families throughout the state. The State of New Mexico in recent years has recognized their importance by passing legislation strengthening their authority over local management of water rights and by passing a memorial recognizing them as cultural patrimony of the State of New Mexico and requesting various agencies to work with acequias on matters of state policy.

"We were dismayed to discover that the OCD granted permits without full consideration for the impacts to water quality. In particular, we are gravely concerned at the permits for drilling on the property that could impact acequias (Sena No. 1 and Sena No. 2). It appears as if the OCD granted

the permits without adequate consideration for the potential impacts on the watershed and on the water rights that are part of the historic acequias of the area. Both drilling sites pose potential threats to water quality, particularly the proposed site that is less than 100 yards from a community acequia.

"The OCD is charged with protecting the state's safety and welfare. We urge you to reconsider this approval and review the proposed applications more carefully. Both Approach Energy and the OCD should demonstrate greater attention to the concerns of local landowners and communities who will be impacted by drilling. We fully support the actions of Rio Arriba County to challenge these permits. For more information about our organization and our position, please call 505-995-9644."

Thank you so much. And I would like to submit this for the record.

MR. BROOKS: Thank you. Okay. Give it to the reporter.

MR. GLEADLE: My name is Brian Gleadle. I'm the chief of operations for the Game and Fish Department.

MR. BROOKS: Okay. Could you spell your name, please.

MR. GLEADLE: The spelling of my last name if G-l-e-a-d-l-e.

MR. BROOKS: Thank you. Proceed.

MR. GLEADLE: Typically the Game and Fish Department is consulted with federal land management agencies regarding any oil and gas drilling. Given the fact these applications are made on private property, some of that typically slips through the cracks and the department isn't consulted to a level that would give us the ability to coordinate the activities for any type of drilling activities.

I think, given these applications, the overreaching concern that the department currently has is just the lack of information regarding the placement of these well locations; specifically, critical habitats for deer, migration routes for elk and also the cold water fisheries and habitats throughout the upper reaches of the TA Creek.

While it concerns regarding oil and gas development, the hazards are typically noted through conversations and through most of the technical discussions. I think that the defendant shares the concerns that the drilling in such a close proximity to any of these perennial streams, even with best management practices, are of concern when those best management practices cannot guarantee that given a spillage or a -- any type of accident, that those water qualities can be controlled even with the -- specifically for wildlife, or even public consumption.

The department would offer our support to the OCD to evaluate these sites specifically for onsite concerns or

issues. Typically in these areas we might even have issues regarding the meadow jumping mouse which is currently being under evaluation for listing. And this area could, in fact, support those type of species. But without those types of onsite investigations, that type of information may be lost forever.

Through the testimony given today, it sounds like most of the ecological and hydrological onsite investigations were actually conducted after the application process was made. So I think a lot of that information might be backtracked, but it's important that that work be done.

Thank you.

MR. BROOKS: Thank you. Next? Again, please state your name for the record.

MR. ATKINS: My name is Arnold Atkins, A-t-k-i-n-s. I'm here representing the Truchas Chapter of Trout Unlimited. Trout Unlimited is a national conservation organization with thousands of members. In New Mexico there are nearly 1,000 members and about 500 of them are with the Truchas Chapter, which is headquartered here in Santa Fe, which I represent.

I became a New Mexico residence in 1946, and I'm familiar with Northern New Mexico topography, history and traditions. I'm not personally familiar with the Rito de Tierra Amarilla, TA Creek, but I'm familiar with the terrain. Since it is private property, I've never actually been there.

Neither I nor Trout Unlimited has a position or objection to responsible development. We are, however, concerned with what sounds like voluntary compliance with best management practices without monitoring. And by that I mean that TU would generally oppose any project which did not place high priority, even guarantees, on protecting the watershed, the riparian habitat, and the aquifer.

I would, therefore, be opposed to such a project which didn't guarantee absolute protection of these entities and have some sort of punitive consequence for failure to protect these resources and a punitive consequence for failure to mediate any failures of protection.

On face value, drilling in a marsh or wetland seems extremely hazardous, even risky. How can one build berms and ditches in a marsh? How can building a well pad in a wetland not affect the watershed. It may be possible. But guarantees should be mandatory. We don't need another Superfund site or even a baby fund site.

Finally, Rito de Tierra Amarilla is said to contain Rio Grande Cutthroat Trout, our state fish, and a subspecies which was recently declared a candidate species for protection under the Endangered Species Act. I'm not familiar with this stream or the fish that reside in this stream, but we would be particularly wary of operations which might potentially damage the habitat of our state fish and note that any such damage

could soon become a violation of the Endangered Species Act further increasing our recommendation for stringent mandatory guarantees before any project approval.

MR. BROOKS: Thank you, Mr. Atkins. Anyone else? Would you please come forward? State your name for the record.

MR. McREYNOLDS: My name is Greg McReynolds. I work for Trout Unlimited, the national organization. We represent about 150,000 sportsmen across the United States, about 400 chapters. I'd like to make three quick points.

One, Rito de Tierra Amarilla is listed as a host for a population of Rio Grande Cutthroat Trout. As Arnold mentioned, in light of the pending listing under the federal ESA, this population of native trout is extremely valuable to the State of New Mexico. And, frankly, here in New Mexico, any population of Rio Grande Cutthroat Trout is going to be essential to the long term persistence of the species.

Second point: Outdoor recreation here in New Mexico contributes more than 2 billion to the economy. Clean water and intact habitat are essential to this substantial portion of our economy. The fact that there are more than 11,000 wells already in Rio Arriba County, I think that attests to the fact that we're not protesting every single bit of energy development out there.

This is a pretty important place, and the simple fact that there's so many people here fighting for this one specific

area is probably a good indication that we shouldn't be up there drilling.

Last point: In an April 6th news story in the Ft. Worth Star Telegram, Approach Resources CEO J. Ross Craft is quoted as saying, "If we drill eight wells and don't do well, we still haven't lost a lot of money."

What that says to me is for Approach, this is a low-risk undertaking. For New Mexicans and residents of Rio Arriba County, this is a big gamble. They're not going to win anything out of this and they have a lot to lose. This is one of those places that needs to be protected and not drilled.

Thank you.

MR. BROOKS: Thank you, Mr. McReynolds. You sir?

UNIDENTIFIED PUBLIC MEMBER: My name is Oscar (inaudible). I represent the New Mexico Wildlife Federation of which we have 7,000 supporters and members. And I also am connected with the National Wildlife Federation, which has approximately 1 million members in the United States.

I have been dealing with oil and gas issues for quite a number of years, anywhere from a Congressional level all the way down to the state and county level. And my past experience -- or brief experience -- regulating the oil and gas industry when I worked for the Oil Conservation Division dealing with contamination and cleanup. So I have some experience.

As a sportsman, this is a critical habitat, critical to fisheries, especially since 3 percent of the habitat for the Rio Grande Cutthroat -- we're down to 3 percent of the habitat that the Rio Grande Cutthroat used to have -- this is a critical component for their fisheries. And especially since it's designated as a cold water fishery, every precaution should be taken.

And in this case, I agree with Rio Arriba County's petition. This should not be developed because of the aquifer, and the potential for contamination, and the resources there. There are a number of aquifers identified above and below the production zones that we know little of. And they said they can be communicated or have contamination potential, especially when you deal with fracing fluids. And the petroleum engineer said that he couldn't guarantee it.

Now, if you look at the cost to the nation, fracing has contaminated and got out of zone and contaminated fresh water aquifers and polluted private wells. In the case of up in Rifle, Colorado, the hydrocarbons got out of zone and they -- the gas, you could light the nearby creek with a lighter.

So there's a lot of potential there, and what I think you need to do if you're going to proceed with this, you need to make sure these voluntary best management practices are actually a stipulation of the Oil Conservation Division instead

of relying on a voluntary commitment with no teeth -- especially on private land.

