NEW MEXICO OIL CONSERVATION COMMISSION

COMMISSION HEARING

SANTA FE, **NEW MEXICO**

Hearing Date APRIL 20, 1977 **TIME:** 2:00 P.M.

NAME	REPRESENTING	LOCATION
Robert P. Wallach	Wallach Wallach & Huse	Eunice, New Mex
V. Steve Reed	Ed L. Reed & Assoc.	San Angelo Tx.
Glen Houston	Tom Lineberry	Hobbs, N.M.
Tom Lineberry		[illegible]
[illegible]		
Fred Boyd		Eunice, N.M.
Les Clements	N.M.O.C.C.	Hobbs, N.M.

Case 5899
Robt P. Wallach et al
for exception to R-3221,
Lea Co, N.M.

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
April 20, 1977

COMMISSION HEARING

IN THE MATTER OF: Application of Robert P. Wallach, Ray A. Wallach and Patricia Louise Wallach House for an exception to Order No. R-3221, Lea County, New Mexico.	CASE 5899

BEFORE: Joe D. Ramey, Secretary-Director
Phil Lucero, Member
Emery Arnold, Member

Daniel S. Nutter
Richard L. Stamets
Carl Ulvog

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the New Mexico Oil Conservation Commission:	Lynn Teschendorf, Esq. Legal Counsel for the Commission State Land Office Building Santa Fe, New Mexico
For the Applicant:	R. E. Richards, Esq. Attorney at Law P. O. Box 761 Hobbs, New Mexico
For R. D. Sims, Fred Boyd and Tom Linebery:	Glen L. Houston, Esq. Attorney at Law P. O. Box 1948 Hobbs, New Mexico

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EXHIBIT INDEX

MR. RAMEY: The hearing will come to order. We will call Case 5899.

MS. TESCHENDORF: Case 5899, application of Robert P. Wallach, Ray A. Wallach and Patricia Louise Wallach House for an exception to Order No. R-3221, Lea County, New Mexico.

MR. RAMEY: I'll ask for appearances at this time.

MR. RICHARDS: If it please the Commission, I'm R. E. Richards, Attorney at Law, Post Office Box 761, Hobbs, New Mexico, zip code 88240. I represent the applicants.

MR. RAMEY: Any other appearances?

MR. HOUSTON: Glen Houston, Box 1948, Hobbs, New Mexico, 88240.

MR. RAMEY: Will you have any witnesses, Mr. Houston?

MR. HOUSTON: Yes, I will.

MR. RAMEY: I ask at this time that all of the witnesses stand and be sworn.

MR. HOUSTON: Mr. R. D. Sims, Mr. Fred Boyd, Mr. Tom Linebery.

(THEREUPON, the witnesses were duly sworn.)

MR. RAMEY: You may proceed, Mr. Richards.

ROBERT P. WALLACH

called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. RICHARDS:

Q. Please state your name and address?

A. Robert P. Wallach, 1800 Avenue I, Eunice, New Mexico.

Q. Mr. Wallach, are you related to Ray A. Wallach?

A. Yes.

Q. Are you related to Patricia Louise Wallach House?

A. Yes.

Q. What is the relation?

A. Brother and sister.

Q. Do you, Ray A. Wallach, Patricia Louise Wallach House own the fee simple surface in the southwestern quarter of Section 29, Township 21 South Range 38 East NMPM?

A. Yes.

Q. How long has that property either been owned by you and your brother and sister or in the Wallach family?

A. Probably -- Bob, I'm not real sure on the date that thing was purchased.

Q. Give the Commission your best estimate.

A. That was approximately in 1945, I believe.

Q. And in the period since the time of acquisition and up to and including today, is there a sand, gravel and rock business being operated in this land?

A. Yes, that was in 1949 and 1950 the rock business and the sand and gravel business was started in that area.

Q. And who is the present operator of that sand and gravel business?

A. I am.

Q. Do you, as the operator of that business, lease and acquire materials from, purchase materials from your brother and your sister as co-partners or co-tenants?

A. Yes.

Q. Did this land pass to you all from the estate of your late father, Paul Wallach?

A. Yes.

Q. Did you, or your brother and sister contact and retain the firm of Ed L. Reed and Associates of Midland and San Angelo, Texas for the purpose of examining the gravel pit area that we just described for the possible purpose of the disposal of salt water or other oil field production liquids?

A. Yes.

Q. And are you here today as an applicant for an exception and spokesman for the three of you for an exception to Rule 3221 which prohibits the surface disposal except under specific permission of the Commission?

A. Yes.

Q. Historically, Mr. Wallach, tell the Commission in your own words what water is available in the area made up of the southwest quarter of that section?

A. Well --

Q. Subsurface water?

A. Well, we operate a sand and gravel operation which takes some water to operate and where we get the water for this operation is we have two water wells that are located in Monument Draw which is approximately two miles west of the pit area and they supplement the water that we purchase from the City of Eunice. Most of the water that we use to operate this plant is piped four miles and Eunice is where we purchase the water for this. Now, we have done extensive -- or my father did, at one time he was in the water well drilling business and he did extensive exploring around the pit area for water to operate this sand and gravel operation but never did develop any water in that line.

Q. Do you know about how many wells or test holes he drilled in the search for water around the pit area?

A. Bob, it was numerous but I can't recollect how many but he did extensive drilling in that area, around the pit area, trying to develop water for the operation and north of the pit we have a pit there that he even excavated down to the top of the Redbed formation and tried to develop some water there so we could have plant water there but there was not enough water there to furnish anything for the plant supply.

Q. Where was that now in relation to the current pit area?

A. It's north about a quarter of a mile or two-thirds

of a mile.

Q. Did it develop any water ever of any substantial amount?

A. Well, not substantially, no, enough to water cattle, et cetera, but nothing for commercial use.

Q. Was that seep water from the Ogallala?

A. I'm not sure, Bob, I couldn't testify to that.

Q. Mr. Wallach, let me ask you, and with the leave of the Commission, to attempt to move this along, to tell the Commission if they see fit to grant this application whether or not based upon the studies and recommendations of Reed and Associates, with whatever restrictions that the Commission might see fit to place on the operation if you, Ray A. Wallach, and Patricia Louise Wallach House would undertake to scrupulously follow any recommendations or directions which they might give to you as conditions to operate this facility?

A. Yes, we would.

MR. RICHARDS: I have no further questions.

MR. RAMEY: Any questions of the witness? Mr. Houston?

CROSS EXAMINATION

BY MR. HOUSTON:

Q. Mr. Wallach, on your operations there, you have dug down into the water sands, have you?

A. No, sir, not the water sands, no.

Q. Has water seeped into your pits?

A. Not in these pit areas that we are referring to here, no, sir.

Q. Now, as you drive up from the highway, from State Road 18, there is a pit on the right-hand side before you get to your office?

A. Yes, sir.

Q. And you have a pressure pump?

A. Yes, sir.

Q. And a pressure tank?

A. Yes, sir.

Q. And you are using that water for your office area, aren't you?

A. Right.

Q. Where does that water come from?

A. That is rain water, Mr. Houston, strictly. We had seventeen inches of rain three years ago, I think, and we caught twenty-five foot of rainwater in that pit at that time.

Q. And you installed your pressure pump and pumped at that time?

A. That pressure pump was installed about nine months later, I believe, unless it has been -- I think it was in August, I'm not sure, Mr. Houston. When we did the work for the Wallach Brothers on the four-lane highway down there we

used that water to make concrete with and also we do use it for office use right now.

Q. And that's sweet water?

A. That is rainwater, yes, sir, it sure is.

Q. Are there any fish in that water?

A. There is some bass, yes, sir.

Q. Did your father plant fish in some of the water out there when he was alive?

A. Well, he did, yes, sir, he sure did.

Q. When did he pass away?

A. He passed away in '75.

Q. He had retired many years prior to that, though, hadn't he?

A. Well, he had, yes, sir, he had retired approximately in 1962.

Q. And he had planted bass prior to that time?

A. Yes.

Q. Is there any vegetation in any of the pits?

A. There is salt cedar and some wild willows, weeping willows I guess you would call them, that have been in there.

Q. Now, there are some cattails also, aren't there?

A. Whereabouts are you referring to, Mr. Houston?

Q. Probably the north pit that your dad dug to --

A. Yes, in the north pit, three-quarters of a mile there is on the far end of that.

Q. On the north end of that there are cattails?

A. Yes, sir.

Q. And that water is fresh water there too?

A. That is fresh water, yes, sir.

Q. Now, have you in digging your gravel, have you used explosions to do your excavating?

A. Yes, sir, in the red formations we do use explosives.

Q. How long have you been using explosives?

A. Since we were in operation, since '49 or '50.

Q. And you have used substantial charges in order to dislodge the material or make excavations?

A. Not necessarily, Mr. Houston, it all depends on the strata, et cetera.

Q. What is the largest charge you recall using?

A. Now, personally or what my father had used?

Q. What you have used then tell us what you know your father used.

A. What we are doing now is drilling with an air track drill into the bank from the bottom of the formation and we probably shoot, oh, twenty or thirty holes at a time, charges, which is not an extensive amount of powder. Now, my father at one time used some free running powder in the big pit that you are talking about and put on an extensive explosion there to loosen up that material but that was back in, I believe 1954, '55 or somewhere along in there, Mr. Houston.

Q. Now, some of the maps which Reed and Associates have prepared at your request reflect the Baker Spring east of the pit area, do you recall where that is?

A. Yes.

Q. Does that spring still flow?

A. I'm not real sure, Mr. Houston?

Q. You have never been to it?

A. Well, I was over there and it had some water in it the last time I was there, but very little, I believe that was about three weeks ago.

Q. But you are not familiar with it like on a monthly or --

A. No, sir, I feel like when it rains a lot the thing fills up.

Q. You went there in connection probably with this hearing to see if there was water there?

A. No, I went over there to look for rattlesnakes. Somebody told me there was some snakes over there so that's why I went over there.

Q. Now, in connection with the pit areas are you still using all of the pits at the present time?

A. What are you referring to, all of the pits?

Q. There are several pits there, aren't there?

A. Well, there is an extensive number of pits, yes. The pit to the north of us is not being used, the furtherest one

north if that's one that you are referring to, where we tried to develop water.

Q. Where the cattails are?

A. No, it hasn't been used.

Q. Are the other pits being used for gravel and material?

A. Some of them are, not all of them, no, sir.

Q. Is there still material suitable for gravel, sand and gravel business, available in all of the pits on your property?

A. No, sir, not all of them.

Q. Which ones do not have sand and gravel material in them?

A. Well, we have worked some north, worked them out or into what they call sugar sand that are not feasible for concrete. The pits that we are referring to, the deep hole that you looked at, we have worked those completely out, extensively, where we can't work them anymore, the rainwater has drained in, that's been worked out. The pit area that we are proposing for, the big area for the water disposal is completely worked out, there will be no more evacuation in that particular --

Q. Could there be more if you were not successful in this application, would you use it for sand and gravel?

A. No, sir. We worked it out to the point where it's

not economical to work it anymore.

Q. And is that in the Reed report, is that denoted pit number one or do you recall?

A. That's pit number six I believe it is. Let's see, you are talking about the pit we're proposing to use. Let me clarify that, we are not taking any material out of these areas at all at this time.

Q. When did you last take any material out of them?

A. Oh, we've been working in the area we're are working in now for I imagine it has been a year ago since we worked the east end of the pit, the last pit that we've worked out. Now we are moving back north, in a northerly direction and taking some material out there.

Q. Are you down to the clay in the pit number six?

A. Pit number six is -- that pit is on the clay bottom, yes, sir.

Q. Now, what do they call that clay?

A. That's the Redbed, I believe.

Q. The Redbed?

A. Yes.

Q. Have you drilled any water wells in that area, in the Eunice area?

A. Have I personally?

Q. Yes, have you observed anyone drilling water wells, are you familiar with the terminology?

A. When I was in high school I worked on a water well rig.

Q. All right, where do we find our fresh water there in drilling down, where in relation to the Redbeds normally?

A. Well, it's been on the area but it is generally on top of the Redbed.

Q. Immediately on top of the Redbed?

A. Yes, well, this is my assumption here.

Q. All right, you're down to the Redbed --

A. If there is water there in the Eunice area, there's not much water.

Q. Well, there is a windmill just west of the pit where you turn off the highway?

A. Just west? There is one north, I believe. Just west of the highway?

Q. There is a homestead right there where you turn off to your property?

A. That is two miles from our pit area, yes, sir, that is down in the Monument Draw area. That's the wells I was telling you about that we supplement with.

Q. All right, are there windmills?

A. There have been windmills since the property was homesteaded, I assume, isn't that right? I'm not really sure, Mr. Houston, there are wells there now, like I say, we are using two wells there now.

Q. Were they there when you first saw the property?

A. Mr. Jones homesteaded that place and there was a windmill there at that time, yes, sir.

Q. And that windmill is drilled down to the Redbed?

A. I have no idea.

Q. As a boy when you worked water wells in that area they drilled down to the Redbed and usually got their water right above the Redbed?

A. Well, you know that all depends on what area you were in. I know, you know, it was hard to find water in the Eunice area, real hard.

Q. Are there any other windmills to the north of your pits?

A. There is one over on Mr. Stevens' property, Bill Stevens. It used to be owned by Pete Stevens.

Q. Are there any windmills to the east of your property?

A. Well, I'm sure -- how far east?

Q. Within a mile or so.

A. There is an old well on Monroe Baker's old place which is probably three-quarters of a mile.

Q. Would that be closer to your property than the Baker Springs or farther away?

A. I imagine it is about the same distance.

Q. Are there any windmills south between your pits and

the Andrews Highway?

A. No.

Q. Do you own all the way to the Andrews Highway?

A. Yes, sir.

MR. HOUSTON: I believe that's all.

MR. RICHARDS: If it please the Commission, I didn't mean this -- who does Mr. Houston represent in this proceeding?

MR. HOUSTON: As I introduced them.

MR. RICHARDS: As individuals?

MR. HOUSTON: Yes.

MR. RICHARDS: That's fine.

MR. HOUSTON: If it please the Commission, when I qualify my witnesses one of them is the President of the Fee Land Owners Association of South Lea County but they are also citizens of New Mexico and Texas.

REDIRECT EXAMINATION

BY MR. RICHARDS:

Q. Mr. Wallach, let me see if I can clear up something, I'm a little confused. Are you familiar with the areas which are contained within the Reed report?

A. Yes.

Q. Described as pit areas one through six?

A. Yes.

Q. Are you working out any sand, gravel or other

materials from any of the areas enclosed within the Reed report and described as one through six?

A. No.

Q. The cattail pond, is that included within the numbers one through six in the Reed report?

A. No.

Q. Is it approximately three-quarters of a mile north-northwest of the middle of these pits?

A. Yes.

MR. RICHARDS: That's all.

CROSS EXAMINATION

BY MR. RAMEY:

Q. Mr. Wallach, on this cattail pond, you say your father excavated this pit?

A. Yes.

Q. Seeking water?

A. Yes.

Q. Is there water in the pit?

A. There is at this time, yes.

Q. Well, the cattails is an indication that there has been water a long time, I assume?

A. Well, we had a pump there at one time. Can I clarify this?

Q. Yes.

A. We had a pump that we tried to pump water to our plant to furnish water, you know, to help supplement for the operation of the sand and gravel pit. This thing, you could pump it a day and the thing would go dry, it was this type, and we discontinued this and the last time we used that pit there was a drilling rig that drilled a little bit north of us and we tried to furnish water for that rig, or he wanted to try to get water out of that pit. Well, he pumped for awhile and the thing went dry and he couldn't use it or it went practically dry to where we couldn't use anymore water out of it so he run a line from our plant and picked up water there and used it for his well, from that source and I believe that is the last time that thing has been used.

Q. But this pit does have other rainwater in it?

A. Yes, it does have.

Q. The water seeps?

A. Yes, it seeps.

Q. I think you said from the Ogallala?

A. Well, I didn't say Ogallala, I don't know where it seeps from, you know, the bottom of the formation there.

Q. It's not rainwater in the pit?

A. No, this would not be, we do not have any rain drainage into this particular pit.

REDIECT EXAMINATION

BY MR. RICHARDS:

Q. Let me ask you, in addition to the pit to the east side of the road where you say you are pumping, is there another area close to the plant that has water in it?

A. State that again.

Q. To the pit to which Mr. Houston referred, immediately adjacent to the entrance road that has some rainwater, is that right?

