STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

CASE 10,023

EXAMINER HEARING

IN THE MATTER OF:

Application of BASF Corporation for a Horizontal Directional Drilling Pilot Project, Special Operating Rules Therefor, Non-Standard Oil Proration Unit and an Unorthodox Oil Well Location, San Juan County, New Mexico

TRANSCRIPT OF PROCEEDINGS

BEFORE: DAVID R. CATANACH, EXAMINER

STATE LAND OFFICE BUILDING

SANTA FE, NEW MEXICO

July 25, 1990

ORIGINAL

A P P E A R A N C E S

FOR THE DIVISION:

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FOR THE APPLICANT:

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ALSO PRESENT:

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WHEREUPON, the following proceedings were had at 10:47 a.m.:

EXAMINER CATANACH: At this time we'll call Case 10,023.

MR. CARROLL: Application of BASF Corporation for a horizontal directional drilling pilot project, special operating rules therefor, non-standard oil proration unit and an unorthodox oil well location, San Juan County, New Mexico.

EXAMINER CATANACH: Are there appearances in this case?

MR. CARR: May it please the Examiner, my name is William F. Carr with the law firm Campbell and Black, P.A., of Santa Fe. We represent BASF Corporation, and I have one witness.

EXAMINER CATANACH: Are there any other appearances?

Will the witness please stand to be sworn in?

(Thereupon, the witness was sworn.)

ED FRANK SPINKS,

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

DIRECT EXAMINATION

BY MR. CARR:

Q. Will you state your full name and place of

residence?

A. Ed Frank Spinks, Houston, Texas.

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

A. I'm employed by Wintershall as a wholly owned subsidiary of BASF.

Q. And what is the nature of Wintershall's business?

A. Wintershall is the oil and gas arm of BASF, who is the fourth largest chemical company in the world.

Q. The well that is the subject of this hearing will be operated in the name of BASF Corporation?

A. That is correct.

Q. Have you previously testified before the New Mexico Oil Conservation Division?

A. I have not.

Q. Could you summarize your educational background for Mr. Catanach --

A. Okay.

Q. -- and then briefly review your work experience?

A. Okay. I graduated from the University of Oklahoma, 1961, bachelor of science in petroleum engineering. I'm a Registered Professional Engineer,

State of Texas, and have been since 1973.

Upon graduation I went to work for Delhi-Taylor in Farmington, New Mexico, worked there until 1963 when Delhi was sold to Tenneco. Tenneco picked us up, stayed there until about the middle of 1964 when Delhi asked if I would like to go overseas with them.

I went to Australia, stayed there for eight years, came back in late 1972.

1973 I went to work for a consulting group, Eaton Industries of Houston, and stayed there until 1979.

1979 I went to work for Transco. We stayed there until 1980.

1980 I went to work for Quarrel Petroleum. Quarrel was bought by an English Company, Tri-Central, stayed with them.

And 1982 -- I mean 1984, Wintershall bought Tri-Central. So that brings me up to date.

Q. Have you had experience with directional drilling or highly deviated directional wells?

A. Very much so.

Q. And when was that?

A. Well, I -- As a consultant you get a pretty good, broad experience in everything. But in Transco, we were -- 1979, we were the third most active company

in the Gulf of Mexico. We had four engineers. Only Shell and Exxon outdrilled us as far as the amount of wells.

We only had four engineers, and I was the chief drilling engineer. So I had two platforms under my oversee at all times, and I just think we've done a -- As high as 70 degrees, we've drilled them, but I can't say I've drilled a horizontal.

Q. Are you familiar with the Application filed in this case on behalf of BASF Corporation?

A. Yes, I am.

Q. Are you familiar with the subject area and the proposed well?

A. Yes.

MR. CARR: We would tender Ed Spinks as an expert witness and petroleum engineer.

EXAMINER CATANACH: He is so qualified.

Q. (By Mr. Carr) Mr. Spinks, could you briefly state what BASF seeks with this Application?

A. Okay, we would like to drill a horizontal well on the southeast flank of the Verde Gallup field. We would also seek three exceptions to the statewide rules, the first being an exception to the well location.