So you need to have -- the other thing I would recommend is the American Water Works Association requires drilling of water wells and those drilling fluids have to be toxic free. You're penetrating a lot of aquifers. You have some testimony that you might have lost fluids and circulation that may allow contamination using the type of drilling fluids, and you may allow those fluids to get into the aquifer and contaminate a large zone.

You have no monitor well network to insure that your drilling activities or fracing fluids will not contaminate or affect those drinking water zones above or below. So that should be a requirement. And also you should go in each one of these water wells and do background testing to make sure of all the water quality parameters and not just the TDS. You need to look for all the organics and do a complete sweep of testing to make sure that they match the Safe Drinking Water Act requirements.

Now, under the Energy Bill 2005, under the Safe Drinking Water Act which established the drinking water standards for public water systems, Congress in 2005 exempted fracing fluids. So if a company comes in and uses fracing fluids and it contaminates the aquifer, they're not responsible for cleanup or making sure that they get cleaned up.

As common practice, fracing fluids are considered proprietary and not being open and, I guess, listed in what they are using. That should be a requirement of OCD. Not only the OCD should know those fluids, but also the general public should know about all fluids that are being used in the drilling phase.

One of the other requirements -- and everyone talks about the drilling Pit Rule. That is fine for drilling. But if you go into the production rules, the OCD has no requirements for secondary containment for the tank batteries. If you look at your spill reports, hundreds of spills occur at those tank batteries. You are either going and getting those fluids out of them or oil and gas or condensate or produced water allows spills and leaks to occur at those sites. There's no secondary requirements.

A few places where you have vulnerability to shallow groundwater, a few industry practices are going and putting in secondary containment underneath the tank batteries and having secondary containment. That should be a requirement. Because if you put one in there -- and the spill reports indicate it -- if you have a spill, especially in the wintertime, you have freezing and busting valves or accidental opening of valves. That way you can mitigate and you have it onsite.

Right now on these drill pads, if you have a spill or leak or an overflow valve is not required, all these things

overflow, and you got spills and leaks all over the place right in a very vulnerable watershed.

So those are some of the common approach tactics that should be required and stipulated if you proceed. But in my opinion, this is too special a place. You have too high vulnerability to contamination and you have inadequate site evaluation to determine what's there.

Thank you for your time.

MR. BROOKS: Thank you. Anyone else? Yes, ma'am.

MS. SULTEMEIER: I just want to -- I'm Beth Sultemeier. I'm representing the Sultemeier family. And I'm going to go a little bit backwards. I just want to mention on Sultemeier Well No. 2, that well has not been approved yet. And we have not agreed to the site or things, especially with looking at the proposed road through the elk pasture.

Sultemeier No. 1, you know, I've stated very clearly that we did not approve that site, not only because of sentimental reasons because it was my dad's favorite spot, but over the weekend we were talking about that was also one of the places that our family has dreamed of having a cabin -- as well as another location. There are several locations we like adjacent to No. 2.

But after hearing all the testimony over the last couple of days, we've just become more concerned even with putting it in the box canyon meadow with the runoff and things

like that. And then, also, the proximity to two wells, very close, which I marked in my testimony, and things like that.

And also, we had discussed that because the well has not been drilled on Sultemeier No. 1, it is the only place so far that they had already put in a lined tank and a pad. Now they're stating that they're going to use a closed-loop system. Also, following the Gold Book standard, that would all have to be removed now, because the pad is full of river rock and things. It wouldn't meet that standard, apparently. And then they lined tank.

We would like that permit to be gone away and removed and started again. And this would probably be the best time to do that since the well has not been drilled. We would like to have that permit withdrawn and go with another -- work on something else.

That's it.

MR. BROOKS: Okay. Thank you. Mr. Hall, on that subject, I didn't really quite understand. Are you going to use that location for the Sultemeier -- is Approach going to use that location for the Sultemeier No. 1? Or are they going to move that? I sort of got the idea they were going to move that.

MR. HALL: The pit in the liner will be removed.

MR. BROOKS: Okay. You're going to use the location? You're just not going to use the pit?

MR. HALL: Right.

MR. BROOKS: Okay. And do you or do you -- not that it's relevant as far as OCD is concerned, but you do not have a surface use agreement with the Sultemeiers at this point; is that correct?

MR. HALL: You know, I'm not altogether sure. I may -- you want me to find out?

MR. BROOKS: No. That's not necessary because you have the options that you have under the Surface Owners Protection Act, and I am sure you will comply with one or the other of them, and if not, you'll be subject to the penalties that that Act provides.

Anybody else before we adjourn?

MR. SCHREIBER: I'd like to make a comment.

MR. BROOKS: Oh, I'm sorry. Sure.

MR. SCHREIBER: I always count on Oscar to cover what I need to talk about, but he missed it.

My name is Don Schreiber, S-c-h-r-e-i-b-e-r. Mr. Hearing Examiner, thank you for providing this opportunity to speak. I represent the Devil Springs Ranch in Rio Arriba County. It's a constituency of two, my wife and I.

We get the feeling, listening to the closed-loop system that has been explained to us here extensively over the last couple of days, that it's some kind of a magic bullet or a silver bullet solution to the problems, and would solve the

watershed concerns that the landowners have expressed and certainly the expert witnesses have maintained.

But it is not magic. The closed-loop systems are subject to all the same accidents that Approach has already had in Texas; holes in the bottom of the tank, roustabout crews not picking up, not hooking up the hose; cows opening the valves; God striking your location, fires. We have all those same accidents waiting to happen with a closed-loop system. But now if a closed-loop system is used, we have the additional liability facing us that we're all too familiar with, not a hypothetical, it's something that we all know, unfortunately, and that's the simple traffic accident.

This closed-loop system's virtue is also its Achilles Heel. And now that fluid, those cuttings, all of that will have to be trucked away -- and as Mr. Reed, I believe, testified -- to a disposal facility, an approved one by the state. They have one picked out. And they specified it as a basin disposal facility.

So when that drilling fluid, cuttings, and all the rest of the waste of that drilling location gets up and gets mobile, it's not just Mr. Woolley's problem or his site, or Mr. Sena's problem or Ms. Sultemeier's problem or Mr. Garcia's problem or Ms. Roller -- it's everybody that's on the highway. It's the creek, it's the watershed.

It's all of our problem now, because those things

that you and I know about -- traffic accidents -- describe not an exotic oil field accident or some transmutation between underground aquifers and fractures and CO2 pressuring up in a vertical wing and blowing the top out of the Mancos Shale or lighting our water faucet on fire -- none of those sort of science fiction things that we might imagine.

We're subject, all of us, including Mr. Hall, to a T-bone, to a head-on collision, to a rear-end, and especially to a rollover. That's a very dangerous highway. My wife and I live on the other end of that highway. There's oil field wreck after oil field wreck after oil field wreck. Commonly, they will haul that out of there at 3200 gallons at a time in a vacuum truck far away to the basin disposal facility.

So no longer is it the problem of people that live, like Mr. Holloway does, on Highway 64 there and the traffic that might be going up between TA and Tres Piedra, now it's the problem of the people all along the route. Now it goes through TA. Now the truck goes to Chama. Now it goes to Lumberton, to Dulce, what's remaining of our town Govenador, into Blanco, New Mexico, over the San Juan River, then to Bloomfield where they turn right and head up five miles for a journey of 120 miles to the basin disposal pit. Then that truck turns around and comes back.

So, once again, instead of getting to be a rancher, I find myself trying to defend ourselves and our way of life and,

in fact, our family. Because my wife has been run off the road three times from off-road traffic of oil and gas well trucks exactly similar to this one. Those are reported.

And if the OCD doesn't look at the production, the 30 years that happens after the closed-loop system goes away, and if the creek and the watershed and the rest of us survive trucking all that closed-loop waste out of there, OCD must recognize that the production for the next 30 years is an exposure every day just to the types of losses Mr. Reed and his company have had.