A. Uh-huh.

Q. Now, is there another pit very close to the plant that has rainwater in it too?

A. Yes, sir.

Q. And are either of these self-recharging to your knowledge or are they both dependent upon rainwater?

A. Both are dependent on rainwater. I would like to clarify something else, Bob. Now, Mr. Houston asked a question about us working in a pit area, is that pit -- could I see the map -- let me make sure. Okay, we are working in this pit back here only this is not a pit.

Q. Well --

A. I would like to clarify this for Mr. Houston. Pit two, we are extending it back at this time and I'm sorry, I didn't make that clear at that time. That's where the bench is and we are going over the bench and that's where we are working in this area now.

MR. RICHARDS: Nothing further, Mr. Ramey.

MR. RAMEY: Any other questions of the witness? Mr. Nutter?

CROSS EXAMINATION

BY MR. NUTTER:

Q. Mr. Wallach, the pit that has been referred to as the cattail pit, would that be the one that is up in the north part of Section 29 there? The application is for the pits that are in the southwest quarter of Section 29?

A. Yes, sir.

Q. And I think you mentioned this cattail pond is some three-quarters of a mile north?

A. Yes, sir, that is the pit area there.

Q. So that would be where there is natural seepage into the pit that recharges that water?

A. Yes, right.

MR. NUTTER: That's all, thank you.

MR. RAMEY: Any other questions of the witness?

MR. STAMETS: Just a couple. Mr. Wallach, do you know how deep the wells are that you get water from?

MR. WALLACH: Approximately eighty feet.

MR. STAMETS: So they are probably getting water from the top of the Redbeds too?

MR. WALLACH: I'm sure they are, yes, sir, well, that's where they are coming from.

MR. STAMETS: Thank you. That's all.

MR. RAMEY: Mr. Lucero?

CROSS EXAMINATION

BY MR. LUCERO:

Q. You said that your father had attempted to find water and had drilled several wells?

A. Yes, sir.

Q. Is this around the edges of these pits or --

A. Well, he did extensive -- anywhere in the area that he thought he might -- I think he drilled wells down to six hundred feet and developed no water at all in those areas. That's right up by the pit area is where he was trying to develop the water in this area there.

Q. Did he keep any field notes or any results of this drilling?

A. No, sir, he sure didn't. This was back several years ago when he first developed the area up there.

Q. Since then there are traces of water that seeped to the surface in any number of these pits in the conduct of your business then?

A. No. The pit areas that we are referring to have no seepage at all from out of these sand and gravel formations on top of the Redbed that we are talking about on the -- in other words, this material, we are working what we call a red

conglomerate up there. I guess that Mr. Reed can probably explain this a lot more than I can but when we blast this thing and shoot it there is no -- the only time we get any moisture in these beds is when we have extensive rainfall but this is a dry process I go though on my sand and gravel operation in these red conglomerate pits. All of the material that came out of these pits is, the first primary step is a dry screen process and that's what we go through. We go through, we don't wash it on the primary screen. Everything that comes out of these pits are dry, they have to be to go through the plant, so this is what we are referring to here.

Now, the deep hole was a little bit different there but the pits that we are working now with the red conglomerate Redbed in it is all a dry process.

Q. Where is the nearest fresh water well to the pits that you intend to utilize?

A. I imagine Stevens' windmill, probably a mile north and then I think that the Baker Springs is three-quarters of a mile and there is an old windmill, it's not being used now to my knowledge, on the Baker place there. I think it's blown down and I don't think it's in use now. It is about three-quarters of a mile due east of us.

Q. What kind of vegetation is around the pit area, let's say within a mile or two of the pits?

A. Mesquite and shinnery and some grass.

MR. LUCERO: That's all.

MR. RAMEY: Any other questions? The witness may be excused.

(THEREUPON, the witness was excused.)

VICTOR STEVEN REED

called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. RICHARDS:

Q. For the record please state your name?

A. Victor Steven Reed.

Q. Mr. Reed, where do you live?

A. 1900 Sherwood Way, San Angelo, Texas is my office.

Q. By whom are you employed?

A. By Ed L. Reed and Associates.

Q. Mr. Reed, tell the Commission a little bit about your education and background?

A. I received a Bachelor's degree in geology at Northern Arizona University in Flagstaff and I went on at Northern Arizona University and completed a Master's degree at the same university, with a Master's thesis on Precambrian Redbed formations near the bottom of the Grand Canyon.

Q. Is Precambrian Redbed formation -- what relationship

does that bear to the Redbed we are talking about?

A. Well, it is a similar kind of formation, considerably older but in many characteristics it is quite similar.

Q. During the period of time that you were studying at Northern Arizona were you employed?

A. I worked from 1967 through 1975 which was the time that I was going to school, with the U. S. Geological Survey branch of Astro-Geology. I was a cartographer for the first three and a half years of that time and a geologist with the Apollo field geology team in the last part of that eight years.

Q. How long have you been associated with Ed. L. Reed and Associates?

A. A little over two years.

Q. What is the business of Ed L. Reed and Associates?

A. We are consulting hydrologists.

Q. In the organization of Ed L. Reed and Associates is there a certain primary division of interest in certain types of work?

A. Well, yes, there is, I, myself, the large majority of my work is in disposal related problems, environmental problems, environmental impact statements but there is a great deal in connection with disposal projects. Similar kinds of things that I have been involved in are disposal sites in playa lakes, salty playa lakes. I'm presently working with Sandia Corporation right now in the nuclear waste disposal site down near

Carlsbad.

Q. What is the function of a hydrologist in nuclear waste disposal?

A. We are examining the hydrologic characteristics of the formations that the material will be placed in if this is done, as well as examining the hydrology above and below this depository zone to predict over the next two hundred and fifty thousand years what would happen in this area.

Q. Are you a member of any professional societies or registrations?

A. I'm a registered professional geologist for the State of Arizona, I'm a member of the Geologic Society of America, American Society for the Advancement of Science and Society of Economic Paleontologists and Mineralogists, as well as the West Texas Geological Society.

Q. Are you a registered geologist in the State of Texas or New Mexico?

A. No, I'm not but neither of these states require or have registration for geologists at this time.

Q. All right, sir. Mr. Reed, in the course of your business were you contacted by the so-called Wallach brothers and sister to undertake an investigation and study for them?

A. Yes, sir, my firm was contacted.

Q. Were you in charge of that study?

A. Yes.

Q. And you prepared a report?

A. Yes, I prepared a report, it summarizes my findings.

Q. Please tell the Commission how you approached this project and what you in fact did?

A. Okay, the first thing we did, of course, was to go to the site and make a preliminary investigation. It was a very quick investigation, about an afternoon's work, driving around the site, looking it over and seeing if there was any point in going any further and it appeared to both myself and one of the members of my firm who visited the site that it was worth pursuing. So with this in mind I went to the field and with the aid of a drill rig provided by Wallach, we began drilling a number of holes in the area, again looking at the characteristics.

To give a little bit of setting this is a USGS topographic map which was shot from a one forty-four thousand map. This is essentially the outline of the pit that we are talking about now. The configuration has changed a little bit since this map was produced but not too much.

If you will follow one of these contour lines, such as this thirty-four fifty contour line, you will notice that the pits themselves are on a nose, so to speak, but they reenter here and not surprisingly at that reentry is Baker Springs and again the topography curves around this way. This is a high spot, these are low reentrance into this high terrain

to the north.

MR. NUTTER: Mr. Reed, while you are on that would you point out the cattail pit, please?

A. I believe it is up in here.

MR. NUTTER: That is that old area where there is a mining symbol shown then?

A. That is correct and if you will notice the location of that it is back beyond the front of this nose, it is now in line with Baker Springs, along this trend. It is not out on the nose and that will be an important point later on.

Again with the aid of this drill rig we drilled almost eighty holes out in this area. I must emphasize that these were all drilled with air, no water was used to drill any of these holes. We completely circled all of these pits which really is one major pit which was mined in several segments and it is now all one pit. So we essentially completely surrounded these pits and this outline here that you see right here is essentially the outline of the pits as a whole.

While we were drilling I was out there not only to watch the samples as they came out of the drill rig, but also I had a plane table man out there and I shot in those surface elevations of the locations of these drill sites as well as elevations both in the bottom of the pits and up on the ridge.

You can see right here on this what is a contour map

of the surface as I constructed it from my data I took here in the field during the test drilling. This is a fairly deep pit, these are contours going down into the pit. This is a very long, low pit here. This one is somewhat shallower. This is a very deep pit and this one which is called the two by four slopes gently up to the north and there is a small pit right here. Here is another pit that is also fairly deep.

Q. (Mr. Richards continuing.) In conjunction with the surface topographic map which I believe that you just displayed is also figure number two or three, figure number three to your report. Have you brought the Commission some photographs that might --

A. Yes, I do. I would like to show them now so we can get a setting of this whole thing because it is a little confusing.

Okay, this is a shot essentially looking north to perhaps northwest. Here is one of the large pit areas here that you can see the rim of. That is this pit right here.

MR. RAMEY: Would you kind of identify those pits as to direaction, east pit, or --

A. Okay, this is the easternmost pit or this one right here.

Q. (Mr. Richards continuing.) Is that pit described as pit number two in your report, sir?

MR. WALLACH: Mr. Chairman, I believe that is

described in the report as pit number three.

A. Number three, that is correct.

MR. LUCERO: Excuse me, before you go on to the next slide, is all that green around there grass?

A. Well, grass and mesquite and other things.

MR. RICHARDS: Mr. Commissioner, these were taken in, and if I may, I'm aware of the circumstances under which they were taken. They were taken two days after we finally got some rain and that shinnery and that mesquite down there that is -- the cattle had just been taken off the shinnery when this picture was taken.

MR. WALLACH: We would like to have that much grass.

MR. LUCERO: Well, did that much grass grow in two days after the rain?

MR. RICHARDS: Yes, sir, that country turns green over night. The shinnery was coming out about the time these pictures were taken.

MR. LUCERO: But it is all grass all through the whole picture. I didn't see any bald earth or anything like that.

MR. RICHARDS: Well, it's grass green down there.

MR. LUCERO: Okay, thank you.

A. Okay, this is a little closer shot of the same pit. This is again the easternmost pit or pit number three. You can see the steep walls of the pit. Again that shot, this back

wall, essentially looking at this portion right here, you can see the pit there is quite deep as reflected by these contours back here.

Q. (Mr. Richards continuing.) What is the material in the bottom of that pit, Mr. Reed?

A. Throughout the entire bottom of this pit is Triassic Redbed. As a matter of fact, you can see a small portion of the Triassic right there, the Triassic Redbed you can see just a tinge of red in here. That is all Triassic and a little more difficult to see but this right here is a bench or a terrace that is about three feet above the level of the rest of the pit. There are minor little erosional channel. Just a few inches deep in this terrace you can see very good looking Triassic.

Q. Is there anything else of significance that you wish to tell the Commission about?

A. I believe I would like to go on to the next slide.

Okay, this is looking now a little bit further to the west of that first pit. This is primarily in this area right there. This pit that you can just barely see in the background, right here, is pit number two. The rest of this right in here and incidentally it goes behind this pile of spoil right here, is this portion of the pit right here.

MR. RAMEY: What pit number is that, Mr. Reed?

A. This large pit right in here I called number one, if

I'm not mistaken.

MR. WALLACH: It's a seven and a half acre pit.

A. It's a large pit in the central part of the area. This road right here again comes up right in through here going this direction.

MR. LUCERO: Sir, could I ask you one thing on that one too, that one slide. How far away was that picture taken there?

A. I didn't take these.

MR. LUCERO: Is it on top of a little hill?

A. No, these were taken from an airplaine. This I believe was a two hundred millimeter.

MR. RICHARDS. It was a two hundred millimeter lens at approximately twenty-five hundred feet and five hundred feet elevation, sir.

MR. LUCERO: How deep are those pits where you show the red and everything right there, by the road right there, from the highest point there?

A. How deep is this pit here?

MR. LUCERO: Yes.

A. I can't read the slide very well so I'll have to -- The surface up there on that rim is an elevation of thirty-four sixty, that's sea level elevation. Down there in the bottom it is thirty-four forty-four.

I would like to have the next slide here. Okay, again,

this is a little farther down to the west. We are now looking at an area right in here. This gray area right here is water, again run-off water in the bottom of this pit which is number five. This deep pit is just off to the left of this photograph but this is again part of the largest pit that we have in this area, right in here. This that you see on your map is boulders, represents these boulders here and to the right.

See a spot right there with a little bit of a red tinge, that's Triassic Redbed right there in the bottom of the pit. On the ground you can follow that red on up this road. In fact, I have drilled holes up that road.

This is a little better overview of this centralized pit, the larger pit, pit number one, essentially this whole area right in here. Again, the boulders that you see illustrated on my map right in here represent this line of boulders right here.

Next slide, please. This is a photographic view further to the west, the rim that you see right here extends all of the way back into about here is the large, very deep pit right here.

The elevation differences up on the rim is an elevation of somewhere around thirty-four fifty six, thirty-four sixty. The water's edge when I was out there was thirty-four twenty-four and the pit is quite a bit deeper than that.

MR. LUCERO: Could I ask a question with respect to

the showing of the slides and the map?

A. Yes, sir.

MR. LUCERO: Is the top of it north?

A. Yes, the north arrow right here, it's not quite north but it is essentially north.

MR. LUCERO: I'm sorry, I couldn't see it.

MR. RICHARDS: The photographs basically, Mr. Commissioner, were taken on a east to west course generally in line and parallel to what would be the bottom of the map.

A. This slide again shows an overview of this area. It shows again the very deep pit to the far west with its somewhat vertical walls and as you walk along these walls you can find Triassic outcrops all the way around the pit. This pit that you see down at the bottom of the photograph is pit number six. Pit number seven will be just off to the right of the slide.

MR. LUCERO: Is there something growing, is there something that looks like it's green there?

A. That's just vegetation, again from rainwater coming down and settling in the top of that pit.

Q. (Mr. Richards continuing.) In addition to your surface elevations, Mr. Reed, did you do a study of certain Triassic elevations?

A. Yes, I did. In order to evaluate these pits from the standpoint of being able to discharge brine into them,

obviously we've got to be able to contain the brine. We can't just get them down to the Triassic and leave them there if it happened to be a nice flat surface. Again we drilled something on the order of seventy-five to eighty test holes into the Triassic.

This next slide shows, without any surface elevations on it, it shows the configurations of the top of the Triassic Redbeds. All of these dots that you see, the black dots, those holes encountered Triassic somewhere in them. Again I will emphasize that all of these holes as well as the ones outside and inside, were drilled with air.

Q. Was the Triassic Redbed all at the same elevation as it regards sea level?

A. No, sir.

Q. Is there a significance to that?

A. Yes, there is. Essentially there is an east-west trending trough in the Triassic Redbeds. The Triassic Redbed rises in elevation to the north and it rises in elevation to the south. This contour line that you see right here is on a high spot in the Triassic here on the step. This contour line right here, the elevation thirty-four fifty-five. This one is thirty-four fifty. It shows again that once you get out of this pit area that the Triassic is rising in elevation to the north.

Contrast this thirty-four fifty-five elevation with

the exposures, the surface exposures of Triassic in the bottom of the pit is somewhere in the neighborhood of thirty-four forty-five, sometimes less than that, but thirty-four forty-five, at least in the pit one area, is a fairly consistent elevation for the Triassic in the bottom of the pits and these are not elevations that I just merely took off the ground and assumed they were Triassic, I drilled several holes in the pits themselves to make sure we were in good Triassic Redbeds.

The Triassic in pit number three is as deep as thirty-four forty. In pit number four, the deep pit to the far west, the Triassic is as deep as -- well, the top of the Triassic in that particular pit again is about thirty-four forty and the pit is dug down into the Triassic.

Q. Mr. Reed, in layman's terms, does this Triassic Redbed undulate or form a trough or bowl or saucer in the area of these pits?

A. Well, essentially it represents a linear trough aligned in an east-west direction. The trough opens up on the west side, it opens up on the east side. In other words this is high country as far as the Triassic is concerned and this is high country as far as the Triassic is concerned. this is an arroyo that cut into the Triassic on an east-west trend.

Q. Is this arroyo the area in which the sand and gravels were deposited?

A. That's correct and it's not coincidental that they

find the gravels in this deep channel. It is there because the channel is there.

Q. Mr. Reed, please continue. After you told us you did some surface elevations and then determined some of the elevations of the Triassic, be good enough to tell us what you next did in your investigation?

A. After these surface maps, the Triassic map was constructed, I took a look at both of the maps together in order to evaluate the feasibility of using these pits for storage and disposal of salt water.