We would like to only have to comply with a

setback to the boundary of the acreage dedicated to the well. We would also like to have 120 acres dedicated to this well, and we would like to have an allowable increased to include the total acreage dedicated to this well.

Q. You're seeking an allowable equal to the allowable that would be assigned to each of the tracts that you're going to dedicate to the well?

A. Yes, that's correct.

Q. What basically is the reason for this Application?

A. Well, we feel like that we can come into an old well here, an old field here, and drill a well and find some reserves utilizing a new techniques that's been used successfully in fractured formations elsewhere.

Q. And what sort of results are you hoping to obtain in this pool?

A. We hope to find oil in the fractured formation of the Verde Gallup.

Q. At this point in time have you been able to quantify what you're hoping to achieve?

A. I'm sorry, I can't tell you what we hope to get, but if it is like it's been in other areas, then we can expect a multifold increase over what we would

have if we drilled a straight hole.

Q. Let's go to what has been marked as BASF Exhibit Number 1. I'd ask you to identify this exhibit and review the information on this exhibit for the Examiner.

A. Okay, this is a land plat that shows the acreage that we control outlined in yellow, more specifically, Section 27, 28, 29, 32, 33 and 34. The outline in blue indicates the acreage that we would like dedicated to this well.

Q. Is the working interest controlled 100 percent by BASF Corporation in the area shaded in yellow?

A. Yes, it is.

Q. And is the royalty interest common throughout that area?

A. It is.

Q. It's all one lease from the Ute Indian Tribe?

A. Ute Mountain Indian, that's right.

Q. All right. There is, therefore, no offsetting interest owner to whom notice needed to be given of this hearing; is that correct?

A. That is correct.

Q. What is the current development status of the acreage that is shaded in blue on this exhibit?

A. This would be the first well that's been proposed in that area.

Q. There are a number of well spots on this exhibit. What is the status of those wells?

A. It's my understanding that all of the wells have been plugged with the exception of a couple of wells that are not in the immediate vicinity of the area that we'll be drilling.

Q. And were all of these wells drilled to the Gallup Formation?

A. Yes, they were.

Q. Let's go to what has been marked as Exhibit Number 2, and I would ask you to identify that, please.

A. Okay. Exhibit Number 2 is a copy of a log section, and this log section is from our well that we drilled in Section 28, more specifically our 28-43 Well.

We drilled this to the Basin Dakota, and it's located approximately due east of the proposed location.

Q. All right, what does this log section identify?

A. It identifies the Verde Gallup -- or the Gallup section that we intend to penetrate and drill a horizontal into.

Q. And what is your primary objective in the Gallup section?

A. The primary objective is this Gallup 5 Section that we have noted down there, but we hope that there are fractures throughout this Gallup formation so that the entire Gallup section is an objective.

Q. What is the general characteristic of the Gallup formation in this area?

A. It's a fractured shale.

Q. Let's go now to what is marked as BASF Exhibit Number 3.

A. Okay.

Q. I'd ask you to identify that and review it for the Examiner.

A. Okay, this is a structure map on what we call the Gallup 1. In other words, this is the top of the Gallup.

This shows that the Gallup section is very steeply dipping from the north to the south, and if you'll note the colored -- the yellow color there indicates the surface location of the well, which will be at 1112 feet from the west line and 1284 feet from the south line.

We would drill this well out to a point where the red dot is; that would be 2662 feet from the west

line and 1020 feet from the south line.

Q. And approximately what is the interval as indicated on the type log?

A. The interval here?

Q. That we're talking about depicting in Exhibit Number 3.

A. Oh, okay. The depth of the Gallup 1 is at a depth of 4080 feet. This is the top of it. And it continues on down until we come to the Gallup 2 section, which is approximately 4146 feet.

Q. All right, Mr. Spinks. Let's move now to Exhibit Number 4, and I'd ask you to identify and review that.

A. Exhibit Number 4 is our Gallup 5 marker, and it's the top of the zone that's shown on the log here at 4330 feet, and it runs down to approximately 4370 feet.