I don't think that it's beneficial whatsoever to condemn Approach. If you look at the RCC records for the months in which those losses that Approach had theirs -- and I'm sure they didn't want them, and I'm sure they did everything they could not to have them. I have no doubt of that. But there are 112 losses in those three months -- in those two months -- three months -- among your fellow oil field workers, operators, contractors -- in Texas. Good companies, Conoco, Devon.

I find your industry fascinating. I think it's complicated. I don't think it's rocket science. Let me know, Mr. Hall. But in rocket science, I believe our country puts the absolute best that the country has to put forward into every rocket in space. And when we launch those people, our astronauts, off this planet, it's with every single possible

accident prevention and thoughtfulness that we could possibly hope and wish for and bring this country's wonderful resources to bear on. But do we have accidents in space? Tragically, we do.

Let's not let that happen here. Thank you for your time.

MR. BROOKS: Thank you. Anyone else? Very good. We stand adjourned.

[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 23rd day of June, 2008.

Joyce Calvert

JOYCE D. CALVERT
New Mexico P-03
License Expires: 7/31/08



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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 1-234 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, 23rd day of June, 2008.

Joyce D. Calvert
Provisional License #P-03
License Expires: 7/31/08

Paul Baca, RPR
Certified Court Reporter #112
License Expires: 12/31/08



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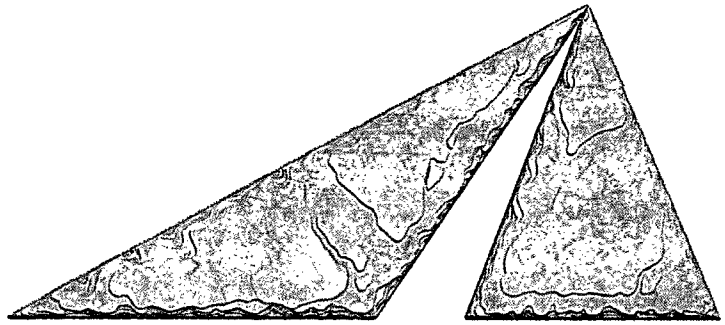
# NMOCD Case Nos. 14134 and 14141
# Approach Operating LLC
# June 20, 2008

## Exhibit Index

| EXHIBIT | DOCUMENT |
|---|---|
| 1. | Approach Power Point Slides: Operations/Interests |
| 2. | New Mexico and Colorado Structural Features (Poster) |
| 3. | Structural Features Within the Tierra Amarilla Land Grant (Poster) |
| 4. | El Vado East Cross Section (81/2 X 11) |
| 5. | El Vado East Regional Production |
| 6. | Geologic Maps |
| 7. | Tierra Amarilla Land Grant Lease Map |
| 8. | Well Files (A-I) (APD's with attachments) |
| 9. | Operations Plan Sena No. 1 |
| 10. | Operations Plan Sultmeier No. 1 |
| 11. | Gold Book Excerpts |
| 12. | Maggiore C.V. |
| 13. | Excel C.101 Data |
| 14. | Excel Waters Database |
| 15. | Water Data Map |
| 16. | Soils Map NRCS |
| 17. | Soils Map NRCS |



**Approach**
Resources Inc.

## New Mexico Oil Conservation Division

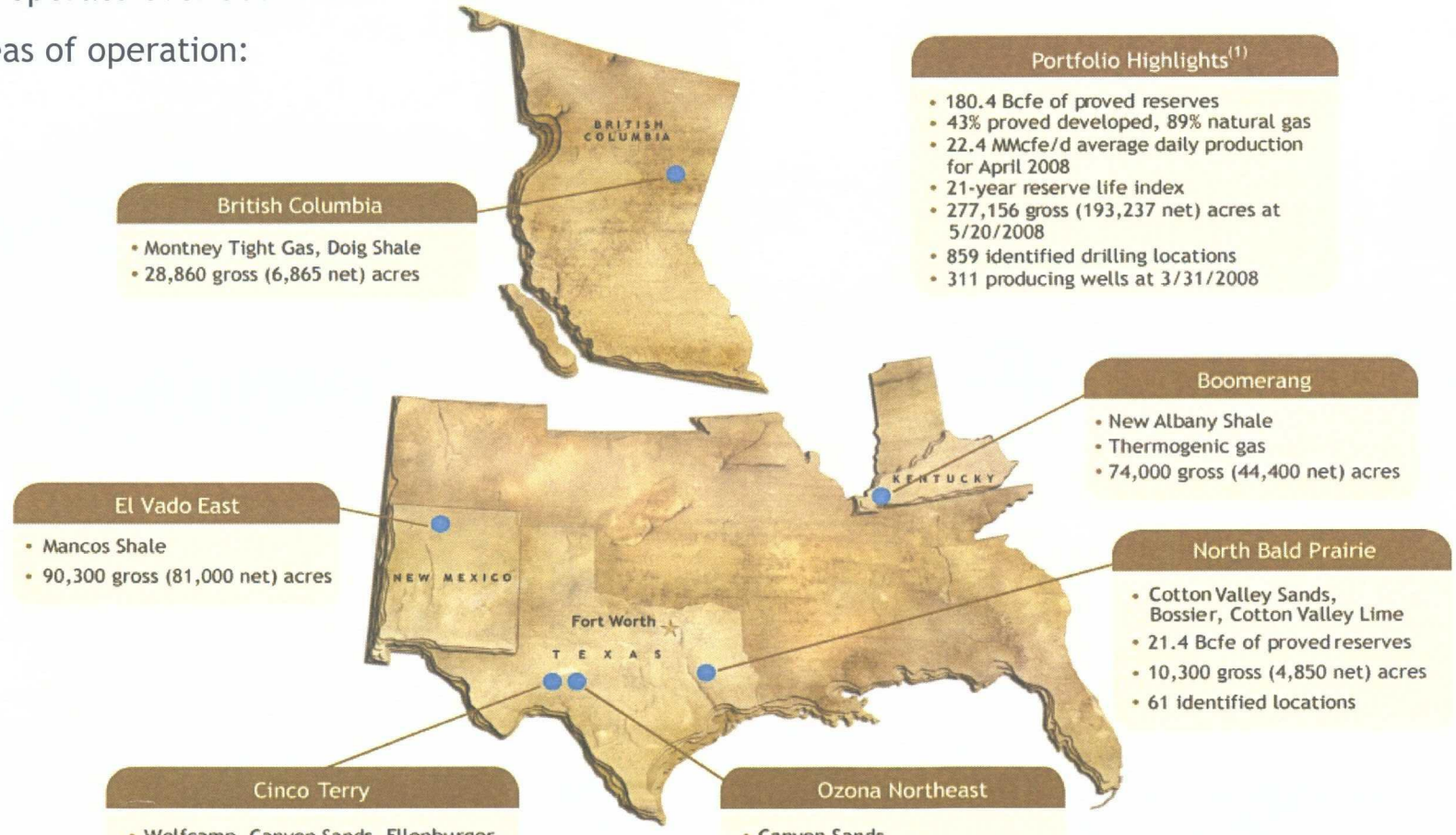
Santa Fe, New Mexico
June 20, 2008



NMOCD Case Nos. 14134 and 14141
June 20, 2008
Approach Operating LLC
Ex. No. 1

# Management and company history

- Approach Resources Inc. was founded in 2002
- Approach management/technical team has an average of 28 years of industry experience
- We operate over 300 wells
- Areas of operation:




**Portfolio Highlights[1]**

- 180.4 Bcfe of proved reserves
- 43% proved developed, 89% natural gas
- 22.4 MMcfe/d average daily production for April 2008
- 21-year reserve life index
- 277,156 gross (193,237 net) acres at 5/20/2008
- 859 identified drilling locations
- 311 producing wells at 3/31/2008