Using primarily the Triassic map, I looked particularly for areas in the Triassic that were low spots, in other words, small swales, any small swales in the Triassic where the Triassic was slightly lower in elevation I noted particularly. And the reason for this is obvious. Any time we have the Triassic up high around the periphery of these pits, we are in very good shape as far as holding the brine in these pits.

There are a few areas where there is a bit of a Triassic swale. I pointed it out to you just awhile ago. There is a low spot on the east side and on the west side in conjunction with this linear trough. There is a very slight swale, a low spot in the Triassic of just a few feet just to the south of pit number one.

Do we have that last slide?

This is the Triassic map I had over there just a

moment ago. You can see by the contour a low spot here that lines up with the main trough in the pit areas themselves. A low spot here. There is just a bit of a low spot here. This contour bends around like this and the other side of the contour bends around like this. This is thirty-four fifty, thirty-four fifty and something on the order of thirty-four forty-eight right here in the middle.

So after finding these low places in the Triassic which was what this program was designed to do, we have proposed what we consider not only reasonably simple but very sound methods of blocking off essentially these low spots to make the pit areas themselves, to enable them to completely contain any brine that we may place in them.

Q. I'm not sure I've asked you, Mr. Reed, but please tell the Commission what is magic, so to speak, about the Triassic Redbed?

A. The primary importance of the Triassic from the standpoint of disposing of materials in or near the Triassic is really twofold. Number one, it does not transmit fluid very readily. It is composed almost entirely of clay-sized particles and the clay beds do not transmit water except in a very minor degree.

Q. Mr. Reed, do you know about how thick the Triassic is through this area of the Redbed material?

A. In this area it is somewhere between -- and it varies

of course, it is an erosional surface so that the thickness varies somewhere between six hundred and a thousand feet.

Q. And is that generally true over the entire area we are talking about?

A. In this area, yes.

Secondly, the importance of the Triassic is that in this area particularly, except in a few minor isolated cases, not similar to this particular area, the top of the Triassic represents the base of the fresh water.

Q. Are you telling us that there is no fresh water below the Triassic?

A. That is correct.

Q. Did you do studies to determine the permeability of this material that you are calling the Triassic Redbed?

A. I had a drill crew from Southwestern Laboratories in Arlington come to the area with the purpose in mind of drilling a number of holes in the bottom of these pits to indeed test their permeability or these clays' ability to transmit water.

Q. What did you find out?

A. Essentially what we did was to take this rig into the pits, drive three inch hollow tubes in the ground, recovered those tubes intact, extracted the material out of them, took these cores that we had collected, wrapped them in plastic and tinfoil to preserve them. They took them back to

the Arlington Laboratory and ran permeability tests on them, two kinds. They determined a coefficient of permeability for the undisturbed material. They determined a coefficient of permeability for the remolded samples. They took two sets of samples, broke them up, recompacted them and ran permeability tests on them.

Q. In general what were the results of these tests?

A. Generally without exception, with only two exceptions I should say, these permeabilities which can be considered in-place permeability, that is what you are going to expect out here in these pits, is less than five times ten to the minus seven centimeters per second.

Q. What does that mean in English?

A. And I'll say that I do mean less than, they get it down to ten to the minus ten centimeters per second. In English, five times ten to the minus seven means that with a foot of continual one foot of head throughout an entire year that the water would penetrate about five tenths of a foot into the bottom of the pit, into the sediments at the bottom of the pit.

Q. Was that the most permeable material or porous that you found in your testing?

A. There were two samples that were less than ten to the minus seven that were more permeable than ten to the minus seven. Both of these are in the upper portions or more

aptly described as the weathered part of the Triassic, it is an erosional surface and they had slightly higher permeability on the order of one times ten to the minus six which means again translated into English, about a foot of penetration per year, but those are only on the uppermost surfaces and are underlain by materials more impermeable.

The compacted samples, we ran them for the primary purpose of determining what would happen if we used this clay in the construction of any retention structures.

MR. ARNOLD: What are retention structures?

A. These are structures designed to retain or prohibit the movement of any fluids.

MR. ARNOLD: Dikes and core trench material?

A. Dikes and core trench material.

MR. ARNOLD: Thank you.

A. These two samples that we removed and ran permeability tests on were essentially one over ten less than in their recompacted state which is not an unusual situation so they will be, these materials in the core trenches and dikes will be as impermeable or perhaps more impermeable than the pit bottom itself.

Q. (Mr. Richards continuing.) Now, you were speaking of core trenches and dikes and a little earlier you told the Commission, I believe, that this was not a completely closed vessel that you found. Is this where core trenches and dikes

come into it?

A. That is correct. It is essentially enclosed except on its eastern and western ends but there are a couple of little low spots I would like to beef up to insure the integrity of the system.

Q. After you completed your permeability tests, Triassic elevations, surface elevations, did you come to the conclusion with certain modifications to the ends of this pit area that it had potential as an oil field production liquid disposal site?

A. That is correct, with a few modifications I think it should have very high integrity with that regard.

Q. Would you please tell the Commission in some detail the modifications which you feel are necessary and how you would propose that they be undertaken?

A. There are two kinds of modifications, there are those which I call core trenches which are in areas that pits do not now exist, in other words, these are outside the margins of the pits, then there are proposed structures that I call dikes which are simply mounded levees, if you will. Again, both of these are constructed of compacted Triassic Redbeds. To utilize the entire area of these pits there is a core trench that I would propose in the far western side. The best way to see it is right here, again you see a low spot in the Triassic and I tie this into the core trench to a known high verified by a drilled hole there. I would tie that side of the core trench to

a known high of the Triassic verified by a drill hole right there

Another structure down here just to the south of the main pits is another core trench to raise this slight depression here in the Triassic about three feet up to the level of this surrounding Triassic material.

This one is a combination core trench outside and a dike within for the primary reason to hold the level to contain materials within this major pit and not at this time let them go into this far eastern pit.

There is another structure which didn't come out on the slide at all but you can see on the map, is primarily a dike which cuts off this western part of the largest pit.

Both of these structures are designed to contain water as well or better than the materials that underlay the floor of the pits. The best way to do that is to find Triassic material to construct the structures. The core trenches could be constructed by means of removing what we know is permeable material on top. In other words, this just narrows out, the deep pit is here, what we saw before but this is up on the surface covered by sands and gravel. We dig down through what we know is permeable materials, sands and gravels, with a bulldozer, dig it well into the Triassic so we key this core trench to the Triassic, backfill the trench with compacted clay, very simply done by laying down six to eight inches of clay, adding moisture to it to aid the compaction and compacting

it with a sheeps foot or some device like that. You continue this process until the core trench is brought up to the desired elevation.

Q. And then do you have something similar to the recompacted samples you were telling the Commission about that Southwestern had run?

A. This is the reason for the recompacted samples, to test the integrity of the material that we are going to lay into these trenches. It looks very good.

The dikes are essentially the same kind of structure without being lain in a deep trench. They are levees that are laid down and clay six to eight inches thick compacted and brought up to the elevation that is desirable.

Q. Mr. Reed, after assuming that this diking was done and any boulders removed from the bottom of the pit, did you calculate for the Wallachs some potential storage or disposal quantitites?

A. I looked at evaporation data of the Red Bluff Dam to give me a good idea, I felt, of what the average evaporation should be. One can't dispose of all of the evaporation that these kind of numbers tell you that you can dispose of in one year because you have periods of low evaporation such as during the winter, so using the evaporation figures derived from Red Bluff, plus rainfall records, I came up with what I thought was a maximum amount of fluids that could be introduced

into these pits on a year around basis. In other words, the same amount per month per twelve-month period. Essentially it amounts to about four-tenths of a foot of water per month into each of the pits.

Q. Did you in using your evaporation datum use conservative figures from the Red Bluff area?

A. The evaporation datum themselves are averaged over about a fifteen year period.

Q. Now, are your results as to the calculations of the barrels per month of materials that can be disposed of in the site contained within your report?

A. Yes.

Q. Are they mathematically accurate?

A. Yes.

Q. And are they conservative in nature?

A. Yes.

I'll say very quickly that this amount that I have predicted you can dispose of in these trenches is such that there should be zero accumulation of water in the trench during a twelve month period so that we do not have an increase in the amount of accumulation of water in these ponds carried over from year to year. You have to be able to have enough storage to carry it through the low evaporation winter months and this is done with this rate of discharge.

Q. Mr. Reed, did you put any elevation limitations on

your recommendations as to the amount of water that could be disposed of in these pits?

A. Yes, I have. In each pit which I treat essentially separately in this report, I place an upper elevation which in my opinion right now we should not exceed this elevation with water.

Q. What is that?

A. It essentially represents an elevation which is four feet below the highest Triassic or the Triassic high around the pits. In other words, it's a four foot free board below what water should be below which level -- well, there's a better way to put it. If we think of the Triassic as a flat surface for just a minute, with a hole in the middle of it, this represents an elevation that is four feet below that level Triassic.

Q. All right. Are you aware of any statutory or regulatory designed criteria for this type of operation in the State of New Mexico?

A. There is a couple of criteria that the Texas Water Quality Board uses in similar kinds of instances. The first involves permeability.

Q. What is the Texas Water Quality Board's permeability standards?

A. They consider a pit to be impermeable with a permeability coefficient of one times ten to the minus seven.

Q. Is that what you found here?

A. We found permeabilities generally less than one times ten to the minus seven.

Q. Less permeability is better, is that right?

A. That's right.

Q. Okay, do they have any criteria for free board?

A. They generally recommend and in most cases require adherence to a three foot free board. I recommend a four foot free board because the system should be operated for a period of time, in my opinion, perhaps ultraconservatively to be a hundred percent sure of this integrity before we go even as high as the Water Quality Board recommends.

Q. I see. Now, do I understand that there are certain numbers of material that you say can be disposed of within this area with the trenching and boulder removal, the diking that you have described?

A. That's correct.

Q. All right, and are you of the opinion that this is a feasible project from a hydrologist's standpoint?

A. With the modifications that I recommend I think so, yes.

Q. Would you put any other safety features in your recommendation?

A. Absolutely.

Q. What are they?

A. Again to insure the integrity of this system and not

only that but to -- primarily to insure the integrity but if there was a problem to detect it early. A system of monitor wells or monitor holes, I should say. I have laid out in this area, again paying attention to low spots in the Triassic, where for some reason we did have a leak these wells would pick them up because they are in a low spot of the Triassic.

All of these which are double circles on the map, show up plainly on this map, represent holes that I would recommend drilling to detect escape from the pits. These holes are drilled five or so feet into the Triassic, they are cased with perforated PVC pipe and they are monitored regularly for the presence of water.

Q. In the unlikely event that water was ever present there, does your report contain certain criteria and recommendations for how that should be handled?

A. If we ever did find salt water in them, I say salt water on purpose, then there are very easy methods and I emphasize very quick methods to catch those leaks and it involves digging a narrow trench down into the Triassic once again and lining it with gravel and a perforated PVC pipe, collecting this water into what we call a French drain which is graded toward a centralized wet well. The water is then drained into the wet well and pumped out of the wet well back into the pit. So if you detect water when you monitor the wells

you immediately go down to the south, if it's in that direction, to the south of those monitored wells and construct this French drain which I will say again, it is a tried and true method, we have used it a number of times for all kinds of purposes really.

Q. Mr. Reed, what is the effect of dynamiting in the Triassic of the Redbed?

A. My opinion is that there would be very little damage to it. These clays are fairly plastic in nature.

Q. Are they at all like caliche?

A. Oh, no. Now, there is caliche. Some people think of caliche as being nice stuff on the roadbed and some of it is nice and dry up on the surface where an outcrop is, not like this dry stuff up on top. Caliche is a brittle substance most times and these clays are not brittle at all, they are very plastic.

Q. All right, based upon your investigation, your training and your background, do you have an opinion as to whether or not the operation of an oil field production liquid disposal facility in the southwest quarter of Section 29, Township 21 South, Range 38 East NMPM, also known as the Wallach gravel pit area, would or would not and according to the recommendations that you have put into your design parameters, would or would not create a hazard or contaminate any fresh waters in the area?

A. In my opinion it could be operated very safely and would not be a hazard to any ground or surface waters in the area.

MR. RICHARDS: Thank you. I pass the witness.

MR. RAMEY: Let's have a fifteen minute recess before we start on the cross examination.

(THEREUPON, the hearing was in recess.)

MR. RAMEY: The hearing will come to order.

Are there any questions of Mr. Reed? Mr. Ulvog?

CROSS EXAMINATION

BY MR. ULVOG:

Q. This depression or channel or syncline or low area, the general area in which these pits are located that you described, do you feel that this is a structural depression, a syncline or is it channeled out?

A. I don't think it's a syncline because, well, just for instance, in one of these pits, the first pit that I showed you, the easternmost side, you see green clays that appear to be truncated. I think it's erosional channels on the Triassic which is a very common -- the Triassic is a very hummocky channeled surface and I think this is what it is and it is also a very linear feature but not very big and not very wide so I think it's a channel and there is a little bit of

evidence in some places of little side channels, shallow side channels that come into it.

Q. Well, since you have several formations missing this makes sense. Now, the entire channeled out place is filled in with Ogallala, is that correct?

A. Yes, sir, basal Ogallala. There are a few Cretaceous boulders in the basal Ogallala as again you might suspect.

Q. Then these pits, they are all essentially in the Ogallala, is that correct?

A. No, sir, the material that was removed is Ogallala material.

Q. That's what I mean, what has been mined is Ogallala?

A. That is correct.

Q. And when the pit is mined out sometimes it reaches to the Triassic and maybe sometimes it doesn't, is that right?

A. In these pits that I've seen, almost without exception they are scoured down to -- the materials are removed down to the Triassic.

Q. But the sides of the pits then will still be Ogallala?

A. No, sir, but the nature of it being erosional, an erosional channel, you see, and I've got a slide that I'll show you, the sides of these pits are also Triassic. The V-shaped or U-shaped channel with Triassic coming up on both sides, the Ogallala fills on the outside and then drapes in into the inside of this channel but I do see, walking around

the edges of these pits Triassic up higher than the pit floor.

Let me show you this one slide right quick. Here is Triassic in the bottom. I drilled a hole right there, Triassic unweathered, essentially unweathered Triassic very close to the surface. I drilled another hole right here on this road, right in the road, again Triassic very close to the surface but a little bit of weathering on top as again you expect but that is several feet higher than that and this is reflected on my Triassic map and the same thing happened on the other side. Let's go back one more slide.

Here's the bottom of the pit, a bench three or so feet higher, Triassic material, on the rim here that you can't see in the foreground. The Triassic comes back up quite a bit higher than the bottom of the pit. There is a place that the Triassic is peeking through. This debris has essentially fallen over the edge of the pit.

Q. Now, if this is so then the dip of the formation then is -- this is a monolith dip dipping one direction in the Triassic do you think?

A. Generally in this area, right now there is a gentle dip on the Triassic, southward.

Q. Do you detect any bedding planes at all in the Triassic, any geologic changes or anything of that sort? You mentioned that you had seen where some of it was truncated and so on and so forth?

A. Yes, uh-huh, in this one bench is a suggestion of truncation. I can't swear to it because the exposures are fairly poor. In the drill holes it is extremely difficult to correlate beds because it is just all clays. There are one or two very thin sand sequences occuring on the top sometimes, six or eight inches, I think, but you don't seem to be able to correlate them across.

Q. If one of these pits had mined down into a silty or sandy member then of the Triassic this in effect would become a seep zone, would it not?

A. Well, yes, for the few centimeters or whatever it might be right there in that area. Like I say the pits themselves are underlain by Triassic materials. There is a thin erosional surface up on top as again you expect. In one or two instances I have seen in the deep pit on the far west there is a thin sand layer, so, yes, if you fill the pit up to the sand layer which is right at the top of the Triassic it would leak, yeah, perhaps. I don't know that for sure but I think it probably would but already you are in trouble because you are getting very close to the Ogallala Triassic inner face and we are recommending staying four feet down below the lowest part of the Triassic with our water. We are essentially containing these waters entirely within impermeable Traissic material.

Q. In the report I believe that I understood that your

monitor wells would go five feet into the Triassic, is that correct?

A. That is correct and the casing would then be set into that five foot zone and extend to the surface perforated from the bottom to the maximum elevation of a particular -- of the water that we would recommend in any particular pit.

Q. And all of these monitor wells will be outside of this area of the pits?

A. That is correct but quite close and most of these monitor wells are somewhat staggered, again as I say they are put -- and they are put behind the core trenches, for instance, to monitor the integrity of the core trenches and they are also put around the pits themselves to monitor the integrity, yes.