Q. Okay, and what does this exhibit show you?

A. It shows us a structure which is very uniform from the Gallup 1 all the way down through the Gallup 5.

Q. And again, the structure would suggest to you that you have a likely prospect to intersect the fractures in the Gallup formation?

A. Well, we think so, because it's very steeply

dipping, and if you'll notice how the formation is bent just at this point, we feel like that's one of the primary reasons that the fractures occurred in the Gallup field here.

Q. All right, Mr. Spinks. I'd now like to direct your attention to BASF Exhibit Number 5.

A. Okay.

Q. I'd ask you to identify that and review it for Mr. Catanach.

A. Okay. Exhibit Number 5 is an isopach of the section from the -- what we call our Gallup 1 to our Gallup 6, and at our location, bottomhole, we would be -- expect the thickness of this formation to be something like 297 feet.

Q. And let's go now to Exhibit Number 6 and have you identify that.

A. Okay, Exhibit Number 6 is the same thing, an isopach, but more specifically on the interval between Gallup 5 and Gallup 6.

Q. And again, this is the primary objective?

A. This is the primary objective, and this is the section where the horizontal well will be drilled into, and it's approximately 42 feet thick at this point.

Q. How will you insure that you're going to stay

within the section when you're horizontally drilling?

A. Well, we'll be continuously taking directional surveys. But in addition to that, we have a special tool that we're going to be using with this, and correct me if I'm getting ahead of myself here.

Q. No, go ahead.

A. This is something you can talk about later. But this particular tool, we're going to drill this portion of the hole with air, and as you well know, MWD is not reliable in this section.

But we're going to utilize a French tool that has been used in Michigan and other parts of the world, as well as -- Oryx just got through using it on a Niobrara well up in western Colorado, and it's a Geoservices tool, and it is a radio-type wave tool which does give reliable inclination and direction back to the surface in an airhole.

Q. So you don't foresee any problem in maintaining your position within the formation --

A. No --

Q. -- while drilling?

A. -- we don't. In addition to that, we will probably -- When we get horizontal, we will probably go ahead and attach some logs to our drill pipe, and we will probably go ahead and just run that out into our

deviated well, just to confirm that we are where we think we are.

Q. Okay. Let's go, now, to Exhibit Number 7, and I would ask you to first explain to the Examiner what this is, and then if we could start with the vertical diagram, I'd ask you to just review in detail how you propose to go about the actual drilling of this well.

A. Okay. We're going to start off drilling a 17-1/2-inch hole. We'll set 13-3/8-inch casing approximately 240 feet. At that point, we will drill out with a 12-1/4-inch bit.

Due to the steep dip of the formation out here, we will have to maintain control of our hole the entire time, so that we -- when we get down to our kickoff point we're not going updip, as we most likely would be doing if we just drilled it without the benefit of directional equipment.

We will drill down to a point about 3700 feet, we'll run a log, we'll correlate it, we'll check it with the other logs in the area. That will give us a good tie to where we think we're going to encounter the top of the Gallup formation.

We will then drill down to a point based upon what the log tells us. We're approximating that to be

at 3820 feet right now.

We will then go ahead and kick the well off. We will build it up at an angle, a rate of build of 10 degrees per hundred feet. We will continue this until we got to an angle of 45 degrees.

At this point we would set 9-5/8-inch casing. This would be at a true vertical depth of 4225 and a measured depth of 4270.

At that point, we will then convert -- All this time we've been drilling with mud. At that point, we would go ahead and convert to air, and we would drill with air to that -- from there down.

I will say that if we do encounter a lot of fluid -- Well, maybe I should say that before I state that, the reason we're going with air, it makes it a little more difficult to drill a well, drilling with air, but we feel like being in close proximity of this old field, that if we do encounter a fracture that is, in fact, tied into this old field, we're most certainly lose the returns. So that's the primary reason for going off with the air to start with.

Now, if we -- On the beneficial side, and we do encounter a lot of fluid, hopefully oil, then we probably will be forced to make an attempt to drill with oil-based mud. We will have that in reserve and

we will attempt it if we make too much fluid.

If lost returns is too great, then we'll just have to give that up, and we will be finished where we are at that time.