**British Columbia**

- Montney Tight Gas, Doig Shale
- 28,860 gross (6,865 net) acres

**Boomerang**

- New Albany Shale
- Thermogenic gas
- 74,000 gross (44,400 net) acres

**El Vado East**

- Mancos Shale
- 90,300 gross (81,000 net) acres

**North Bald Prairie**

- Cotton Valley Sands, Bossier, Cotton Valley Lime
- 21.4 Bcfe of proved reserves
- 10,300 gross (4,850 net) acres
- 61 identified locations

**Cinco Terry**

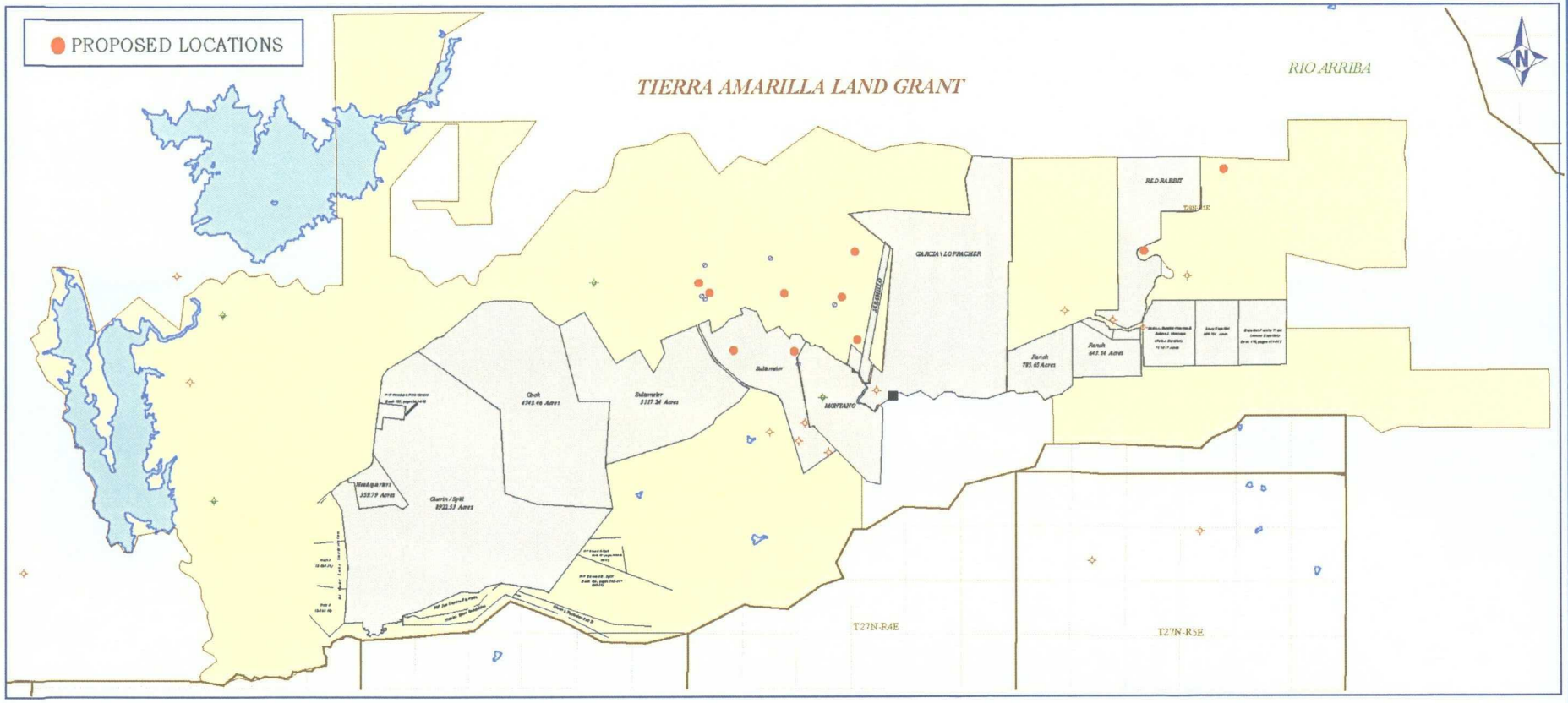
- Wolfcamp, Canyon Sands, Ellenburger
- 18.3 Bcfe of proved reserves
- 31,380 gross (14,406 net) acres
- 119 identified locations

**Ozona Northeast**

- Canyon Sands
- 140.7 Bcfe of proved reserves
- 42,316 gross (41,716 net) acres
- 679 identified locations

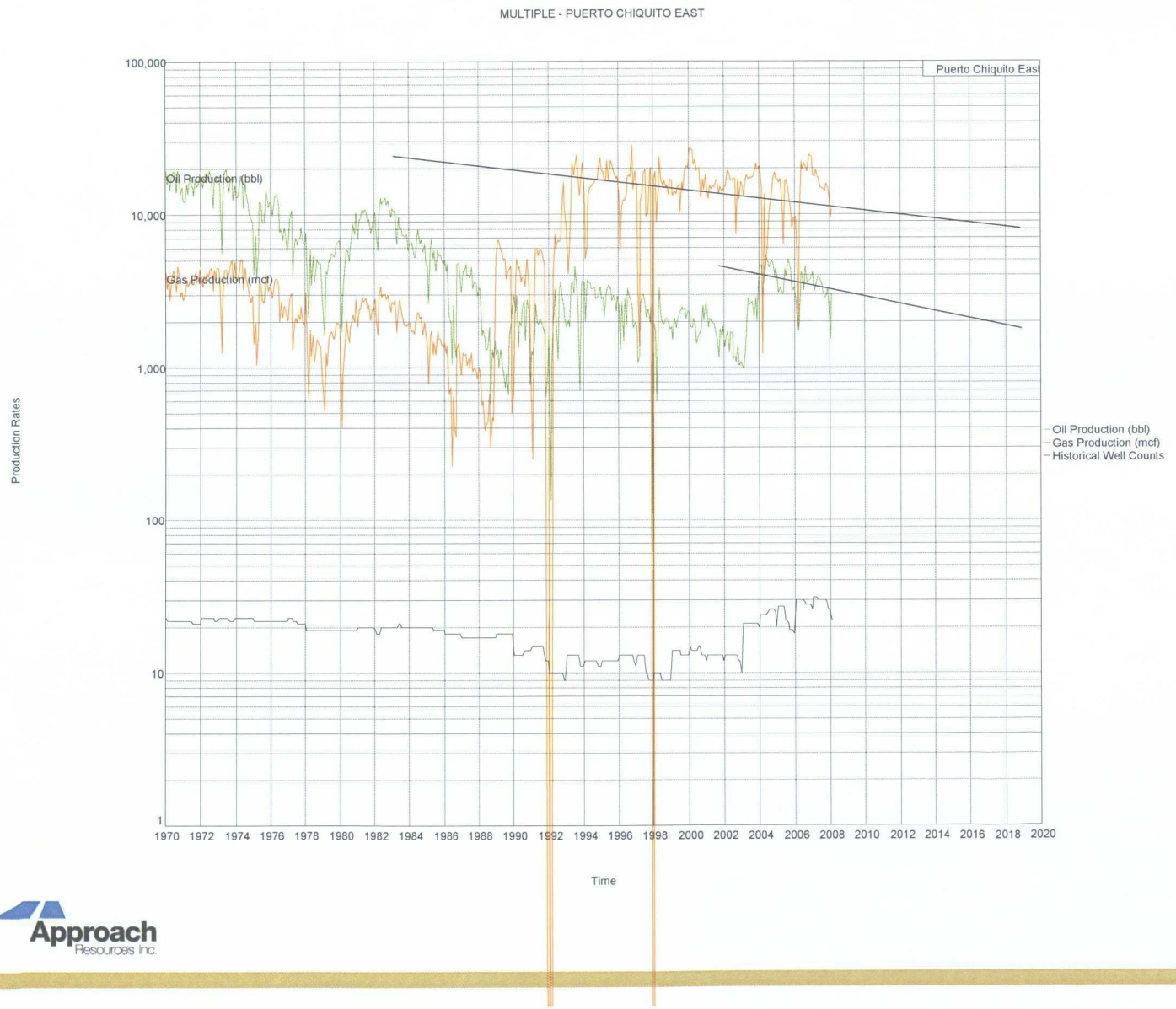
*(1) As of December 31, 2007 unless otherwise noted.*

# Proposed Locations Rio Arriba, New Mexico




Approach Resources Inc.