Q. So at least some of them, maybe none of them, would reach an equivalent stratigraphic point within the Triassic equal to the bottom of the pit?

A. No, they probably wouldn't reach levels of an equal stratigraphic layer.

Q. Probably none of them?

A. No, in most cases that's right, none of them will, that's correct, but in our core hole program it was the bottom of the pits that we tested and I put them on the map, I placed the location of these on the map prior to drilling the test holes so they are not placed where I saw a nice little piece of

good red clay sticking on the surface, well, we'll drill here, I put them on the map first and scattered them throughout the whole pit area. So the permeabilities in the table in my report represent the permeability of the bottom of that pit that's going to see the water.

Q. Could there be some impermeable members up on the walls somewhere?

A. I haven't seen them, but again they look similar to the clay that I see in the bottom of the trench.

Q. However, your slides show that there was a great deal of overburden that had fallen in over the walls of the pits and kind of obscured the Triassic as was apparent in some of your photographs?

A. Yes, particularly in the pit that I showed you, in the deep pit. You can see Triassic nearly all the way around except in the zones that I've -- again the westernmost side where there is a little swale, yes, and in those I see a little sand near the top but again good clay down underneath that zone.

MR. ULVOG: That's all I have.

CROSS EXAMINATION

BY MR. RAMEY:

Q. Let me dwell on these monitor wells, Mr. Reed, now, you state that the monitor wells will go five feet in the

Redbed, is that correct?

A. That is correct.

Q. Why wouldn't it be better to go ten feet or to some point lower, say, than the bottom of, say, pit one?

A. Primarily because the water if it escapes is not going to escape through the Triassic because and, again, I have drilled fairly deeply through these zones, through this Triassic, and a number of holes and it's comprised, except on the upper surface, of good clay so we don't anticipate leaks through the Triassic. If we have a problem the place that it's going to leak is at the inner face between the Ogallala and the Triassic, that's where it is going to escape.

There will be minor penetration of the water into the wall of the pits similar to what you will find at the bottom but as an avenue of escape the Triassic is not a candidate but that inner face is and, in fact, there are some pits lined with polyvonchloride in the State of Texas which I'm presently constructing closure plants for because that twenty ml PVC after a little bit of weathering leaks. These pits are constructed in the Ogallala, ten feet up off the Triassic, it leaks down through the PVC, hits the Triassic inner face and runs out and away from the site.

Q. So you are not at all concerned about any seepage occurring through the bottom of the pit?

A. No, neither through the bottom nor the sides.

Q. You feel like you have six to a thousand feet of protection?

A. That's correct.

Q. The only concern we should have would be leakage on the inner face of the Ogallala?

A. Yes, and the reason I say that is, the density of my drill holes here is pretty good but the Triassic is an erosional surface. Perhaps, and I think the possibility is remote because of the density of my points, but perhaps there is a little bit of a swale in the Triassic that I did not pick up in my drilling program, then this perhaps, if it was below the level of the water which again based on the density of the drill hole I don't think it's conceivable but if it happened, if it occurred, the water would run down through this little depression, this depression in the Triassic that will be filled with permeable sand and gravel and it is these areas that we would pick up in our monitoring program.

Q. How close to the pits do you recommend that these monitor wells be?

A. Well, I spaced them at various distances really, more based on what I knew of the Triassic surface. Most of them are less than a hundred and fifty feet from the edge of the pit. There are some that are within a hundred feet.

Q. How are these wells coded on your map, say on the Triassic map?

A. On figure four of my illustration in my report they are double circle wells. In the legend the double circle wells are the proposed monitor holes.

Q. So in essence, say you take pit one, you have your monitor wells everywhere but to the east of the pit, is that correct?

A. In pit number one?

Q. Yes.

A. Well, yeah, the number next to each monitor hole, that number represents the pit which that monitor hole will monitor. In other words, there is a monitor hole that I have located just east of the easternmost dike of pit one, labeled one-three. That will monitor pit one as well as pit three.

Q. Now, would it be necessary on pit one to have this dike to the south of the core trench, I think it utilizes that pit or --

A. I beg your pardon?

Q. Would you need the core trench to the south?

A. Should those two be connected, is that what you're saying?

Q. Just to utilize pit one, what construction work are you going to have to utilize to use pit one?

A. I see. If we just utilized pit one I would put -- I've got these labeled on one of these maps if I can find out which one. Oh, it's on the dikes and monitor holes. I would

put the one labeled C which is the easternmost dike, combination dike-core trench, I would put core trench labeled B and the dike labeled A.

Q. Now, what did you find the permeability of your samples that you took out of the pit area?

A. The permeability is -- many of them were less than ten to the minus seven centimeters per second. There were a couple that were -- one of them was one point four times ten to the minus six centimeters per second. The liquid limit of that sample, though, is very high, fifty. The liquid limit is a measure of how much water a sample will hold prior to flowing. That high liquid limit suggests there is something wrong with that test because it indicates very fine grained material so I suggest that was a poor and the lab technician also said that he thought there was something wrong with that particular one.

There is another one that was --

MR. RICHARDS: Mr. Chairman, that is contained in table seven in the report.

MR. RAMEY: Table seven?

MR. RICHARDS: Yes, it's immediatly --

THE WITNESS: It's page sixteen, fifteen and sixteen.

Q. (Mr. Ramey continuing.) In other words, the sample that is five times ten to the minus seven would be five times as impermeable as your one times ten to the minus seven?

A. More permeable.

Q. More permeable?

A. In other words, the permeability of one times ten to the minus seven essentially says that within one year with a foot of hydraulic head, the water will penetrate a tenth of a foot in that twelve-month period. Five times ten to the minus seventh means that it will penetrate zero point five feet in that one year with the same amount of head.

MR. RAMEY: Okay. Any other questions of the witness? Mr. Stamets?

CROSS EXAMINATION

BY MR. STAMETS:

Q. In response to Mr. Ulvog's question awhile ago you indicated that perhaps the Redbeds had a southward dip, is that correct?

A. That's right, in this immediate area.

Q. Is that a very steep dip or is it relatively flat?

A. No, it's fairly gentle, it's fairly gently. I don't have a real good handle on the amount of dip but I would say fifty feet per mile, sixty feet per mile perhaps.

Q. Quite gentle?

A. Yeah, quite gentle.

Q. Just in case there should be any leakage through the bottom of these pits, any vertical leakage, would the

likelihood be that it would leak down to some impermeable layer and then progress down dip towards the south?

A. Well, the bottom is impermeable and I guess I don't see how it could reach a more impermeable layer.

Q. Well, I just said "if", this is hypothetical.

A. Well, conceptually if we were putting this material in a pit with a high permeability such as the one I described a few minutes ago, that would happen, it would percolate down to an impermeable zone and migrate away from the site down dip.

Q. Okay, now, it's a very gentle dip, how about the thickness of the beds that you observed, were they fairly thick or fairly thin?

A. Some of the core holes that I drilled into the pit bottom I drilled, well, one that I remember, fifteen to eighteen feet through the bottom and it was continuous good, red clay down to the bottom of that.

Q. Without any break or any differentiation as to color or --

A. Well, sometimes there is a change in color. There are green chloritic clays.

Q. This would indicate some sort of a bedding or some sort of a change?

A. I think there is bedding there certainly so, but again the green chloritic clays are just as tight as the red

ones.

Q. Assuming now that the Commission wanted a test hole to be drilled, say to the depth of at least ten feet below any formations which would be in contact with the bottom of pit one, how deep would these test holes have to be drilled say on the south side of the pit?

A. Well, the bottom of pit one is at an elevation of in the neighborhood of thirty-four forty-five or forty-six. The rim on the south side of pit one is thirty-four sixty. We are talking about fifteen feet before you get to the elevation of the pit.

Q. So you would have a hole twenty-five feet deep?

A. If you went to ten feet below the bottom, yes.

Q. You might want to add a few feet because of this gentle dip then, twenty-five or thirty feet of depth?

A. I'm not understanding what you are saying.

Q. Well, because of this southward dip you might want to add a few feet to the twenty-five.

A. You are saying to get to the same stratigraphic horizon?

Q. No, to get ten feet below the same stratigraphic horizon.

A. Well, in order to get ten feet below the bottom of the pits, it wouldn't make any difference about the dip if you are trying to intercept the same stratigraphy that you see at

the bottom of the pit you would have to go a few feet deeper, five, ten, fifteen feet deeper.

MR. STAMETS: Okay, that's all the questions I have.

MR. RAMEY: Mr. Nutter?

CROSS EXAMINATION

BY MR. NUTTER:

Q. Mr. Reed, in estimating what your evaporation rates out of these pits would be, you have assumed that you would be able to keep the water completely free of any oil films, is that correct?

A. That's assumed in these calculations, that is correct.

Q. Now, --

A. These are Class A pan evaporation figures.

Q. Well, I notice on your table four you had used the net evaporation for Red Bluff which is in 1941, the low year as far as net evaporation was concerned?

A. That's right. That was a year of both high rainfall and low evaporation.

Q. Okay. And so in that year you had a total net evaporation of thirty-nine point six inches of water in table number three?

A. That is correct, that is with rainfall taken out.

Q. Now, looking at your evaporation rate then for the first twelve months exhibited there on table four and adding

those columns up I come up with three point three feet of water or thirty-nine point six inches and I find that you would be discharging, however, an estimated rate according to table five, of point four one feet of water per year. Now, why would you be discharging more than your evaporation rate would be?

A. You get that from doing what?

Q. Well, your table number three says that Red Bluff evaporated thirty-nine point six inches of water per year and then on table number four --

A. In a low evaporation period that is correct, that's an abnormal --

Q. That's a bad year. Don't you have to work on a bad year as far as making an estimate of what this pit can do?

A. Well, not if we have an emergency standby system and so what I have done, I have used the average, that average evaporation from Red Bluff and again you can't evaporate out, you can't add up twelve months and say you have sixty-five inches of net evaporation, you cannot put that much water in those pits because you have six months of low evaporation and you have too much accumulation so you have to tailor it throughout a twelve-month period, so I indicate that a maximum of this amount of water, four-tenths of a foot, can be discharged if we -- I believe I have a table in here also that shows what would happen, yes, table four, the fourth column under "Accumulation" shows that after what, a year and a half of poor

evaporation you would have an accumulation of two point two feet.

Q. All right.

A. After August.

Q. Now, you said these were pan rates but yet you have used Red Bluff Dam, are these evaporation rates out of the lake or are these panned over at Red Bluff?

A. No, these were panned at Red Lake. To continue, I have a suggestion in my report that we set aside one of these pits and in my mind that is pit number four, which is very deep and has lots of storage for emergency overflow, for when you have more accumulation than you can expect during average conditions.

Q. Now, have you taken into consideration the reduced rate of evaporation because of the salinity of the water?

A. We have not, these are calculations based on --

Q. On fresh water?

A. On fresh water, yes.

Q. Normally salt water doesn't evaporate as fast as fresh water?

A. Not quite, no.

MR. NUTTER: I believe that's all. Thank you.

MR. RAMEY: Any other questions, Mr. Houston?

CROSS EXAMINATION

BY MR. HOUSTON:

Q. Mr. Reed, in looking at these pits on the site the floor doesn't appear to be level and doesn't appear to me to have -- what did you say?

A. Fifty to sixty feet per mile.

Q. It doesn't appear to have any gentle slope to them at all, when you drive around on them you are climbing hills and valleys and dales.

A. In the pits you are talking about?

Q. Quite a bit in getting from pit to pit. There is one pit that is flat.

A. In the arroyo you have interrupted the regional dip by the arroyo.

Q. But the pits are not generally flat. There is one pit that is flat and the rest of them aren't, isn't that true?

A. Pit number one by and large for the most part is flat; pit number three by and large is flat.

Q. The rest of them are irregular?

A. In some form or another, yes.

Q. The walls of those pits are caliche and gravel, rock?

A. Above a certain point, yes, that's right.

Q. And it is your testimony that the Triassic Redbed is clearly evident all the way around the walls of the pit on

the level?

A. Well, if you will examine my Triassic map which is in the report that I believe you have a copy of you will see that --

Q. Which map are you referring to?

A. This is figure number two. Very simply what this map shows is that up to the north of the pits the Triassic is high, elevation thirty-four fifty-five. It shows that in the central part of this linear depression that the Triassic is low, thirty-four forty-three, forty-four and forty-five. It shows that in addition south of the pit the Triassic is again high. Now, this does not necessarily have any direct connection necessarily in terms of concern to what you see in the edges of the pits. It does not concern me the slightest amount that there are some edges of the pits that I can't see Triassic coming up well above the pit floor because I see it coming up higher than the pit floor, just outside that pit in my drill holes.

So to be walking those pits and to be totally surrounded by Triassic above your eye level is not a concern but you do have to make sure that the Triassic is higher than the bottom of your pits, on the outside of the pits and that is what I have shown here on this map.

Q. In other words, it can be irregular in the walls of the pit but you are confident that beyond the walls of the pit

that it is level?

A. That what is level?

Q. The Triassic.

A. It is not level, it is sloping up out of the pits. It's high on the south, it's high on the north and it's low inside.

Q. With no valleys in the edges?

A. As I pointed out before there is a slight swale down here to the south of pit one and the ends, the east and west ends are low spots.

Q. The east end flows into Monument Draw -- the west end flows into Monument Draw?

A. Let's look at my topographic map here. Just a minute.

Again, we are on this nose, if you are up on the surface we are strictly above the surface, the dip is in this direction, the surface. This lineation here, I have drilled across this road and I find a low spot in the Triassic, I do not know what direction that goes. I know it is a low and I'm going to put that core trench directly across that low, tie it into two known points that I've got.

Q. Where is Monument Draw in relation to that?

A. Monument Draw essentially is out here to the south, the southeast.

Q. Monument Draw actually is to the west, to the north-

west and then comes right down parallel to it, doesn't it?

A. Well, I would have to show you on a smaller scale topographic map which might simplify things.

This is the same scale map. Here is the nose and the surface is sloping out essentially this way and this way and this way.

Q. My question was, where is Monument Draw?

A. Well, Monument Draw is out here to the southwest, essentially. There is a small extension of it down around here to the west and to the south.

Q. Show us up in the upper northwest corner of that map where Monument Draw is?

A. Right here.

Q. And it comes right on down?

A. This is part of it, it comes down through here. You can see it better on some other maps of a little bit larger scale.

Q. You stated that the sand and gravel is in this trough and that you naturally expected it to be there?

A. Yes, sir.

Q. And is it found anywhere else in this area?

A. Oh, there is sand and gravel throughout the Ogallala in varying quality in terms of mining operations.

Q. You said that the Triassic Redbeds do not transmit water and they vary in thickness there from six hundred feet

to a thousand feet below this point?

A. That is correct.

Q. And that the top of the Triassic Redbed represents the base of the fresh water?

A. In most areas this is correct.

Q. In that area specifically. I'm talking about within a radius of some miles of that point, ten or twelve miles?

A. To my knowledge this is correct.

Q. Now then I didn't hear you say what the rainfall was at Red Bluff or the rainfall at Eunice, did you correlate that in your evaporation tables?

A. No, I didn't say and I'll have to look back through my report to answer that directly. I honestly don't remember whether I used Red Bluff or whether I used Eunice. I don't have the rainfall in my table and I honestly don't remember which I did. Normally anytime I can use local rainfall I do that.

Q. I believe the rainfall at Eunice would be substantially more, although it is low, than at Red Bluff.

A. I just don't recall. Like I say, normally when I can get local data, local rainfall data, I do so.

Q. Mr. Wallach referred to that pit to the north that his father excavated?

A. Yes.

Q. Where the cattails are growing now and that water stands in that pit, seeps into that pit, fresh water, did you observe that pit?

A. I saw it in the early stages of my investigation.

Q. Did you observe a water well at that pit?

A. I don't remember one, no, sir.

Q. Did you observe the cattails growing in that pit?

A. Yes, I did.

Q. Did you observe cattails and willows growing in the other pits that have water in them?

A. In this one deep pit it seems like there were some cattails, yeah.

Q. Did you observe the willow trees, weeping willows?

A. Well, I don't know what the trees were because it was wintertime when I did my investigation.

MR. HOUSTON: I believe that's all.