Continuing on and drilling the well, we should -- We anticipate we would be horizontal at a true vertical depth of 4460 feet. That will give us a measured depth of 4754 feet, and we would continue drilling horizontal for roughly another 1000 feet.

We would like to come to you fellows at that time and tell you that things are going good, we'd like to -- We're not getting too close to any lease lines and we would like to extend this if it is, in fact, going very well at this time.

Q. Even with any extension of the horizontal portion of the wellbore that you might anticipate, would you be closer at any point in time than 330 feet from the outer boundary of the acreage dedicated to the well?

A. No. In fact, you can see here, looking at the horizontal plane of this particular drawing that we -- that Smith has done for us -- we've only dropped about 264 feet in 1500 feet.

Now, we're assuming -- And this is a big assumption -- If you'll look back at your structure

maps, you'll notice that what we've tried to do is take one factor out of the drilling, and that is, we tried to go parallel with the dip.

If we can do that, then we've eliminated having to adjust for dip going up and down. But that, once again, will be determined by the log that we run in the well.

Anyway, we didn't just pick Smith, either, as a contractor. They have just drilled this well for Oryx up in the Niobrara. Oryx used air, and they had some problems. Good problems, I understand, but they did have some problems that are only peculiar to air. Nothing that certainly this part of the world isn't used to with air and gas drilling.

Q. Are there any special casing requirements that you're looking at in terms of your plans for the development of this property?

A. Well, we're going to run the 9-5/8 casing, is going to be special, across the buildup section. We're going to run a 40-pound C-95 casing across this interval. It's a lot stronger casing than what would normally be required, but when you made your bending load calculations for the deviated well, it shows that on a -- I remember the figures on a 15-degree bend. You exert something like 363,000 pounds of force trying

to shove these casing collars. So we're certainly going with a lot stronger pipe so that we can design for this severe angle here.

Q. What area do you anticipate will be drained by this well?

A. I wish I knew. I don't know.

Q. In your opinion, will --

A. I don't think, though, that you could expect it to be any less than a straight hole, that's for sure.

Q. Do you believe that the well you're proposing will effectively drain the acreage that you're recommending be dedicated to it?

A. Oh, very definitely, if the fractures are encountered.

Q. Do you think there will be any excessive drainage of offsetting properties?

A. No. If you look back at your land plat, we control all the acreage for a long distance around this well.

Q. Is there any way for you at this time to anticipate what the producing life of a well of this nature might be?

A. No, I can't. But I would say it would not be less than a normal well was back when it was drilled

straight.

Q. Now, Mr. Spinks, to be sure we understand what you're requesting, you're requesting that the proposed horizontal well serve all the proration units dedicated to it?

A. Yes.

Q. And you're proposing that three 40-acre tracts be dedicated to the well?

A. Yes.

Q. And you're requesting an allowable for the well equal to the combined allowables for each of the 40-acre tracts dedicated to it?

A. Yes.

Q. Have you reviewed your plans with the Bureau of Land Management?

A. Yes, we have.

Q. And would you identify what has been marked as Exhibit Number 8?

A. Exhibit Number 8 is a letter from the Bureau of Land Management that says they have no objections to us drilling this well.

Q. And how are you going to survey or know exactly where this well is located?

A. Okay, since it is very critical to stay on line with these -- with this particular well, we will

be surveying at all times with a continuously recording instrument.

Now, I will say this: One thing about the Geoservices tool, it does have -- It is interfered with the by the 9-5/8 casing. So until that survey instrument gets about 30 feet away from the 9-5/8 casing, then we will not have surveys.

We may go ahead and at that time utilize a steering tool or a wireline-type tool which will not be interfered with. But that hasn't been decided just yet.

But the thing we don't want to do is have an erratic hole. And if you'll notice -- Most of the horizontal wells that I've seen, been associated with in a nonoperating role, have really been very close to the planned objective.

Q. When you complete the well, will you have a record that shows the exact location of the bottom of the hole?

A. We will.

Q. And will you make that information available to the Oil Conservation Division?

A. You bet. We will send an as-built type drawing or an as-drilled drawing to the Conservation --

Q. And there would be supporting data available

if they decide to examine it?