# Puerto Chiquito East Field - Production Summary




County

| ito East |
|---|
| n (bbls) |
| Well Count (per month) |
| Oil (bbls/month/well) |
| Gas (mcf/month/well) |
| MCFe (6:1 adjustment) |
| 4,729,519 |
| 514,000 |
| 5,243,519 |
| 50 |
| 104,870 |
| Cumalative Production |
| Reserves |
| EUR |

Approach Resources Inc.

# Puerto Chiquito West Field - Production Summary


Rio Arriba County

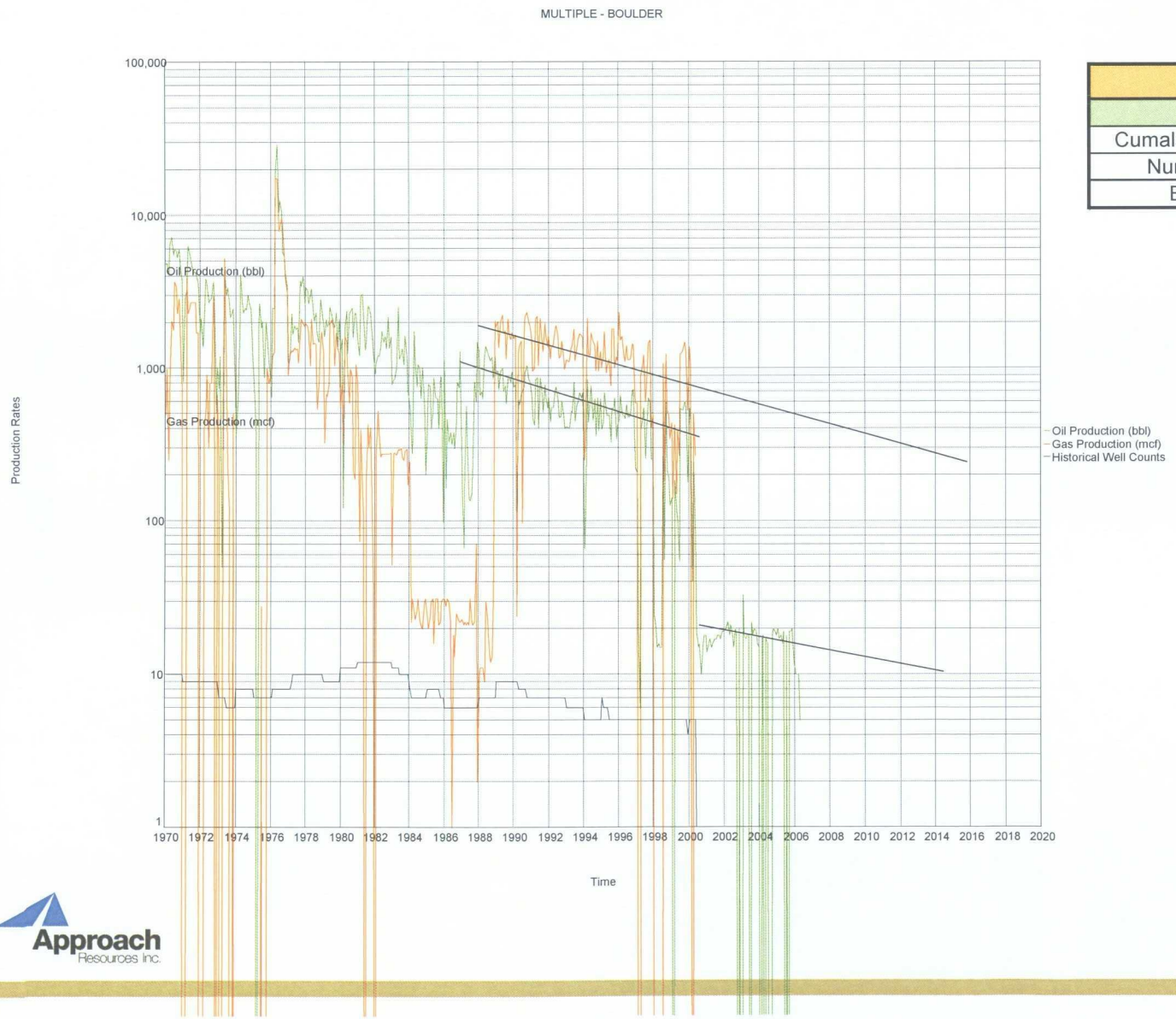
| rto Chaquito West | |
|---|---|
| Oil Production (bbls) | |
| Production | 14,342,893 |
| erves | 1,637,000 |
| JR | 15,979,893 |
| of wells | 56 |
| Well | 285,355 |

Well Count (per month)
Oil (bbl/month/well)
Gas (mcf/month/well)
MCFE (Mcfe/month/well)
Cumalative Production
Reserves
EUR

Approach Resources Inc.

# Boulder Field – Production Summary

Rio Arriba County




| Boulder Field | |
|---|---|
| Oil Production (bbls) | |
| Cumalative Production | 2,821,120 |
| Number of wells | 32 |
| EUR / Well | 88,160 |

Approach Resources Inc.

# Surface Pipe Depth and Size - 2000 to 2800 FT

## Puerto Chiquito Field – Rio Arriba County, New Mexico

| Lease Name | Well Num | Surface Pipe Size | Surface Pipe Depth | Driller TD | Proj Depth | Field Name |
|---|---|---|---|---|---|---|
| JICARILLA 287 | 11 | 7-5/8 | 20 | 2180 | 2300 | PUERTO CHIQUITO |
| BETSY | 3 | 7-5/8 | 40 | 2184 | 800 | PUERTO CHIQUITO |
| GREVEY | 2 | 10-3/8 | 30 | 2185 | 2300 | PUERTO CHIQUITO |
| JICARILLA | 16-20 | 10-3/4 | 99 | 2202 | 2800 | PUERTO CHIQUITO |
| BETSY-N | 20 | 9-5/8 | 60 | 2239 | 2400 | PUERTO CHIQUITO |
| SMITH | 1/G-3/ | 8-5/8 | 146 | 2242 | 2250 | PUERTO CHIQUITO E |
| PUERTO CHIQUITO | 3-5 | 8-5/8 | 53 | 2288 | 2300 | PUERTO CHIQUITO |
| JICARILLA | 8-30 | 9-5/8 | 87 | 2324 | 2850 | PUERTO CHIQUITO |
| USL-BAJO | 1 | 10-3/4 | 150 | 2357 | 2700 | PUERTO CHIQUITO |
| PUERTO CHIQUITO-MANCOS | 26 | 9-5/8 | 150 | 2511 | 3000 | PUERTO CHIQUITO |
| FEDERAL | 2-23 | 13-3/8 | 57 | 2630 | 2650 | PUERTO CHIQUITO |
| ROYAL-HARVEY | 1 | 8-5/8 | 100 | 2664 | 2700 | PUERTO CHIQUITO |
| CIDO | 6 | 8-5/8 | 200 | 2670 | 2700 | PUERTO CHIQUITO E |
| SILVER | 1 | 10-3/4 | 101 | 2675 | | PUERTO CHIQUITO |
| RD & P | 2 | 8-5/8 | 100 | 2697 | 2400 | PUERTO CHIQUITO E |

Avg Depth:
93

Approach Resources Inc.