CROSS EXAMINATION

BY MR. RAMEY:

Q. Mr. Reed, just as a matter of curiousity how do you account for the salt cedars growing in, say in pit one?

A. I'm not aware that there are any in pit one, are there? The only logical way I can explain them in my mind is an accumulation by rainfall. The reason I say that is simply that I watched the drilling of every one of these test holes

and I also walked the rim of every one of these pits and I did not see in any of the test holes or in any of the rims of the pits, water flowing into the pits and the first time I went to the site was after a fairly good rain. So I can say, based on that evidence, in my opinion, there is no Ogallala water seeping into the pits. There obviously is rainfall that comes into that area and you can see large muddy areas and these waters don't go anywhere because it has got an impermeable bottom, they only are moved by evaporation so they are retained there, after a good rain they are retained there for a substantial length of time.

MR. RAMEY: Any other questions of the witness? Mr. Nutter?

CROSS EXAMINATION

BY MR. NUTTER:

Q. Well, do the salt cedars grow there without roots going down to look for water there? They are growing in the hard pan if they are growing in the Triassic, do they have roots?

A. I presume so, yes.

Q. What are their roots for, there is no water down there you say?

A. Well, I won't say that the Triassic is absolutely dry. You cannot produce a well out of it, out of the Triassic

Q. But you said that the permeability was something like five times ten to the minus centimeter per year or something, did you, Mr. Reed?

A. Yes, sir.

Q. I wouldn't think those salt cedars would need roots if there is no more permeability than that.

A. I don't have any idea what the salt cedars are doing.

MR. NUTTER: I believe that's all.

MR. RAMEY: Mr. Lucero?

CROSS EXAMINATION

BY MR. LUCERO:

Q. Did you say you walked the rim of all of these pits?

A. Yes, I have.

Q. How long ago was that?

A. Well, a number of times. The very first time I went out there which was, if my memory serves me right, last fall sometime, late last fall.

Q. And the latest time?

A. The latest time was -- it was early last fall, probably September, perhaps October -- the last time probably was in December.

Q. And you also walked the bottoms of the pits, you said?

A. Yes, sir.

Q. Did you walk the bottom and the rim of pit one or the pit that is supposed to have salt cedars in it?

A. I walked throughout most of the area visible on this map, portrayed on this map.

Q. Can you say now that you did or did not see salt cedars in the one pit that we are talking about now in all of those times that you walked the pits because I noticed that you looked over at one of the previous witnesses as to knowledge as to whether there were salt cedars or not in that pit. We are asking you of your own personal observation and knowledge.

A. I believe in pit one and also in pit four that there are some salt cedars.

Q. Are you making that from your own recollection, now, conclusions?

A. I believe so, as far as I can tell I am but it does seem like I remember seeing them in the bottom of the pit.

Q. Was there a great profusion of salt cedars in terms of numbers or just one or two or three?

A. My recollection is that they were fairly sparse.

Q. Well, are you sure or are you just saying that you think?

A. That is my recollection that they were -- to my knowledge I didn't ever have any trouble walking through any in that area and so --

Q. Well, of course, by walking through you mean that you weren't walking through a forest of salt cedars, is that what you mean?

A. Yes, sir.

Q. That's the difference between walking around two or three of them, is that it, we are talking about extremes. How many salt cedars do you think are growing in that area?

A. I'm afraid I wouldn't hazard a guess.

Q. Well, then there is some?

A. They were not dense.

Q. Then there is some doubt in your mind as to whether or not the amount of salt cedars that were there, there is some doubt in your mind now?

A. To the amount?

Q. Yes.

A. Well, to the specific density there is some question in my mind. When the question was initially raised I do remember at that time of seeing them in pit number four. I did not immediately remember seeing them in pit number one but again to the best of my knowledge I did see them in pit number one, not densely, but there were other things in there to my recollection, you know, it is bouldery for one thing and in places it is my recollection, it's not dense.

Q. But we are in agreement then that there were salt cedars but you are not sure as to the density, am I correct

in that conclusion?

A. No, sir, I'm not sure of their density at all.

Q. Another thing when you were looking at that figure one, the map, it shows the gravel pits and I presume that shows the surface configuration and elevations there?

A. That's correct.

Q. And I assume that the top of it is north, is that correct?

A. To my knowledge that is also correct.

Q. As you move away from the southern edge of the pits then and check the different elevations shown there, there is one that runs right to the south part of the pits or near there of thirty-four seventy-five. Then we move on to another dark one and you've got thirty-four fifty.

A. Yes, sir.

Q. And we are going further south and off to the right a little bit and you've got thirty-four twenty-nine and then you've got one real thick one there that is thirty-four twenty-five and so -- we are going south and when we get down to where I guess it says roadside park and all that we are near thirty-four hundred or thirty-three ninety-one. Does that indicate a slope of less elevations from the gravel pits going south?

A. Yes, the surface is sloping towards the south and the thirty-four hundred would be an elevation below the bottom

of the pits.

Q. Would that indicate that the Triassic formation that you say has low permeability follows that slope and to what degree if it goes south?

A. On a regional basis it does but again in the area of these pits there is a depression and that's the only reason that I proposed that we can use these pits is because of that depression. By and large I think that the Triassic reflects somewhat this dip, I don't know how closely.

Q. Then there is a downward slope going south of the Triassic too?

A. Well, I think I said the Triassic should slope downward to the south also.

Q. I had one other question. If you are going to place thousands of barrels of this salt water in these pits over here and then you have an indication in the monitor well that there is a leak, I don't think you explained to the Commission what remedial action you are going to take other than this emergency pit over here. What are you going to do to prevent this leak and once you have a leak, you have a leak, all you are doing there by the monitor well is determining that you have a leak.

A. The monitor well, like you say, is to determine a leak. If a leak is ever found a French drain down dip, down slope from that leak would be immediately constructed. It

involves about an eighteen inch wide trench dug down into the Triassic, a layer of gravel put on that surface, a four inch PVC casing laid on top of the gravel, more gravel put up on top of the PVC to bring it well up above the top of the Triassic and that drain then discharges into a wet well. The wet well in turn takes the water back into a pit. During the operation of the French drain, during the construction of the French drain, I should say, the leak itself, the configuration of the leak should be able to be determined and at that time remedial measures can be taken similar to the ones I have proposed for retention type structures.

Q. Suppose you have a manifestation of several leaks in several of the monitor wells on the south side of these pits and you intend to take remedial action and you take into consideration that you have this downward slope on the surface of this Triassic as you said to the south, what remedial action could you take if several of the monitor wells on the south side of this leak, you aren't going to trench up the whole south side of the valley, are you?

A. If we had leaks all the way along the south side?

Q. Yes.

A. Well, again --

Q. Taking into consideration that you have this slope, general regional slope going towards the south?

A. If I saw a leak all the way along the south side of

the pits which in my mind is inconceivable, then the French drain initially would be constructed all the way across that zone.

Q. But by that time you don't know how far it will have leaked?

A. Yes, we will because the monitor wells pick it up right away and in the first period of time I think two years if I remember my words, the monitor wells will be inspected on a fairly closely spaced, so, yes, you hit it the minute it hits one of those monitor wells and you dig your French drain and you have captured it right there.

Q. To the depth of the monitor well. The monitor well will only show what has happened to the depth that it has been drilled?

A. The monitor well will show if there is going to be a leak in the Triassic, in the whole system, it is going to be along that inner face and that's what your monitor well is going to determine. Our permeability tests show that that clay is well within what the Texas Water Quality Board, for instance, uses as a guideline to call the bottom of a pit impermeable.

MR. LUCERO: I don't have anything further.

MR. RAMEY: Mr. Stamets.

CROSS EXAMINATION

BY MR. STAMETS:

Q. Mr. Reed, I presume you are aware that the Commission

is responsible for protecting fresh water?

A. Yes, sir.

Q. From the potentially harmful effects of oil field brine?

A. Yes, sir.

Q. Now, in examining such an application as this is, is it unreasonable for a body so charged to look at such an application in a worst case basis or to consider the inconceivable?

A. No, I think it is legitimate to look at the worst cases.

Q. In this particular case would it be unreasonable to require that at least some of the monitor wells be drilled, say ten or twenty-five feet below the base of the pits?

A. I would not be opposed to that recommendation.

Q. Perhaps you don't know the answer to this question but maybe the original witness would.

Is all of the water which is going to go into these pits going to originate in New Mexico or would some of it come across the line from Texas?

A. I cannot answer that question.

MR. RICHARDS: Mr. Wallach.

MR. WALLACH: As far as we know it is all going to come out of New Mexico.

MR. RICHARDS: This witness wasn't sworn, would you

like to swear him, Mr. Ramey?

(THEREUPON, a discussion was held off the record.)

MR. STAMETS: That's all of the questions.

MR. RICHARDS: May I make a response for the applicant? They haven't solicited nor have they been solicited by any customers because, as you have noted, the uniqueness of the situation, they have contracted with no one to accept materials. I assume you are considering since they won't let us -- they want to steal our Ogallala in Texas anyway we shouldn't let them bring it back brack and I don't think that -- if that's a requirement or a recommendation they will abide by it. Obviously brine being produced in western Andrews County as well as central and southern Lea County fall into this category.

CROSS EXAMINATION

BY MR. RAMEY:

Q. Mr. Reed, along Mr. Stamets line of questioning, would it be possible, let's just suppose for a minute that the water did seep up from the bottom of the pit and maybe hit a silty zone in the Triassic maybe ten feet below in twenty years or something, would it be possible then that that water could migrate to the south or on the regional slope down this less permeable silty zone and then perhaps intersect another

channel of the Triassic and be at the base of the Ogallala?

A. Well, yes, if this permeable clay in the bottom of the pit was penetrated and it got into a silty zone it would naturally migrate down that silty zone, down dip, and that down dip is to my knowledge towards the south.

Secondarily, like you point out, that silty zone would again have to be breached for it to discharge back into the Ogallala.

Q. But this is a remote possibility and --

A. That's an extremely remote possibility and I just cannot myself conceive of it happening.

Q. But it would --

A. But that's the mechanics of what would occur, yes.

Q. It could be a basis for requiring deeper monitor wells?

A. Well, as I said, I would not be opposed to a few of these and I stress the word "few" because I've got a number of monitor wells located here but a few of them to be drilled down to say a little below the level of the ponds for two reasons, to watch this very thing, but perhaps as important as anything, to see what the lithology is down there.

MR. RAMEY: Thank you. Any more questions of the witness? He may be excused.

(THEREUPON, the witness was excused.)

MR. RICHARDS: The applicant is at rest.

MR. RAMEY: Do you tender those exhibits?

MR. RICHARDS: I move the introduction of Exhibit A to the application for all purposes.

MR. RAMEY: Exhibit A is the booklet, the yellow booklet?

MR. RICHARDS: Yes, sir.

(THEREUPON, Exhibit A was admitted into evidence.)

MR. RAMEY: Do you have anything further, Mr. Richards?

MR. RICHARDS: No, that is all of the exhibits and the applicant is at rest.

MR. RAMEY: Mr. Houston, would you like to take over?

MR. SIMS: I would like to call Mr. Sims.

R. D. SIMS

called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HOUSTON:

Q. State your name and address, please?

A. R. D. Sims, Eunice, New Mexico.

Q. And how long have you lived in Eunice, Mr. Sims?

A. I've lived there sixty-one years, around Eunice, I never lived right in town.

Q. Do you have a homestead near Eunice?
A. Yes, sir.
Q. How far from Eunice, Mr. Sims?
A. About seven miles.
Q. And how far is it from the gravel pits that are the subject matter of this hearing?
A. Probably straight across six or seven miles.
Q. So you have lived all of your life in that general area?
A. Yes, sir.
Q. Are you personally acquainted with these gravel pits?
A. Well, I've been to them several times.
Q. Have you observed anything about them that you think would be of material -- are you opposed to this application, first of all?
A. Yes, sir.
Q. Can you state in your own words generally why you are opposed to this application?
A. Well, the Redbed varies, for one reason, and another reason there are fresh water ponds that are there with willows and salt cedar growing out of there, they don't grow in brackish water.
Q. You feel that there is fresh water standing in these gravel pits, that they are in a fresh water bearing formation?

A. Yes, sir, I feel that it seeps in through the gravel.

Q. Now, you heard the testimony that one of those pits, the one to the west, was rainwater runoff from the rain two years ago?

A. Well, in my mind I wouldn't think so.

Q. Was there water there prior to those rains two years ago?

A. Yes, there was water there for several years.

Q. Do you know that of your own personal knowledge?

A. Yes, sir.

Q. Is that in periods of drought, we have had periods of drought, haven't we?

A. Yes, quite a few.

Q. Was that water there then?

A. Yes, sir.

Q. Now, you heard the testimony of Mr. Reed, did you not?

A. Yes, sir.

Q. You heard him testify that the Triassic Redbeds do not transmit water and it varies in thickness from six hundred feet to a thousand feet. Have you drilled wells in that area?

A. Yes, sir.

Q. Are those Redbeds that thick?

A. At different depths, they will run from shallow to deep and you run sometimes through a Redbed where it's not over

twenty feet through it.

Q. And then you go into other formations?

A. Yes, sir. A lot of times you will hit water right on that Redbed and sometimes you will go on down two or three hundred feet and hit water in the Redbed at different depths.

Q. Now, you heard Mr. Reed testify about his qualifications?

A. Yes, sir, I heard that.

Q. That he has worked on the astronaut programs and everything else?

A. That's not like experience.

Q. You are just a rancher down there?

A. Yes, sir.

Q. You don't belong to any societies or have any geological degrees, do you?

A. No.

Q. Do you know what you testified to to be a fact regardless of his theories?

A. Yes, sir.

Q. His theories are not true?

A. No, sir.

Q. You heard him say that the top of the Triassic represents the base of the fresh water?

A. Not always.

Q. And you just got through saying that sometimes right

under the Triassic Redbeds you find good fresh water?

A. Yes, sir.

MR. RICHARDS: I'm going to object to this witness until I can take him on voir dire as to his scientific qualifications as a geologist and this Commission reserve rulings until I have had a chance to cross examine him on his qualifications as to the admissiblity of his testimony.

MR. HOUSTON: If it please the Commission, I'm not asking him about his opinion, I'm asking him about facts. He is testifying as to what he personally has done and has observed.

MR. RICHARDS: If it please the Commission, what he is and what he is not, Triassic Redbed is a scientific fact.

MR. HOUSTON: If I may proceed until the Commission can make its ruling based on --

MR. RAMEY: Please proceed, Mr. Houston.

Q. (Mr. Houston continuing.) Have you observed in the area that there are varying formations there in these pits?

A. Well, I wouldn't say they are in the pits but I imagine they are because they are all around it.

Q. And that's been your opinion from your personal experience?

A. Yes, sir.

Q. Now, are you the head of the South Lea County Fee Land Association?

A. Yes, I'm President of it.

Q. And do most of the fee land owners in that region meet together to discuss common problems?

A. Yes, sir.

Q. Did you have a meeting of the fee land owners within the last few weeks concerning this application?

A. We had two.

Q. Did they instruct you to come here to protest this application?

MR. RICHARDS: Object, hearsay. Objection hearsay.

MR. HOUSTON: I didn't ask them what they said. I asked them --

MR. RICHARDS: May it please the Commission, Mr. Houston, let me finish my objection. The best evidence of what they did is a resolution or document from the body over the seal of the secretary of the body. Anything less is not evidence of what the corporate body did and I object to this witness attempting to testify. There is no evidence of authority, your honor.

MR. HOUSTON: I can clarify that, I think, if you will let me.

MR. RAMEY: All right, clarify it.

Q. (Mr. Houston continuing.) Mr. Sims, your organization is not a corporation, is it?

A. No, sir.

Q. It is an association of people who own land in that

region, isn't that true?

A. Yes, sir.

Q. And as such you have no corporate charter, corporate seal or anything else?

A. No.

Q. And you are not representing that you do have a corporation?

A. No.

MR. RICHARDS: Then I'm going to further object. If they have no standing as an organization and no bylaws, it is not an organization for which he can speak or testify and his testimony stands on that alone and, again, depriving me of the right of cross examining this amorphous group of people who may have met together, if they have any bylaws they will set out the rights of the president and/or authority of the president and we have no evidence of that.

MR. RAMEY: Could you bring this out on cross examination, Mr. Richards?

MR. RICHARDS: I will, sir, I object to the testimony at this point, it is just not admissible.

MR. RAMEY: We will admit the testimony and consider it for what it's worth.

Q. (Mr. Houston continuing.) Mr. Sims, in connection with your drilling water wells in that region over many years, have you encountered this Redbed clay?

A. Yes, sir.

Q. All right, in that Redbed clay, have you found it to be a solid, that is, not permeable but with no gravel or imperfections in it or what have you found in that?