A. Yes.

Q. Mr. Spinks, I believe you stated there was no other offsetting owner, immediately offsetting this acreage, to whom notice needed to be given for this hearing?

A. That is correct.

Q. In your opinion, will granting this Application be in the best interest of conservation, the prevention of waste and the protection of correlative rights?

A. We certainly think so.

Q. Were Exhibits 1 through 8 either prepared by you or compiled under your direction?

A. That is correct.

Q. And can you testify as to the accuracy of the exhibits?

A. Yes.

MR. CARR: At this time, Mr. Catanach, we move the admission of BASF Corporation Exhibits 1 through 8.

EXAMINER CATANACH: Exhibits 1 through 8 will be admitted as evidence.

MR. CARR: That concludes my direct examination of Mr. Spinks.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Spinks, did you say that the pool itself was in the later stages of development, or it's already been mostly depleted?

A. I thank that -- From my understanding, almost all the wells have been depleted in this pool.

As I understand, there's one or two wells far removed from our area that might still be pumping a small amount of oil. But by far the majority of the field has been depleted.

Q. Is it your intent to, hopefully, encounter fractures that haven't been encountered maybe in this area?

A. Yes, that is correct. What we'd like them to do is something like people have done with the Chalk area up there in south Texas. Even though we've had straight-hole producing wells, they've gone in between and encountered fractures that the straight holes did not penetrate. And hopefully that's what we can do as well.

Q. The horizontal portion of the well is how great a distance?

A. If you'll notice on the vertical section, it starts at approximately 4754 measured depth and runs to

5754. So right now we're talking about 1000 feet.

But what I would like to point out is, we would like to keep our options open, and if everything is going well, then we would like to come back to you guys and say we would like to extend this.

Q. How far would you like to extend it?

A. As far as we can, without getting in trouble, getting off the lease.

No, I -- if everything is going -- I suspect if everything is going well with air, it will mean we don't have a lot of fluid, so that will probably be a bad omen, but if we are drilling and drilling well with oil-based mud I think, then, that we'd like to go on as far as we can conveniently go.

Q. But you would still at that point like to maintain the 120-acre proration unit; you wouldn't want to include more acreage after that, would you?

A. If we continued out an additional distance -- well, I guess -- I guess to answer your question, initially, though, we probably would not. But that depends on what happens.

MR. CARR: And if they go beyond 120, of course they'd have to come back to you.

(Off the record)

Q. (By Examiner Catanach) The horizontal

portion of the wellbore actually traverses one or two 40-acre units or portions of one or two?

A. It actually extends out to -- Let me think now. We just barely get into the third 40-acre block with the bottomhole as proposed here.

Q. Okay, so it's mostly limited to that middle pro- -- middle 40-acre units?

A. That is correct, that is correct.

Q. There's not any of it on the western proration unit, western boundary?

A. Let me see. You're correct. It would be the -- You're correct, the middle block.

Q. Do you propose -- How do you propose to complete the well below the 9-5/8-inch casing?

A. Right now we don't have any reason to think that we should have a slotted liner. We would like to leave it open hole.

Q. Open hole?

A. Yes. We feel like that if we do have some problems, that we can always go back later on and slide something in there.

Q. And would the base of the 9-5/8 casing, would that extend down into the Gallup?

A. Yes, it would, approximately 20 feet. And that's our objective to do that, and we would log at

that point too, to confirm that we are where we think we are.

Q. I see. What is the rate of angle-build below the casing point?

A. It's about 14 degrees as shown here. However, we do show a tangent there of 163 feet.

Q. Uh-huh.

A. If we bring that tangent back up a little bit, then of course we can minimize that build, and I am leaning very much in favor of pulling that tangent back up a ways and lessening that build from 14 degrees to something around 12, which I think would be a little more easily achievable.

Really, the tangent section just gives us a little bit of latitude, if we're a little high or a little low in the formation relative to where we thought we were. It's just a little area there that gives us a little room to modify.