# Wellbore Schematic - Rio Arriba Shallow Well

Approach Resources
Rio Arriba Well

John Marting 6/9/2008

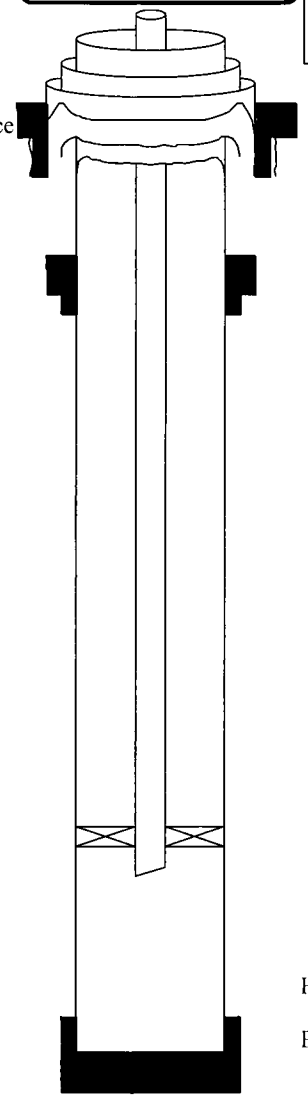
Generic Shallow Well

Rio Arriba Co.

TOC Surface Casing @ Surface

Surface Csg 9 5/8" @ 350'

TOC Prodn Csg @ TBD



Hole Size 8 3/4"

PBTD = 2000 '

Production Csg 4 1/2" @ 2000'

Call Steve Gillett @ ext 4748 for guidance in using this spreadsheet

Approach Resources Inc.

# Surface Pipe Depth and Size - 4000 to 6500 FT

## Puerto Chiquito Field – Rio Arriba County, New Mexico

| Lease Name | Well Num | Surface Pipe Size | Surface Pipe Depth | Intermediate Pipe Size | Intermediate Pipe Depth | Driller TD | Field Name |
|---|---|---|---|---|---|---|---|
| EAST PUERTO | 41 | 10-3/4 | 105 | 7 | 2722 | 4162 | PUERTO CHIQUITO E |
| JICARILLA | 8I-1 | 10-3/4 | 336 | 7-5/8 | 2100 | 4245 | PUERTO CHIQUITO E |
| FEDERAL 17-32 | 1 | 8-5/8 | 140 | 5-1/2 | 3800 | 4279 | PUERTO CHIQUITO |
| EAST PUERTO | 40 | 10-3/4 | 121 | 7 | 2553 | 4346 | PUERTO CHIQUITO E |
| JICARILLA TRBL 4-26 | 1 | 8-5/8 | 110 | 5-1/2 | 4400 | 4798 | PUERTO CHIQUITO W |
| CYNTHIA | 1 | 9-5/8 | 100 | 7 | 3300 | 4850 | PUERTO CHIQUITO W |
| JICARILLA 235 | 1 | 10-3/4 | 175 | 7 | 3999 | 4988 | PUERTO CHIQUITO |
| JICARILLA | 6A-1 | 10-3/4 | 329 | 7-5/8 | 2426 | 5026 | PUERTO CHIQUITO E |
| CANADA OJITOS UN | 18 | 10-3/4 | 332 | 7 | 4929 | 5265 | PUERTO CHIQUITO |
| CANADA OJITOS UNI | 2-18 | 10-3/4 | 222 | 7 | 4398 | 6092 | PUERTO CHIQUITO W |
| CANADA OJITOS UNI | 17 | 10-3/4 | 384 | 7-5/8 | 5739 | 6296 | PUERTO CHIQUITO W |
| CANADA OJITOS | 16-11 | 13-3/8 | 314 | 7-5/8 | 5263 | 6375 | PUERTO CHIQUITO W |

Avg Depth
222

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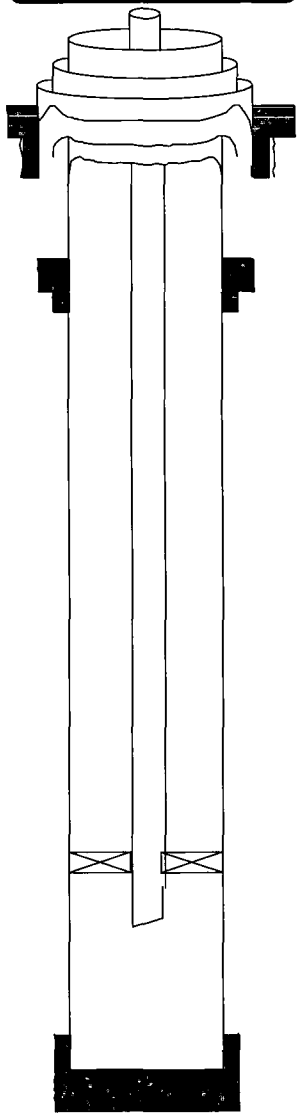
# Wellbore Schematic -Rio Arriba Basement Well

Basement Test

Approach Resources
Rio Arriba Well

John Marting 6/9/2008

Rio Arriba Co.



TOC Surface Casing @ Surface

Surface Csg 9 5/8" @ 350'

TOC Prodn Csg @ TBD

Hole Size 8 3/4"

PBTD = 6450 '

Production Csg 4 1/2" @ 6500'