A. Well, sir, you will find different types of clay in it and and you will find gravel streaks and sand in it. It won't all be the same.

Q. Have you drilled wells and found that they are generally good or have you had sporadic results six miles away from these gravel pits, for example, where you live and in the area?

A. Well, we've got Redbed wells in the area I live in.

Q. Do you have good wells that are drilled to the same depth very nearby?

A. Yes, sir.

Q. How do you account for that?

A. We haven't figured it out yet.

Q. In other words, there is a water pay that may be very close and you may miss it in one well but hit it in another one?

A. That's right. The well that Stevens has right north there, they drilled twelve to fifteen feet from that well and didn't get any water at all and they've got a good vein of water where the well is. It's right to the north of those gravel pits.

Q. How far to the north would you say?

A. Probably three-quarters of a mile.

Q. Now, you heard testimony about that pit to the north that Mr. Wallach dug, that has water standing in it, fresh water and cattails?

A. Yes, sir.

Q. How far is it from the pits, do you know?

A. You mean the well?

Q. Well, I'm talking about -- you said the Stevens well was three-quarters of a mile. I understood that that cattail pit was three-quarters of a mile from the pits that we are talking about here.

A. Well, I don't think it's that far. It could be, but I don't think it is.

Q. Do you have an opinion of how far it is?

A. No, sir, I don't. I haven't been up there to that north pit.

Q. Are you acquainted with the old Baker springs?

A. Yes, sir.

Q. Do you remember that as being a good water well or what is it?

A. Well, it's just like these up here, it's a seep. It makes more in wet weather than it does in dry weather but it always watered the cattle that are on that place there before it went dry.

Q. Has it gone dry since these gravel pits have been dug?

A. Yes, sir.

Q. Do you have anything else to add that I haven't brought out?

A. I don't believe so.

MR. HOUSTON: I believe that's all.

MR. RAMEY: Are there any questions of the witness? Mr. Richards?

CROSS EXAMINATION

BY MR. RICHARDS:

Q. Is the South Lea County Land Owners Association a corporation organized not for profit or a non-profit organization, chartered by the New Mexico State Corporation Commission?

A. I don't think so.

Q. Does it have any bylaws?

A. Yes, sir.

Q. Does it provide for a secretary recording official actions of the association?

A. Yes, sir.

Q. Do you have with you any official document by the custodian of the records of the corporation, who I assume is the secretary, of any action or activity by the association regarding this hearing today?

A. I didn't bring them.

Q. Do any, in fact, exist?

A. Yes, sir.

MR. RICHARDS: I move to exclude that portion of the testimony where he purports to speak for anyone but himself as not being the best evidence of the action of the association or the president, Mr. Chairman.

(THEREUPON, a discussion was held off the record.

MR. RAMEY: We are going to overrule your objection, Mr. Richards. Do you have anymore questions of Mr. Sims?

MR. RICHARDS: Yes, sir.

MR. RAMEY: You may proceed.

Q. (Mr. Richards continuing.) I did understand, Mr. Sims, you told this Commission that you had no training in geology or hydrology?

A. No, sir.

Q. Now, you say in drilling water wells down there you have struck some red material, is that right?

A. Right.

Q. And below that red material you got some water?

A. Yes, sir, we did.

Q. Have you ever heard of red Ogallala?

A. I don't know Ogallala or whatever it is.

Q. You don't know then what the red material really was,

do you, Mr. Sims?

A. Yes, I know what red clay is.

Q. Do you know what red Ogallala is?

A. I suppose it's a red clay.

Q. The red Ogallala that you struck then could well be the red clay that you are talking about, is that right?

A. It's red clay, yes.

Q. You don't know, do you, when you can't tell this Commission that as a matter of fact that the red Ogallala which you struck in drilling water wells is the same as the Triassic Redbed which Mr. Reed was testifying about?

A. It's all the same thing.

Q. Tell me, what training and experience are you basing this knowledge on, Mr. Sims?

A. Experience.

Q. Just experience?

A. Yes, sir.

Q. And you are a geologist by experience, is that right?

A. I didn't say that.

Q. Okay, sir. You did tell the Commission that the water is spotty in this area?

A. Yes, it sure is.

Q. Did you hear Mr. Reed's testimony about the nature of the Ogallala water as it relates to the topographic map,

figure one behind you?

A. I heard Mr. Reed's testimony, yes, sir.

Q. Do you understand that that is generally true in your experience in the area that the Ogallala fingers out and then begins to develop to the north and east of this area?

A. I didn't say that.

Q. Well, isn't that correct?

A. I don't know what your term of Ogallala is but that Redbed, it varies in that part of the country --

Q. But, Mr. Sims, my question was --

MR. HOUSTON: If it please the Commission, I would like you to instruct counsel to permit the witness to answer his question and not interrupt him. He has a right to answer the question.

MR. RICHARDS: I would be glad to have him answer the question if he can answer the question. Go ahead, Mr. Sims.

A. I can answer it in my cowboy fashion but I don't know it in an educated way but we do have the Redbed and it varies in depth and sometimes it will come up to the top of the ground and other times it will be deeper and sometimes you will go through it and it will be shallow in places and deep in places and a lot of the time you will hit water under it and a lot of the time you won't.

Q. (Mr. Richards continuing.) Now, that is whatever this red is, whether it is red Ogallala or Triassic Redbeds, is

that right?

A. Yes, sir.

Q. Okay, just tell the Commission if the water, the surface water, gets stronger and more prevalent as you go in this direction from the pits, if you know generally?

A. It will get stronger west and south but it is weaker east and southeast but the water travels to the southeast mostly, it travels to the southeast in that part of the country.

Q. Now, where in relation to these pits are you?

A. Southwest.

Q. Southwest, across the so-called Monument Draw?

A. Part of my place is in the Draw. I am in the Draw and on the west side of the Draw.

Q. Do you have any interest in as an investment or as an operator of a facility for the disposal of oil field brine?

A. I don't have any interest in it. There is a disposal well on my place but I don't have no interest in it.

Q. Who owns that disposal well?

A. Agua.

Q. Do you receive any benefits for the operation of this well?

A. I receive a lease on the surface.

Q. You don't personally own an interest in any disposal facility?

A. No, sir, no way.

Q. Are you in partnership with any members of your family in the ranching business?

A. Yes, sir.

Q. Are you in partnership with Pat Sims?

A. No.

MR. RICHARDS: Nothing further.

MR. RAMEY: Mr. Sims, did all of the members of your association support your coming up here or was it a split vote?

MR. SIMS: I think there were two votes against it, two that didn't vote, I'll put it that way.

MR. RAMEY: Thank you. Mr. Stamets.

CROSS EXAMINATION

BY MR. STAMETS:

Q. Mr. Sims, have you drilled any wells near these pits?

A. I haven't but my uncle had a ranch just across the line that runs right up to this and I worked for him a lot and he drilled a lot of wells over in there. I don't know how many he did drill but he got very few with water. Ed Tinzel owns the ranch now. They've got the land that the old Baker Springs is on.

Q. Did you actually particpate in the drilling of any of these wells?

A. I was with him on several wells, yes, sir.

Q. How close to the pits?

A. Well, I imagine a mile is the closest well.

Q. A mile southwest?

A. South and east.

Q. A mile to the south and east?

A. Yes, sir.

Q. How deep was that well?

A. Well, they drilled them all different depths to try to get water.

Q. Well, this one particular well to the south and east, do you recall specifically?

A. Well, they just drilled to the Redbed on it and I think to the best of my knowledge, it has been several years, and to the best of my knowledge it was around sixty feet.

Q. So you haven't drilled any wells deeply into the Redbeds in the immediate vicinity?

A. Not right in the immediate vicinity, no.

MR. STAMETS: Okay, thank you.

MR. RAMEY: Mr. Houston?

MR. HOUSTON: I have no further questions.

MR. RAMEY: Any other questions of the witness?

MR. CLEMENTS: I've got one.

MR. RAMEY: Mr. Clements.

MR. CLEMENTS: Are there any precautions that you feel

like would make this usable, do you have any precautions that you find acceptable on this sort of thing?

MR. SIMS: What, to store water in there?

MR. CLEMENTS: Right.

MR. SIMS: I don't think it's a perfect seal in that formation because on my knowledge and experience the clay is not all, you know, there will be cracks and things in it and I don't think they would find one of them with the wells that they've got around here. I think you would have to have a solid trench around it and then another thing, as heavy as those pits have been shot at times they could have holes going down into some of these little veins that go through that Redbed where there is gravel and sand and different kinds of formations.

MR. HOUSTON: Let me ask you in that connection, have you heard the shots?

MR. SIMS: Yes, sir, they shook the windows?

MR. HOUSTON: Six miles away? You felt the ground vibrate six miles from there?

MR. SIMS: Yes, sir.

MR. RAMEY: Are there any other questions of the witness? Mr. Lucero?

CROSS EXAMINATION

BY MR. LUCERO:

Q. You mentioned that Baker Springs had gone dry?

A. Yes, sir.

Q. How far is this natural spring from water?

A. When these gravel pits first got started they started down where they call this Baker Springs and they dug down into this water. This Baker Springs started, Shorty Berry was the first man who started a gravel pit over in that area.

Q. Well, how far is this Baker Springs from the present gravel pits?

A. It's probably half a mile or three-quarters maybe, in that vicinity.

Q. When did it dry up, if you can recall?

A. Well, it has been dried up for five or six years, four or five years, or somewhere in that neighborhood. They haven't used it, they finally piped water from the ranch over to the springs, it's on this side of the line.

MR. HOUSTON: Was there a big watering just north of this back years ago that produced a lot of water?

A. It was northeast of these pits.

MR. HOUSTON: Whereabouts was it?

A. Well, it's about a mile east of the stateline.

MR. HOUSTON: In Texas?

A. Yes, sir.

MR. HOUSTON: What is the name of that watering?

A. They called it the Scratch water, it was the old Scratch headquarters.

MR. HOUSTON: How big a well was it?

A. It had a four-inch pump in it and it would throw a stream of water almost full with a windmill and it watered several hundred cattle and now it is plumb dry. It went dry about four years ago. The cattle that used to water there, it was the only water for about twelve miles at one time.

MR. RAMEY: Mr. Richards, do you have a question?

MR. RICHARDS: Let me ask just two, please, Mr. Chairman.

RECROSS EXAMINATION

BY MR. RICHARDS:

Q. Mr. Sims, you are aware that the Ogallala is declining, the water levels are declining due to pumping aren't you?

A. All of the water is declining.

Q. Due to pumping?

A. I don't know that it's due to pumping.

Q. When do you recall that your windows were shaken?

A. They shook several times from these shots. I haven't gotten any in the last year or two but back before then there was --

Q. Twenty years ago?

A. Oh, no, back three or four years back.

Q. You are sure they weren't sonic booms?

A. You could see the dirt go up in the air three hundred feet.

Q. Fine, I appreciate that. Do you know anything about the Rustler limestones?

A. No, sir.

MR. RICHARDS: Okay, thank you, that's all.

MR. RAMEY: Mr. Ulvog?

CROSS EXAMINATION

BY MR. ULVOG:

Q. I had one question. Do you remember when you had been working on these water wells, when you drilled water wells and so on, what the greatest thickness of this red material, Redbed, red clay or whatever, do you remember the most thickness of that that you penetrated?

A. No, not too many of them go through the Redbed, most of them will quit when they get down to the Redbed but in certain places they have to go through the Redbed to get any water to amount to anything.

Q. When you did that how much Redbed did you go through before you quit?

A. Well, it was different depths, it would run from a hundred and fifty feet on down to five or six hundred feet.

Q. So how much of the red material would you have cut in any one well, if you can remember, the most you have ever

cut through?

A. Well, I never did help drill any of the deep wells.

Q. I see, so you don't have any knowledge then of the most of that that has ever been penetrated?

A. No, sir.

MR. ULVOG: Thank you.

MR. RAMEY: Any other questions?

MR. HOUSTON: No, sir.

MR. RAMEY: The witness may be excused. You may call your next witness.

MR. HOUSTON: Mr. Fred Boyd.

FRED BOYD

called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HOUSTON:

A. Fred Boyd, Box 822, Eunice, New Mexico.

Q. What is your occupation, Mr. Boyd?

A. Oh, I have a place out there and raise cows and I work for McCasland, drive trucks for him.

Q. Drive water trucks?

A. Yes, sir.

Q. You haul salt water and brine from wells as well as

fresh water and brine water?

A. Yes, I do and I own a percentage in the brine water wells.

Q. In the disposal wells?

A. Yes.

Q. Where is your place in relation to the gravel pits that are the subject matter here?

A. Well, two miles off to the west, right down in the Monument Draw and then four miles to the south, about a mile north of R. D.'s house.

Q. How long has your family owned those properties?

A. They homesteaded there.

Q. So you are a homestead family in that area?

A. Yes.

Q. Are you acquainted with the gravel pits?

A. Yes, I have worked out there with them.

Q. When did you work out there?

A. I worked for Paul and Bob's daddy out there.

Q. You worked there before they got to be grown, is that right?

A. Yes, that's right.

Q. What kind of work did you do?

A. Anything there was to do from running the plant to doing dynamiting to hammering rocks with a sledge hammer so they would go in the crusher or drive trucks or anything that

there was to do.

Q. You heard Mr. Sims' testimony that large shots of explosives were set off?

A. Yes, sir.

Q. Did you set off some of the dynamite when you worked there?

A. Yes.

Q. What is the largest shot you ever set off in these gravel pits?

A. The largest shot I ever shot was six tons at one time.

Q. In these pits?

A. Uh-huh, and that was at the east side of what I think they are calling Pit Number One, I don't know, if pit number one is the first one south of the office, when they started expanding it back, back to the east, that's when I shot that one shot, of course, I shot all around that country over there for them but that's the biggest one I shot.

Q. What were the other shots?

A. On down to one to two sticks.

Q. Were there any as much as a ton?

A. No, I doubt if any of them went up to as much as a ton at one time but that one was at six tons I know because I had to wait several hours after I got the holes dug for the truck to come and bring them and we dumped them right off the

truck and into the holes.

Q. Now, were you there when the pits were dug into fresh water?

A. I was.

Q. Describe that for the Commission?

A. When it was dug down to them, of course -- of course, they can't produce any pit, you don't load the screens with anything that is wet. You dig down to it and when it gets too wet you quit and then the next morning the water would be seeped up enough, you know, that you could get a drink or something like that.

Q. Was it drinking water, drinking water quality?

A. Yes, I've carried water home from there to cook beans in, it's good soft drinking water.

Q. Okay.

A. I took the water home to cook beans in.

Q. You heard Mr. Wallach testify that his father planted bass there prior to his retirement in '62?

A. Yes.

Q. Did you ever fish out there?

A. I never did but I've looked in and seen the fish and I've watched other people fishing but I never fished.

Q. Commissioner Lucero asked a question about the green in some of the colored slides that were shown here today, about what vegetation was growing in those pictures. What vegetation

grows in those pits?

MR. RICHARDS: Pardon me, I want to object to the form of the question, Mr. Chairman, Commissioner Lucero was describing an area outside of the pits and without relation then he later asked about something that is not even shown in the photograph, was there salt cedars in the pits. I think it's a duplicitous question.

MR. LUCERO: Excuse me and I'll explain my second question. There was some green in one of those pits over there that I asked about. The first one was as to the general area and then the second one was to some green that appeared in them.

Q. (Mr. Houston continuing.) What is the vegetation in the general area?

A. In the pits or outside of the pits?

Q. Outside the pits?

A. Well, mesquite and I think there is some sagebrush and grass.

Q. All right, what's the vegetation in the pit?

A. The vegetation in the pit, now, the long, steeper one over to the left, the second one, the long deeper one, there are salt cedars growing up to a certain point and right down to that point it has -- I mean, growing down to a certain point and inside that water up to a certain point is cattails.

Q. Now, this is not the north pit, what has been called

the cattail pit?

A. No, this is south of the office, this big, long one here and in years back I helped personally set a water pump down in that to pump some water to the thing?

Q. How long ago?

A. Oh, I would say in the early fifties.

Q. In the early 1950's?

A. Yes, and there wasn't enough water there, you know, to really supply anything at all but we would run the water pump from time to time to, you know, pump water in the pit to wash the gravel with but it wasn't a big water supply at all.

Q. Do you have an opinion as to whether or not these pits are suitable for salt water disposal?

A. Well, I'm not here to defend my interest in mine because we truck our own water and I feel that they would get very little business from us whatsoever, if it does I got a living made, I never had it, but in my own mind I doubt it is and, you know, I don't have anything to base it on whatsoever except to say that the water does come to a certain level and that the cattails grow up to a certain level and the salt cedars grow down to a certain level and that indicates to me that there is a definite water level there.

