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APPLICATION OF 130 ENVIRONMENTAL PARK, LLC, FOR PROPOSED PERMIT NO. 2383	)	STATE OFFICE OF ADMINISTRATIVE HEARINGS

ORAL VIDEOTAPED UNSWORN INTERVIEW OF

WILLIAM FEATHERGAIL WILSON

June 22, 2016

ORAL VIDEOTAPED UNSWORN INTERVIEW OF WILLIAM FEATHERGAIL WILSON, produced at the instance of the Protestants, was taken in the above-styled and numbered cause on June 22, 2016, from 10:42 a.m. to 12:42 p.m., before Lou Ray, Certified Shorthand Reporter in and for the State of Texas, reported by computerized stenotype machine at the Bandera Public Library, 515 Main Street, Bandera, Texas 78003.

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Mr. Dennis Hobbs

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WEDNESDAY, JUNE 22, 2016

(10:42 a.m.)

THE VIDEOGRAPHER: Today's date is June 22nd, 2016. This begins the testimony of William Feathergail Wilson. We're on the record. Time is 10:42 a.m.

WILLIAM FEATHERGAIL WILSON

QUESTIONS BY MS. PERALES

Q Good morning, Mr. Wilson. Let me start by introducing myself. For the record, my name is Marisa Perales, and I'm an attorney representing a number of individuals and groups of individuals and parties who are protesting a proposed landfill by 130 Environmental Park. And I'm here today to ask you some questions and have your answers transcribed in response to my questions. Is that clear to you?

A I understand.

Q Okay. Can you introduce yourself and spell your name for the record?

A My name is William Feathergail Wilson. It's William, of course. I'm sure you can spell that. Feathergail is G-A-I-L rather than G-A-L-E. It's all one word. And Wilson is an easy one to scribe.

Q Right.

A So, you know, I'm -- what else do you want to know.

Q That sounds good.

MR. ROBERT WILSON: Before we get started, let me just state on the record -- on the transcript --

MS. PERALES: Sure.

MR. ROBERT WILSON: -- what I've done is I've -- because of some -- the filing of a motion to quash and I've asked Feather -- he's here for Plum Creek Conservation District, but I've asked him not to be sworn. And this basically is an interview of him where you get to ask any questions you care to ask about the application. I presume they're all about the application. I don't know what else you'd ask. And then you can -- you're free to record your questions and his answers, but it's unsworn.

MS. PERALES: Right. Sounds good.

Q (BY MS. PERALES) So, let's see. Are you aware that -- that I have prepared and served a notice of deposition for you for today?

A Yes.

Q Okay. And we are in Bandera. Is that correct?

A Yes.

Q And this is the -- if not the town, then the area of your residence. Is that right?

A That's correct.
Q Okay. And so do you -- you live nearby?
A I live in the county.
Q Okay. And so this is a convenient location for you?
A Yes, it is.
Q And the purpose of this interview -- we'll call it an interview today -- or the reason that we're here today is because I'd like to talk to you and ask you a few questions related to the proposed 130 Environmental Park Landfill in Caldwell County. So I'd like to begin by asking you what exactly your role is with the Plum Creek Conservation District.
A I'm a consultant to them for groundwater and surface water.
Q Groundwater and surface water?
A Yes.
Q And what is Plum Creek Conservation District?
A They're -- they're a WCID and a groundwater district.
Q And WCID is --
A Water control improvement district.
Is that right, Bob?
There's only five of them, I think, in the state, something like that.

MR. ROBERT WILSON: I'm not being deposed.
MS. PERALES: Right.
MR. RYAN: Nobody is, so I guess you can chime in.
BOB: I guess I can.
(Laughter)
Q (BY MS. PERALES) How long have you been employed as a consultant by --
A 10 years.
Q And have you been in the same role those entire ten years?
A Yes.
Q So a consultant on groundwater and surface water for 10 years to PCCD?
A Yes.
Q Tell me a little bit about your -- your qualifications that led you to this position. Let's start with your education.
A I have three degrees from The University of Texas at Austin; two in geology, bachelor's of science, master's degree. I have another degree in creative writing and -- that helped me a lot in my career.
I have 56 years of geological experience in 54 countries or more -- actually, more countries than that because I recently came back from South America

about a year ago. I was working -- let's see -- Bolivia, you add that one -- Paraguay, Uruguay, Brazil and Columbia. I don't know how many that is, plus 54. I once counted this up and -- but lately I haven't counted it up. So I'm not sure -- maybe 60 countries. And I've actually drilled wells in 60 countries. So -- and I was the vice president of a major, independently owned oil company. We had -- we worked all over the world. I've worked for Pemex also in Mexico.

Q How long were you in Mexico?

A Two years.

Q And when was that?

A '61 to 63 -- or '60, something like that.

Q So are you a professional geologist?

A Yes, I am.

Q And how long have you been a registered professional geologist?