Q. Now, you mentioned -- Is it Smith who drilled the -- Did you say Oryx?

A. That's an Oryx well in western Colorado in the Niobrara shale, which is very -- I understand is the equivalent to the Gallup formation.

Q. Was it a similar type well?

A. Yes, very similar. However, it's my

understanding that they did not achieve a horizontal well, that they just drilled it a declining angle like so. But that information isn't available yet, so I'm not sure.

I have talked to Oryx about the well quite a bit. Of course, they don't want to talk about what they've got, but they're very helpful in discussing, you know, the garholes and pitfalls that you can have doing one of these with air, so I will say they've been very helpful.

Q. Was it the same type of tools that you use --

A. Exactly. Plus the fact you've got the know-how. These people have one well behind them. They will have drilled one or two more wells by the time they get around to drilling our well. They're on the second well right now, but they have not gone into the Niobrara yet.

So we're getting a little better expertise than we would normally get from the average directional people.

Q. You don't have any estimates of how much additional -- or how much this thing will drain if it's successful?

A. Gosh, I wish I could tell you that. I can't.

Q. You may get a two- or threefold increase in

production?

A. Yeah, it depends on the fracture system. Of course if we hit a lot of fractures, then it's going to drain us, you know, a fair amount of acreage, and of course it depends on the extent of the fractures, how long do they run?

Q. Uh-huh.

A. I really don't know how to predict that.

Q. Now, is the -- Is the direction of the hole pretty much determined at this point? That's not going to alter?

A. Most definitely. And if you'll refer back to the structure maps, that being Exhibit 4 and 3, you'll notice how the formation moves on contours of 100-foot intervals, and you can see how steep that dip is.

And what we've tried to do is take the dip out of our drilling of the well.

And I guess, then, our only decision was, do we go from right to left or left to right? And we went from left to right because we've had some fracture work done that indicated that in the area that we're talking about here is an area that should be highly fractured.

Q. Okay. Now, are -- Do the fractures within that formation generally run north/south? Are you trying to intersect the fractures perpendicularly?

A. I don't have the answer to that. All I can tell you is that we've look at the -- We've looked at an isopach of the production in the area, and the production, if you'll refer to this area right here on your structure map, we've found that there was very good production in this plane here.

MR. CARR: You're talking about Sections 21 and 29?

THE WITNESS: Yes, in the general area of this. In other words, we looked at this area here, and we felt like that this was an area of pretty high fracturing. So any well drilled in this direction should intersect something along there.

On the other hand, if you go further over on the structure, over here, it looked like that we should be drilling in a different direction over here. But I honestly can't tell you how they run. And I feel like it may even take more than one well to answer a lot of these questions out here.

Q. (By Examiner Catanach) But as far as the direction of the well, it won't change --

A. No, it -- Guaranteed.

Q. -- even if you determine that you're running parallel to the fracture?

A. Guaranteed, it won't change.

Q. Okay.

A. The only thing that would make it change would be if we do find out that these maps are totally incorrect and that the structure has changed. And if the structure's changed, that would make us just try to go parallel with it. But we don't anticipate that being -- We've got control out here, a lot of wells, so we feel like that -- What you said is correct.

The well should be drilled south 80 degrees east.

EXAMINER CATANACH: I believe that's all I have.

FURTHER EXAMINATION

BY MR. CARR:

Q. Mr. Spinks, how soon does BASF propose to commence this well?

A. We'd like to start it just as soon as we can get our permitting process finished.

MR. CARR: I have nothing further.

EXAMINER CATANACH: There being nothing further in this case, Case 10,023 will be taken under advisement.

(Thereupon, these proceedings were concluded at 11:20 a.m.)

* * *

CERTIFICATE OF REPORTER

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

I, Steven T. Brenner, Certified Shorthand Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I transcribed my notes; and that the foregoing is a true and accurate record of the proceedings.

I FURTHER CERTIFY that I am not a relative or employee of any of the parties or attorneys involved in this matter and that I have no personal interest in the final disposition of this matter.