Q. There is live water in those pits is what you're saying?

A. Yes, I think so.

Q. Do you have anything else you would like to add that I haven't asked you about?

A. Well, just like he was saying there awhile ago, all of the pits that I worked in which I quit in 1957 and all of the pits that we dug, you know, that the Redbeds channeled off to the west towards Monument Draw, just like he was showing awhile ago, anything that we worked in up there and, of course, the whole business on it is up on the hill, you know, and off to the west is off the hill and off to the south and the west is off the hill which would indicate that there would be a drainage towards Monument Draw and in an old pit that they had down towards -- by their other water stations down in Monument Draw, he produced it awhile but they couldn't sell the sand out of it because it wasn't suitable to the people. There is a sand strata about six foot in the ground which varies and my daddy dug many holes into it to plant fruit trees through a soft caliche that's there and he dug it down into that sand strata which, you know, for the trees to root and if the water ever got to that then it is definite that it would run.

Q. If this brine water ever got to this sand strata it would contaminate your --

A. It would follow the Redbed on bottom, you know, and it doesn't just go down to our house it goes up north too because I've hauled lots of it out of caliche pits on Eubank's

place up further in the draw.

Q. Are you familiar with Baker Spring?

A. Yes, I've been there a few times. It has been just years and years and years since I have been there, but I have been there a few times.

Q. Do you know anything about when it went dry, what Mr. Sims was testifying about?

A. I didn't know it went dry until I heard some of them talking because I haven't been in there since Monroe Baker died. Whenever he was there I would occasionally visit him and I have been up there two or three different times to his place.

MR. HOUSTON: That's all the questions I have.

MR. RAMEY: Any questions of the witness?

MR. RICHARDS: Please, Mr. Chairman.

CROSS EXAMINATION

BY MR. RICHARDS:

Q. This fruit tree planting is miles away from this, isn't it?

A. You're right, possibly straight through it's at least five or six miles that way.

Q. You don't have any idea what the Redbed configuration is between the two areas, do you?

A. The only thing I know is that the further away it

gets the deeper it gets, I mean, down into the Draw there it gets deeper.

Q. You say you saw your daddy dig through some soft caliche and found sand under it?

A. That's right.

Q. You're not trying to tell this Commission that soft caliche and Triassic Redbeds are the same thing, are you?

A. No, I'm just trying to say if the water gets to that string of sand which I know is as close as two miles to it then it is going to travel in all of the wells that are drilled and not cased, you know, in that country, it will just trickle right off into them.

Q. You say you own a disposal well?

A. I own a half interest.

Q. Where is it?

A. Twelve miles northwest of Eunice, straight west of Eunice.

Q. Do you pump it under pressure?

A. It all goes on gravity.

Q. Do you have any test holes around it?

A. I don't have any test holes around it.

Q. Do you ever check down there to see what shape that casing is in?

A. I sure do.

Q. How?

A. I have a continuous check on it.

Q. Well, good, tell me how?

A. The casing is set and full of treated water and we have gauges on the top of it to meet the State requirements.

Q. Good, but you don't have any test holes around it to see if it is leaking out of the Redbed, do you?

A. I sure don't.

Q. How deep is that well?

A. We do know that it is traveling down in the oil pay. It's thirty-eight hundred.

Q. Good. When did you set off six tons out there?

A. About '55.

Q. All right.

A. I quit out there in '57, it was just awhile before that.

MR. RICHARDS: I believe that's all.

MR. RAMEY: Any other questions of the witness? Mr. Stamets?

CROSS EXAMINATION

BY MR. STAMETS:

Q. Mr. Boyd, Mr. Reed testified that the gravel pits are kind of in a bowl-shaped area in the Redbeds and that this bowl although it's not complete would contain some water. Do you suppose that is why that water was in there when they were

mining this gravel out, that it collected in there over a period of time and when you mined the gravel out you just got down to the water that was sitting there on top of the Redbeds, kind of like dipping sand out of a bathtub, take out the bottom inch?

A. You're right but the only thing that I see against that is that the standing water in the pit they are talking about putting the water in, if it's the one I'm thinking about, it holds its own level until the trees grow to it and the cattails grow up out of it, you know.

Q. There are a number of pits down there and the one -- are you thinking of the pit that is closest to the little black-topped road?

A. That's right.

Q. That's not what they are calling their pit number one, if I understand it right. That pit number one is that long pit east of this deep pit.

A. The one I'm speaking of is the first one south of the office beside the black-topped road.

MR. STAMETS: That's all the questions I have.

MR. RAMEY: Any other questions of the witness? He may be excused.

(THEREUPON, the witness was excused.)

MR. HOUSTON: Tom Linebery.

TOM LINEBERY

called as a witness, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. HOUSTON:

Q. Your name is Tom Linebery and you live twelve miles west of Kermit?

A. That's right.

Q. Do you have a ranch known as the Speed Ranch which is in the vicinity of Mr. Sims' and Mr. Boyd's property?

A. Mr. Sims and Mr. Boyd join me on my extreme west.

Q. How close does your property lie to these gravel pits?

A. Oh, five or six miles. I have several miles of Monument Draw that goes through my ranch.

Q. Monument Draw runs through your Speed Ranch that joins Mr. Sims?

A. Yes.

Q. Does Monument Draw run through your ranch headquarters down by Wink?

A. Right.

Q. It's the same draw --

A. The same draw.

Q. That these gravel pits lie on the east side of?

A. East side of.

Q. You have heard the testimony of all of the witnesses here today, haven't you?

A. Yes, sir.

Q. Have you inspected those gravel pits?

A. Less than a week ago.

Q. On more than one occasion?

A. I have been there before.

Q. And did you go there during the past week, did you go there on two occasions?

A. One.

Q. On one occasion?

A. Right.

Q. All right, what did you observe?

A. I saw four pits with water in them that I considered fresh water, it was clear water. It was obvious it wasn't rainwater, it wasn't stagnant. One pit was a little murky, three of them was clear as a crystal. I would have been glad to have a drink of it but if I could have reached it. All of the pits had some salt cedars. One or two of them, two of them I believe, had a willow tree or two growing in it and cattails and it was obvious that the water level in all of the pits was constant, so that indicated there was a steady feed into those pits to me.

Q. Now, you know the great, big pit that they refer to as their pit number one?

A. The big, flat-bottomed one we had out there with the wagon drill in it?

Q. Yes.

A. Yes.

Q. All right, there was debris where there was not activity in various points there?

A. Yes.

Q. Your testimony is that there are salt cedars in all of the pits and on the edges of the pits and around the debris, is that true?

A. No just salt cedars where the water was. I didn't see salt cedars growing up there in what they call the spoils.

Q. But that did indicate to you that there is water there?

A. I saw the water.

Q. Did you observe the red clays in profusion or in limited amounts?

A. Well, I was looking for red clay but frankly I saw very little in the banks of those pits that I considered red clay. I saw a sign of some red clay in one of the pits, the big pit. It didn't look like it was good quality clay but it had a pinkish color. I assume maybe there was some clay there but you look straight up and down the banks and I didn't see anything that I would call clay or Redbed or Triassic or whatever you want to call it because I couldn't see how that could be clay part way up the bank and had mined sand and gravel

out of it right down to the bottom. I didn't think it quit altogether right there on the edge.

Q. Now, were those pits generally irregular in the bottoms or are they flat bottoms in general?

A. One pit had a fairly flat bottom but take it as a whole they were as irregular as you could get anything.

Q. Now, you heard me ask Mr. Reed about the pit that has the water standing in it that was excavated by Mr. Wallach, Senior and he found water in it or found water but it was just a seepy water. You heard me ask if he observed a well there. He said that he did not recall one. Did you hear me ask him that?

A. Yes.

Q. Is there a well there?

A. Yeah, we got out and looked at it and it's cased with it looked like ten-inch casing, eight or ten. It was an open well, the casing was sticking up above ground level, I guess, and there was an old pump jack there, the base of a pump jack, it looked like it had had a pump jack on it. We looked down this well, we could see the water down there. The well was probably as close to that pit that had the water in it as from me to the end of the table but the water level in this cased well was lower than the level in the pit right by it.

Q. There is no runoff from rainwater in that pit, is there?

A. There is no runoff in that pit and no runoff in that well.

Q. And both of them had water in them, fresh water, but at different levels?

A. Yes.

Q. Did you observe cattails in some of those ponds did you say?

A. Yes.

Q. Weeping willow trees?

A. Weeping willow and salt cedar only where there was what I considered live water did I see such.

Q. Now then, have you drilled wells in that area and observed other people drilling wells?

A. I drilled a lot of wells just to the southeast of there which would be the east side of Monument Draw and we have used all of that country east of there through the Texas side through the years to run cattle on. I never drilled any water well directly east of these pits but I have probably drilled more deep wells deep into the Redbed than anybody down there.

Q. All right, the question was asked awhile ago, how deep the Redbed is or how thick the section is, have you drilled through the Redbed anywhere?

A. I never got through the Redbed but I have drilled and got water in the Redbed at about three hundred, three fifty or

four fifty and seven fifty.

Q. In the Redbed?

A. In the Redbed and when you get this water it is a very thin vein of water, they are weak wells, they just barely water cattle and when you go through that little vein you go right back in the Redbed. I never did get completely through the Redbed so I can't tell you -- the deepest well I ever drilled was around eight hundred feet and I was still in the Redbed so I don't know where it is.

Q. You heard Mr. Reed testify that the top of the Triassic Redbed represents the base of fresh water?

A. I heard that but it is sure not true when you get east of Monument Draw. That Redbed over there too is very fractured. You will drill good solid Redbed awhile and then you go into a strip of yellow sand or light colored sand, it looks like a silt. You quit in the evening and maybe you got two hundred feet of hole and you come back the next morning and you haven't got but a seventy-five feet hole. It's very fractured, I guess, porous. It will cave in on you awful bad. I have had to get a well there say two, two fifty and had to case it before I could get any deeper on account of the cave-in problem. It indicates to me that that Redbed is very fractured. I know it is fractured with different formations of sand and silt and occasionally you see a speck of gravel.

Q. I gather then that you would disagree with Mr. Reed's

conclusion that if water escapes it will not leak through the Triassic Redbed?

A. If it escaped it could go a lot of places over there from my experience in drilling.

Q. Even when you don't make a well does it usually have a seep in it?

A. Well, drilling over there in that Redbed there is no such thing as you might say a dry hole. You may not get enough water to pay you to put up a windmill but I never drilled a dry hole. You will get maybe from one to three seeps in it but if you don't get enough to make a windmill it's still not dry but you can't make a water well out of it but every well will yield a little water out of something.

Q. Do you have anything else you would like to add? Do you have an opinion as to the feasibility or the desirability of these pits being salt water disposal?

A. Well, looking at the formation on the spot and the location and knowing that any drainage from there mainly is to Monument Draw which is the biggest supply of fresh water in that whole area down there, if you put it there and the water got away I think we would have pollution all up and down Monument Draw and referring to this as Ogallala I think this is completely wrong, Ogallala doesn't crop out on the top of the ground anywhere down there that I know of and when you get in Monument Draw, Monument Draw probably has the most porous fill

in it of anything in that country. It has lots of shallow water in it but most of the shallow water there carries quicksand but in Monument Draw you can almost take a high-powered air hose and blow you a well down to that first water. There is nothing solid in the Monument Draw watershed that is on the west side and the immediate bottom to stop anything and if you go down to that first water which is a lot of time quicksand, if you will case it along until you hit a strip of Redbed, set your casings and case that upper water off, quicksand water off, you can go through about twenty feet of Redbed and get real good water that doesn't have quicksand in it, a bigger supply of water than your first shallow water.

When you are talking about this being up there in Ogallala, I think you are wrong. Ogallala in all that country is two fifty to deeper.

Q. All right, do you have any salt water disposal wells on your ranches?

A. In Winkler County, Texas.

Q. Do you have more than one?

A. One.

Q. Do you have any in New Mexico?

A. No. My salt water disposal well is about fifty miles from this one.

Q. Do you feel that the present use of deep wells to dispose of salt water is a desirable method of disposing of it?

A. At least it is the best we know about today and in my opinion I would rather than use a pit as dangerous as this I would rather go back to the old surface pits that you closed several years ago because after all most of them were in clay which is the same Redbed they are talking about. I think really they are less dangerous than what you are talking about here.

MR. HOUSTON: That's all I have.

MR. RAMEY: Any questions, Mr. Richards?

CROSS EXAMINATION

BY MR. RICHARDS:

Q. I'm fascinated by that last statement, Mr. Linebery. Are you suggesting that the caliche-type disposal pits that were in use until the Rule 3221 went into effect are the same, are Redbed Triassic clay?

A. No.

Q. Oh.

A. I do know that in most instances those pits were dug in Redbed. Now, in certain areas they were dug in caliche which I am well aware of because I had probably several hundred of them on me at one time and I was instrumental in getting them closed, at least I meant to be, maybe I wasn't.

Q. Now, do you want to go back to the system that you were against before? Which do you want, Mr. Linebery?

A. Well, the way we are doing it, putting it into deep wells and on depleted oil zones I think is the best deal and most of them are doing it.

Q. Tell this Commission, sir, how -- number one, do you have any formal training in geology?

A. I believe you could answer your own question. No, I don't.

Q. Thank you. I get to ask them, Mr. Linebery, I don't have to answer them, sir.

Tell the Commission in your own words how this water, and give them the facts upon which you based your conclusion or gave your opinion, that any salt water disposed of in the pits covered by this application is going to escape from property owned by the two Wallach brothers and their sister?

A. Well, I base my opinion mostly on I just didn't see any kind of Redbed outcroppings that I heard testimony about here today.

Q. That's fine. Now, did you hear Mr. Reed describe this as a swale or a draw?

A. Yes.

Q. Okay, has it been your experience as a rancher that draws are perfectly vertical sided or do they have more of a bowed effect?

A. Well, I never saw a swale that didn't have an outlet so this one drains to someplace.

Q. Now, Mr. Linebery, the question is, are they vertical walled or are they bowed? Do they have sloping walls or do the walls go straight up and down? What has been your experience to make you an expert, I don't know that?

Mr. Linebery, I'm sorry, this Commission under its rules permitted you to give an opinion as to whether there was any Triassic clay material in the side walls of these pits and you inspected and didn't --

A. I can still give you an opinion that I did not see that kind of Triassic material there.

Q. Okay. Do the walls in a normal draw go straight up and down or do they bow?

A. They've usually got a little bit of bevel to them but occasionally you will see one straight up and down.

Q. Let me show you this. If as Mr. Reed testified the walls slope in in this draw and you can't see the wall beyond the edge of the base of it, how do you know whether there is any Redbed behind that material?

A. Well, sir, since I didn't see any here and I didn't see the Redbed here and I didn't really think I saw any here I begin to wonder if there is any here or here.

Q. But you will agree with me, sir, that the pit rim, if the Redbed slopes and the pit rim has material deposited upon it down at the bottom that you have Ogallala material, just stuff up here and you wouldn't be able to see that slope?

A. If you could prove to me that it slopes then I might take a new look at it.

Q. What would it take to prove to you that it slopes, Mr. Linebery, since you are giving us your opinion?

A. Not on the ground out there, we would just have to dig down there to expose it.

Q. Do you suppose that drilling over a hundred holes out there to find it and charting it on a map was a satisfactory way to locate it?

A. Well, I tell you what I saw out there on the ground.

Q. Did you dig any holes in it?

A. No, I didn't.

Q. Did you hear Mr. Reed testify that he did, sir?

A. I heard him say he dug holes, yes, sir.

Q. You don't believe what he said he found in his holes?

A. I'm not ready to buy it a hundred percent, no.

Q. Why is he wrong about what his holes showed, Mr. Linebery?

A. Well, I'm not buying it that they all showed Redbeds.

MR. RICHARDS: I'll pass the witness.

MR. RAMEY: In other words, if you weren't there and saw it you wouldn't believe it?

MR. LINEBERY: I just know what I saw on top of the ground and I've got reservations, yes.

MR. RAMEY: Any questions of the witness? Mr. Stamets?

CROSS EXAMINATION

BY MR. STAMETS:

Q. You mentioned a well, I guess it's there on the grounds of the gravel pit. Now, where is that located? As you drive in you come in on a black-top road and this passes the first pit there that's quite deep and has quite a bit of water in it, it's got a pump and then just on north of that pit is the office and a lot of machinery. Now, where is it located with respect to --

A. If you would place your map back up here I could locate it for you.

(THEREUPON, a discussion was held off the record.)