Call Steve Gillett @ ext 4748 for guidance in using this spreadsheet

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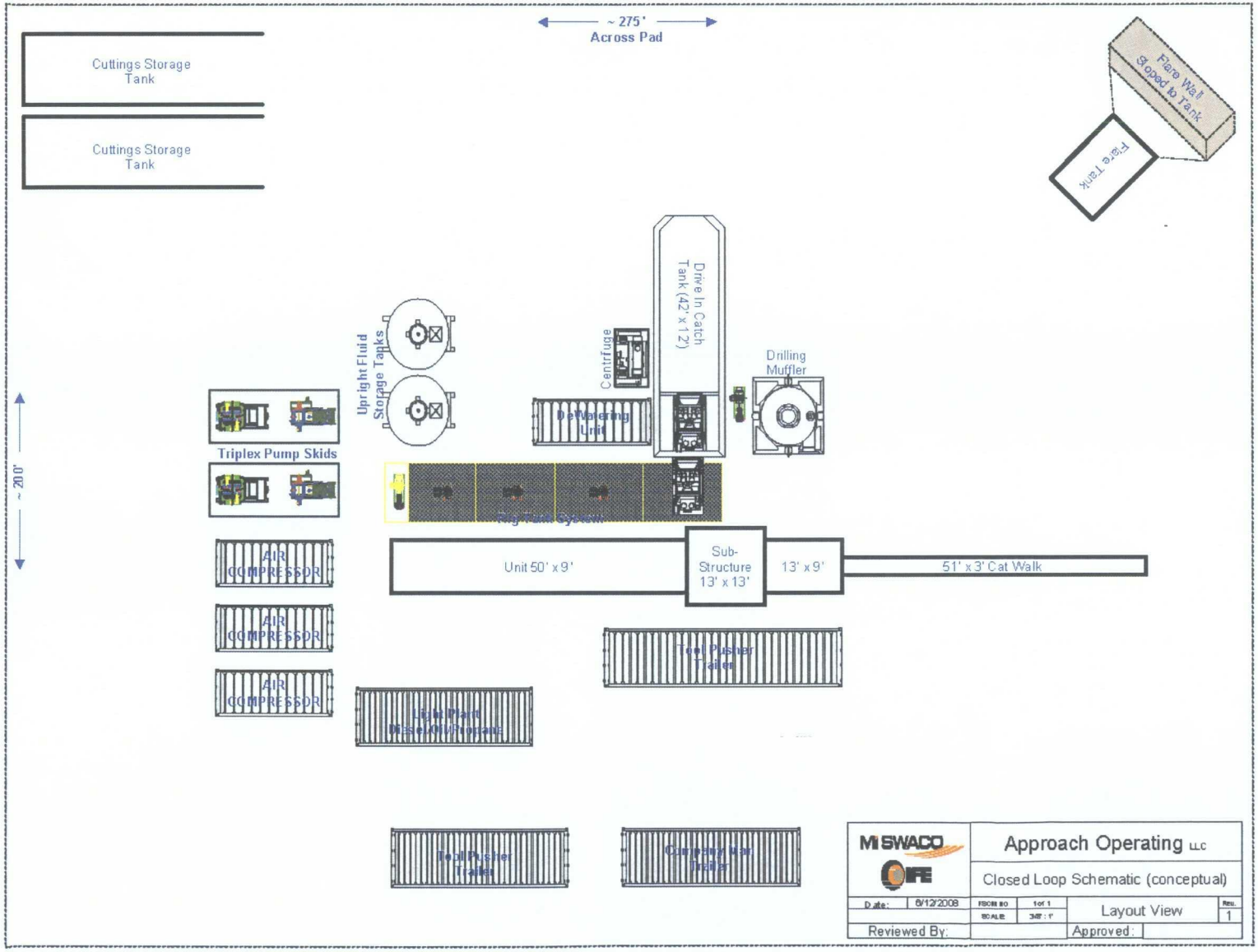
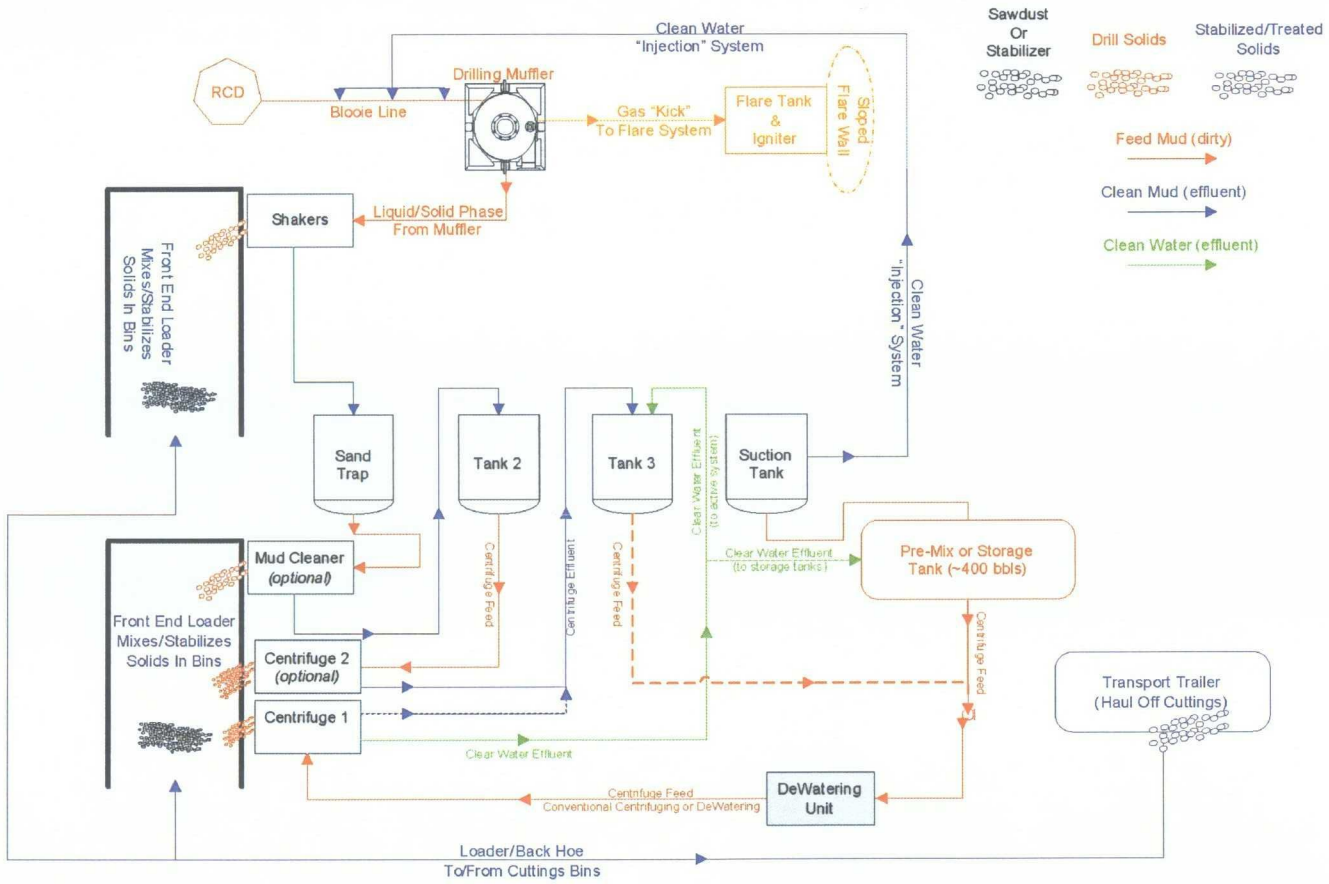
# Closed-Loop Schematic



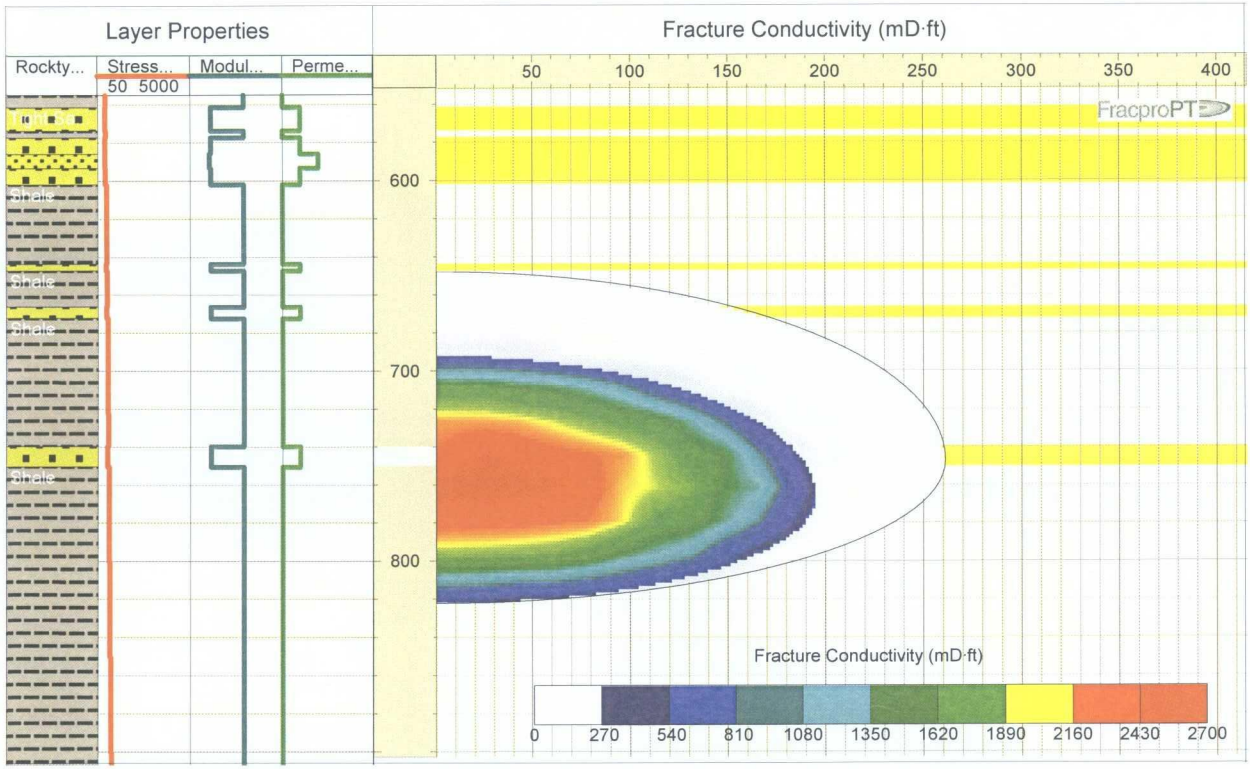
# Closed-Loop Schematic




| | | | | | |
|---|---|---|---|---|---|
| MI SWACO / OFE | Approach Operating LLC | | | | |
| | Closed Loop Schematic (conceptual) | | | | |
| Date 6/12/2008 | FSCM NO | 1 of 1 | Flow Process | Rev | |
| | SCALE | 3/8" = 1' | | 1 | |
| Reviewed By: | | Approved: | | | |