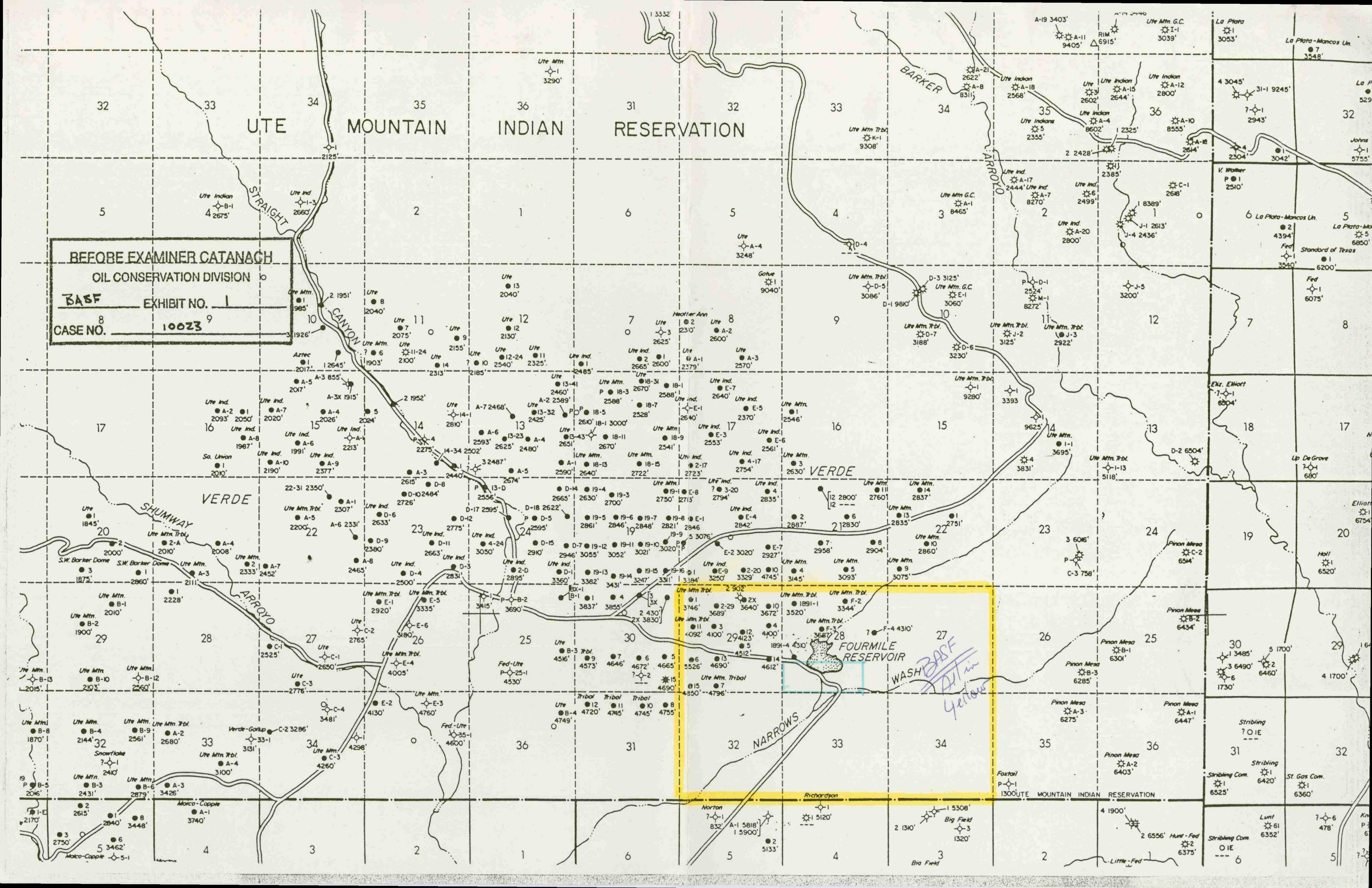
WITNESS MY HAND AND SEAL August 10, 1990.

STEVEN T. BRENNER
CSR No. 106

My commission expires: October 14, 1990

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 10023, heard by me on July 25 1990.

David R. Catanach, Examiner
Oil Conservation Division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