Q. (Mr. Stamets continuing.) Now, Mr. Linebery, over there on the left-hand side there is kind of a circle.

A. You are talking about a different kind of a map than I thought I had it spotted on.

Q. This is good enough to locate it on if you could. If I remember rightly, the pit that was deep, that has the water in it and has the pump is the one right here and then the office and everything is just up here to the north. Now, with those two points would you locate about where that well might be?

A. Well, this map doesn't look right. They had one awhile ago that showed that pit up here, I think, and I'd like to see

it.

(THEREUPON, a discussion was held off the record.)

A. This was the pit here and it was probably all of twenty or twenty-five feet straight down to the water in that pit and just right there, ten or eleven feet, not over thirteen feet from the edge of that pit was the cased water well.

MR. STAMETS: Mr. Wallach, where is your office at your gravel pit in that location while we are on this?

MR. WALLACH: It's back --

MR. STAMETS: Could you point it out?

MR. WALLACH: Well, it's approximately in the same spot you -- this particular pit is not on the map that you are looking at, this pit that he is talking about.

MR. RICHARDS: Bob, he asked you where your office was.

MR. WALLACH: All right, the office is right down in this area right here.

MR. STAMETS: It is a considerable distance then from the pit and the well that Mr. Linebery went out to see.

Q. (Mr. Stamets continuing.) Okay, now, you talked about water in four of these pits, now, are these the pits that are right there at the office or are these pits off?

A. I'm talking about this pit up here that we just talked about where the well is. Over by the office is another

and there were two others.

Q. Were the other two right there by the office as well?

A. No, and I'll tell you frankly I have been looking at those maps trying to spot them.

Q. So of the pits right there in the vicinity of the office, where they are going to put their salt water, only one of those pits contained water at that time?

A. Yeah.

MR. STAMETS: That's all the questions I have.

MR. RAMEY: Any other questions of the witness. He may be excused.

(THEREUPON, the witness was excused.)

MR. RAMEY: Do you have anything further, Mr. Houston?

MR. HOUSTON: That's all.

MR. RAMEY: Any statements?

MR. RICHARDS: May I have some rebuttal testimony, about five minutes worth, sir?

MR. RAMEY: Yes, sir.

MR. RICHARDS: Thank you. Mr. Reed.

(THEREUPON, Mr. Reed was recalled.)

REDIRECT EXAMINATION OF MR. REED

BY MR. RICHARDS:

Q. You heard ranchers Sims, Boyd and Linebery testify about the Triassic Redbed having water below it and being near

the surface and inches to a few feet thick. Do you know what they are describing as the Triassic Redbed and what is it as a scientific fact?

A. It sounds very much to me like red zones that you find in the Ogallala, generally well above the Triassic Redbed. I have drilled a number of Ogallala wells and found red, silty, clay zones in the Ogallala, underlain by Ogallala gravel and then in turn underlain by Triassic Redbeds.

Q. What is the material that underlies the Triassic Redbeds?

A. Under the Triassic are Permian age, quite a bit older formations, again in the upper part red siltstones and clays and down into the limestone and dolomites.

Q. To your knowledge, based on your experience, did the red Triassic, red deposit, ever overlay the Ogallala sands?

A. No, sir.

Q. Can you say that without fear of contradiction?

A. Yes, sir.

Q. You heard some of these gentlemen testify as to the kinds of water they found in Monument Draw and that it wasn't Ogallala water. You heard them describe that you could almost air drill to it. In your experience, and based upon your training, what do you consider that water to be when you locate it in that manner?

A. Well, the ground water in the Eunice area, Monument

Draw, is Ogallala water.

Q. Is there any dispute among hydrologists about that fact?

A. Not to my knowledge.

Q. There is obviously some dispute between hydrologists and ranchers about that fact?

A. Yes, sir.

Q. Can you site this Commission to any evidence of any sort, whether it be written or otherwise, where a hydrologist has said or a geologist has said that the water in the Monument Draw in the Eunice area is not Ogallala water?

A. Not to my knowledge.

MR. RICHARDS: That's all.

CROSS EXAMINATION

BY MR. HOUSTON:

Q. Mr. Reed, how many wells have you drilled within six miles of these pits?

A. Aside from the test holes that I have drilled, I have drilled no other wells in this immediate area.

Q. How close have you drilled a water well to these pits?

A. I have drilled them in western Texas. The closest one, an Ogallala well that I drilled, is probably a hundred miles, seventy-five, perhaps, miles to the southeast.

Q. How close have you drilled a well to the west of -- a water well to the west of these pits. You said you drilled them in West Texas, I wonder how close to the west now in New Mexico you have drilled these pits.

A. I have not drilled any Ogallala wells in this portion of New Mexico. The closest ones that I have watched the drilling on are like I say, about probably seventy-five to a hundred miles to the southeast that are again Ogallala wells underlain by Triassic.

Q. How deep did you drill down at the pits? What's the deepest well that you drilled at the pits?

A. I normally just drilled a few feet into the Triassic on all of these holes, a few feet less than fifteen or something like that.

Q. You used that wagon drill that's out there, I suppose?

A. For some of those I did, yes.

Q. What other equipment did you use?

A. For the core holes in the pits themselves I used a Mayhew truck mounted core rig.

Q. How deep did you go in those?

A. The deepest one I went in the pits themselves, my recollection is fifteen to eighteen feet.

Q. Now, did I understand you to say that you know that you recognize a Triassic Redbed by what underlies it?

A. No, sir.

Q. How do you recognize a Triassic Redbed?

A. I recognize a Triassic Redbed by having seen it in an outcrop in areas. I recognize the Triassic Redbed by its red clay nature. It is a heavy, red, dense, almost totally silt and sand free clay with a few siltstone stringers, thin siltstone stringers.

Q. You heard Mr. Linebery dispute what your analysis of the clay was in the bottom of these pits, didn't you?

A. Yes, I did.

Q. And you heard him dispute the quality of that clay from his personal observations?

A. Yes, sir.

Q. Now, since the discussion about this cased water well you still don't remember seeing it?

A. The cased water well?

Q. Yes.

A. Is this the one that is supposedly up by the cattails?

Q. Yes.

A. I have not seen that, no, sir.

MR. HOUSTON: I believe that's all.

MR. STAMETS: I have a question or two.

MR. RAMEY: Mr. Stamets.

CROSS EXAMINATION

BY MR. STAMETS:

Q. Mr. Reed, have you read Groundwater Report Number Six,

Geology and Groundwater Conditions of Southern Lea County by Nicholson and Levich, I guess?

A. Oh, at one time I think I did but it has been awhile.

Q. Would you remember that in this publication there is a section called, Aquifers in Rocks of Triassic Age?

A. Yes.

Q. And would you recall that it does mention water wells which are completed in the Triassic in southern Lea County?

A. There are, as I said in my previous testimony, some Triassic water and again the Triassic water that does occur generally occurs in these silty to sandy zones and again generally in the uppermost portions, to my knowledge.

MR. STAMETS: Perhaps the Commission should take administrative note of this report and of that section of the report.

I don't have any other questions.

MR. RAMEY: Mr. Lucero.

CROSS EXAMINATION

BY MR. LUCERO:

Q. Now, you conducted this study and presented certain findings for the purpose of disposing of salt water in certain gravel pits and you have concluded that this Triassic will hold the water with the monitor wells and all that. Have you conducted any other similar studies within, say, ten miles of

this area?

A. No, not in this immediate area I have not.

Q. Have you conducted any similar studies in southern Lea County?

A. I have not personally, no.

Q. How many studies of this nature have you conducted?

A. I have looked at the feasibility of salt water disposal and one salt playa lake in Ward County, Texas. I have investigated the possibility of disposing of waste water from an ammonia plant in the Panhandle which I found totally unacceptable in that particular case. That's all I can remember off the top of my head in the last few years or so.

Q. Any with respect to the existing gravel pits with this Triassic formation as in this case?

A. No, I have not looked at this particular type of case.

Q. So this would be your first one?

A. Yes, sir.

MR. LUCERO: I have no other questions.

MR. RAMEY: Any other questions?

MR. RICHARDS: No, not of this witness.

MR. RAMEY: The witness may be excused.

(THEREUPON, the witness was excused.)

(THEREUPON, Mr. Wallach was recalled.)

REDIRECT EXAMINATION OF MR. WALLACH

BY MR. RICHARDS:

Q. Let me ask you how many gravel pits there are in Lea County?

A. I'm aware of only two at this time.

Q. Thank you. To clear up for the Commission what the situation is on the pond or the dig-out or the pit that was dug a half to three-quarters of a mile north-northeast of your office facility, when it was done, what it was for and if there was a cased well out there.

A. Well, like I said before, that is where my dad tried to develop water at that time.

Q. Let me ask you, were you successful?

A. Not to the extent where we had enough to operate the plant.

Q. And how many years ago was that?

A. That was probably in 1954 or '55.

Q. Thank you.

A. Now, the well, the casing is right next to the sheer bluff where we dug and we put that strictly in there to pump the water out. There is no pump in the well and there hasn't been a pump in the well for the last -- the pump that is in there wasn't even used for the last eight or ten years.

Q. Was it to pump the water out of the pit or the well beside the pit?

A. Well, it was to pump the water out of the pit to the plant and this is what I said about the drilling rig was the last one to use that pit and we tried to furnish some water to them and we didn't get enough and they had to run another line to our plant to pick it up out of the pits there, out of our settling pit where we put the water in from our gravel and they used water from that to drill their well with at that time.

MR. RICHARDS: I'll pass the witness.

MR. RAMEY: Any questions? Mr. Lucero?

CROSS EXAMINATION

BY MR. LUCERO:

Q. I'm just curious about that well. You said that you didn't get enough water to operate the plant, how much water would the plant use if the well would have furnished it?

A. Well, I mean this was just for a supplement. It uses a lot of water but we have what we call settling tanks there and we recirculate this water. We get all of our water from the two wells in the Monument Draw and they pump very little water and we supplement with city water. We get most of our water from the City of Eunice and the City of Eunice does not have any wells around Eunice. They get all of their water from the Ogallala formation in Hobbs. It is piped

twenty-two miles into the City of Eunice is where they get their water and we purchase water from the City of Eunice to furnish our plant with.

Q. Was fresh water secured from this well?

A. There was not enough to run the plant.

Q. I understand that.

A. There is water in it now, Commissioner, you know, like we say there are cattails in there, there is a little seepage on the bottom of that thing. This is the furtherest north in that pit area.

MR. LUCERO: That's all.

MR. RAMEY: Any further questions of the witness? He may be excused.

(THEREUPON, the witness was excused.)

MR. RICHARDS: The applicant is at rest.

MR. RAMEY: Do you have anything further to add, Mr. Richards?

MR. RICHARDS: By way of testimony?

MR. RAMEY: Or statements?

MR. RICHARDS: Mr. Chairman, I would ask that the Commission take judicial notice of its own trip to the site as to whether or not there is a presence of springs or the filling of water in those pits. I'm aware that the Commission made an on-site inspection and I ask them to take administrative notice of their own observations there.

MR. LUCERO: I would like to correct the record. This is one Commissioner who did not make an on-site inspection.

MR. RICHARDS: I'm sorry, I understood that this was going to be a full dress show and --

MR. RAMEY: The Director of the Commission and several staff members made the inspection.

MR. RICHARDS: I'm sorry, I understood that all three of the Commissioners were going. May I ask the Director to take administrative notice then and share his findings.

I think this is, you know, a novel situation, don't make any bones about it. I don't think this Commission has ever had a more detailed and open engineered study of a disposal system as an exception to Rule 3221. I think you have heard the testimony of Mr. Reed. He came in and told you that to do it, to put the necessary safeguards on it, things he would recommend be done.

I will not attempt to comment upon the difference in the weight that this Commission should give to the evidence of a well-trained hydrologist with an extensive geological background who Sandia respects enough to hire to do their probably most critical underground hydrological testing that has ever been done in this world and especially in New Mexico near Carlsbad and the ranchers -- I won't even comment on that. They didn't bring any witnesses, they brought cowboy opinions. I think they are welcome to their opinions and this Commission

is welcome to give it some weight but you honestly need and as a matter of scientific and fact deserve. I respect these men and like them and maybe the Commissioner asked the right question of Mr. Linebery. If you didn't see it and feel it and touch it and look at it and do it yourself it just didn't happen.

I think this will work. These people are in an unique position. Commissioner Lucero doesn't have any gravel pits to compare this one with, it's the physical situation. They have the ability to deepen these pits within the area that is described and covered in the report, to level, to bank with material that is on testing, not on anybody's opinion, this is the test at Southwestern. This is beyond the standard set by the Texas Water Quality Board for this sort of thing, it has got more free board and it can contain it totally within that area. I believe it will work and they are in an unique position, they not only have the area but have the equipment to do the dressing up that will make it work. I consider it to be far superior to the typical playa disposal that we have some around Lea County. There has never been the kind of test done that's done here in a limited and controlled environment. If there is ever another gravel pit, a Triassic trough type application comes, I think this will set the standard of excellence for the review and for the engineering that needs to be done. They will do whatever reasonable restrictions this

Commission wants to put on it and if the restrictions this Commission want to put on it are economically impossible to meet then they obviously won't do it at all. I think this may be a construction permit approach and they get a certification of completion according to your requirements and bring it back.

That's all I have to say.

MR. RAMEY: Mr. Houston.

MR. HOUSTON: Mr. Chairman, with due deference to Mr. Reed's scientific qualifications, I think that the experience that these ranchers have brought here to the Commission concerning the formations that they drill into in their water wells is of genuine merit and should be weighed carefully because regardless of what might be written in the text about the nature of this Triassic Redbed, I think that in drilling these wells we know what exists down there in that region.

I think Mr. Sims' testimony concerning gravel pockets and sands and other stratas there are without a doubt there. The presence of water is undisputed, the presence of live water.

Mr. Richards says that this is a far more desirable method of the disposal of salt water than ponds. We are not here to argue that. I don't think that there is any doubt about it that the disposal of water in depleted oil producing zones is far superior to any surface disposal. We have ample

wells in that region that have been depleted to dispose of in. Mr. Linebery's comment that he would rather go back to the small, individual surface pits rather than this gravel pit didn't mean that he wanted to abandon the Commission's present use of disposal wells, rather he was emphasizing the fact that he considered this a great danger to our water supply and I think all of the ranchers feel that way and frankly I think all of the citizens of the area would feel that way if they were apprised of this.

I think Mr. Linebery's on-the-site inspection and observation of the base of the bed of the pits is probably more accurate than Mr. Reed's evaluation on it. I'll admit that I've never drilled a well but I went on the site with Mr. Linebery and I did not observe what Mr. Reed testified to here today.

MR. RICHARDS: May it please the Commission, if Mr. Houston would like to testify we might as well have the opportunity to cross examine because he is testifying, not closing

MR. HOUSTON: The Commission Director went there and observed it and I trust formed an opinion as to what he saw.

Lots of times we get all wrapped up in scientific opinions but as was asked of Mr. Reed, this is his first time to attempt something like this and although I'm willing to give him the benefit of his statement that he thinks that it will work, we certainly don't have any assurance that it will work

and I think we are entitled to look at the worst as far as our water supply is concerned to safeguard it and one way of safeguarding it is by the use of disposal wells. There are numerous ones operating in the area and the water is being disposed of and others could be opened up if necessary.

I don't think this is a reasonable use for these pits, especially in the location right on the eastern edge of Monument Draw.

MR. RAMEY: Thank you, Mr. Houston.

MR. RICHARDS: May I rebut? I ask the Commission to take administrative notice of the problems, if any, they are having with subsurface disposal in the Eunice, New Mexico area by disposal wells.

MR. RAMEY: Thank you, Mr. Richards. I don't believe you have to remind the Commission of that, they are aware of the problems.

MR. RICHARDS: Well, this is in relation to Mr. Houston's statement in this case.

MR. RAMEY: Thank you, Mr. Richards, we will take administrative notice of the waterflow problems in the Eunice area.

Anything further?

MR. RICHARDS: I thank you for your patience.

MR. RAMEY: The Commission will take the case under advisement and the hearing is adjourned.

(THEREUPON, the hearing was adjourned.)

REPORTER'S CERTIFICATE

I, SIDNEY F. MORRISH, a Certified Shorthand Reporter, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me, and the same is a true and correct record of the said proceedings to the best of my knowledge, skill and ability.

Sidney F. Morrish, C.S.R.