# Fracture Profile – 600’ to 800’

Fracture Profile with Logs and Layers - Spill Bros #1 API# 30-039-05013
Rio Arriba Co., NM, Wildcat Sandstone - 740 ft , AFE

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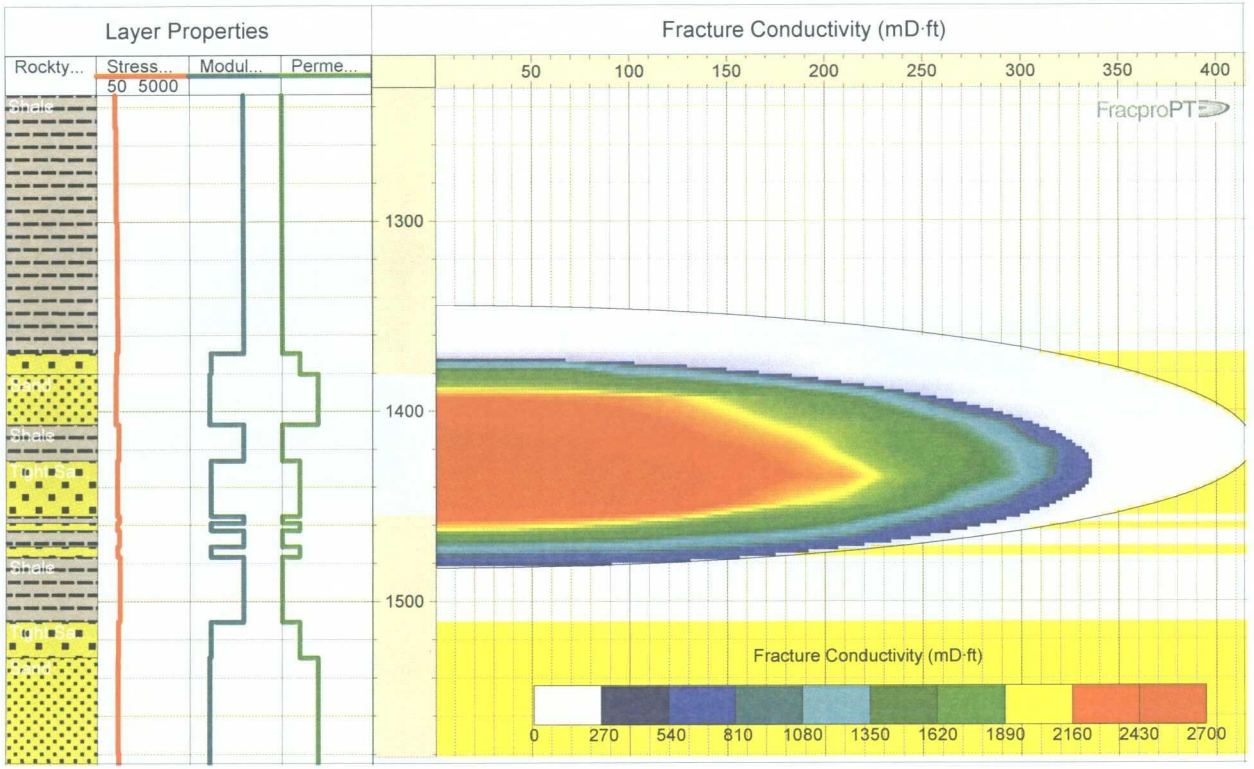
# Fracture Profile – 1300’ to 1500’

Fracture Profile with Logs and Layers - Spill Bros #1 API# 30-039-05013
Rio Arriba Co., NM, Graneros - 1400 FT Zone , AFE

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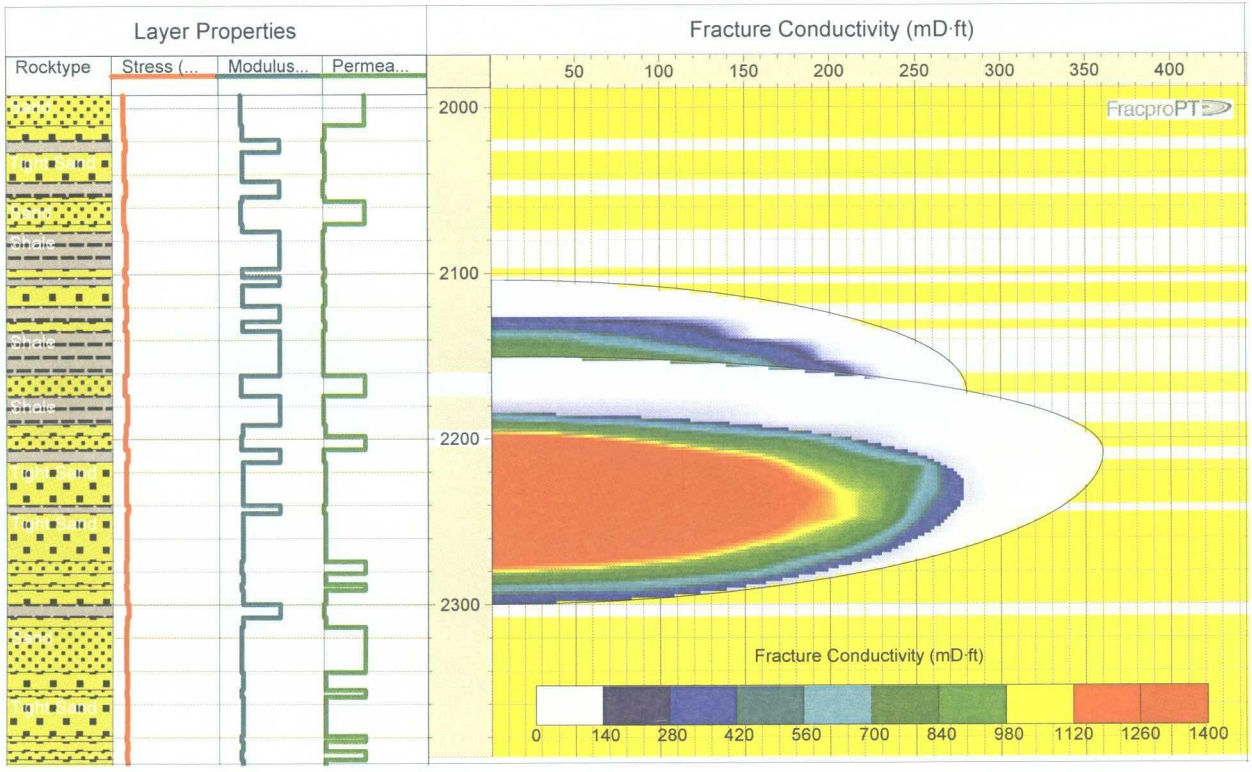
# Fracture Profile – 2000’ to 2300’

## Fracture Profile with Logs and Layers - Spill Bros #1 API# 30-039-05013

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