A Since the initiation. In fact, I have a -- I'm No. 1 -- or No. 21, which is the first registration in Texas other than board members. Because I'm a Democrat or independent, and George Bush was in power then, even though I was offered to be a board member, when I went to interview, they asked me what my politics was and I said, you know, not Republican, and that was the end of that.

(Laughter)

A So I've never been a board member. But I did -- I was instrumental in actually creating professional geologists of Texas and -- you know, so I've been there for the initiation and before.

Q (BY MS. PERALES) You were instrumental in creating the Board of Professional --

A Yes.

Q -- Geoscientists?

A Uh-huh.

Q So what was your role in that?

A Oh, just a -- you know, an advisor, consultant, an interested party. But 21 is the first number beyond the board members. So -- and there are about, what, 8,000 today or something like that. I'm not sure.

Q Did you have a role in drafting or providing input into the rules that govern professional geoscientists?

A To some degree.

Q To what degree?

A Well, ethics, for one, and requirements; educational requirements, continuing education requirements and past education requirements.

Q Did you help draft those requirements regarding ethics and continuing education?

A No, this was just the result of informal meetings.

Q I see. So you provided information to the drafters of the rules and the ethics requirements?

A Yes. I'd add exams, too. We require exams.

Q So -- okay. So you were at Pemex for two years, and then I wrote down that you were the vice president of an independently owned --

A No, I was with Texaco at the time.

Q Okay. So, well, tell me, after Pemex where were you or what did you do?

A I worked for -- worked for Texaco for five or six years, then went to Midland and worked for El Paso and then became an independent consultant. I then came back to San Antonio and I worked with Tesoro and Placid, and then finally Exxon. But not in San Antonio, in Dallas and Houston.

Q Other than your role with PCCD, are you currently employed as a geologist or a professional geoscientist?

A As a consultant, yes.

Q As a consultant? Okay. So you are currently consulting for other entities?

A Oh, yes.

Q And are you -- so you're an independent

consultant?

A Yes.

Q Okay. Are you consulting for any other public entities? And by that I mean like local governments, like Plum Creek Conservation District?

A I've done some pro bono work for the -- this groundwater district and others. But mostly I'm employed by -- yes, I guess the Nature Conservancy. I don't know what you would call that, but I just finished a job for them.

MR. ROBERT WILSON: Feather, I'm going to jump in. Why don't you identify if you serve on any boards or commissions related to water.

A Well, I've been working on a lot of Class 2 injection wells lately. I worked on a -- I don't know, hundreds of them across Texas and Wyoming, New Mexico. And I have testified to the Railroad Commission for hearings and -- with regard to that. I'm still doing quite a bit of work on injection wells. You know what a Class 2 injection well is? Okay.

Q So why don't you explain it for the record?

A A class 2 injection well is a well that is an oil and gas waste well for produced water and fracked water. I have worked all over Texas, particularly West Texas and South Texas, and I'm still engaged in doing

some of that consulting work.

Q Okay.

MR. ROBERT WILSON: The specific question I had in mind was your relevant regional planning group. Do you serve on that?

A Oh, yes. I'm a board member of Region J Planning Group, which is one of 16 planning groups for groundwater in Texas. I'm a board member. I've been a board member seven -- eight years, something like that.

Q (BY MS. PERALES) And so as a board member for the Region J Planning Group, are you providing input or helping create a regional water plan?

A Of course. Yes.

Q That is then incorporated into the statewide plan?

A Well, I'm the only geologist on the board.

Q Okay.

A So not only do I advise them geologically, I, you know, also work with the consultant who's -- which is LBG Guyton --

Q Uh-huh.

A -- as sort of the advisor and translator from LBG Guyton to the board members.

Q Are you a member of any other boards or commissions?

A No. I'm a member of -- a number of geological societies and scientific societies.

Q Okay. So as a professional geoscientist, do you have to take any education courses?

A Of course.

Q How many hours do you --

A 16.

Q Ever year?

A Every year.

Q And what kind of consulting work do you do for PCCD? And I understand that you advise as to groundwater and surface water, but can you give us some general examples or descriptions of the types of issues that arise that you address?

A I make monthly presentations of geological studies that I've done and continue to do on all types of really most groundwater, oil and gas, just anything that actually occurs to me, and anything I'm asked to do, which I am asked to do several things from time to time for permits. I'm on a retainer.

Q Okay. So you provided some geological studies or information related to geological studies to the PCCD board?

A Yes, I do.

Q And that's in the area of -- well, you tell me.

What area of --

A Primarily groundwater.

Q Okay.

A Next month, however, it's going to be on surface water and the dams -- 28 dams, the geology of the dams and what they're constructed -- how they're constructed and which formations they're constructed over. And we have 28 dams, and we have some issues with some of them.

What else do you want me to say about them?

MR. ROBERT WILSON: I'm not asking the questions right now.

A I mean, it's all related to geology.

Q (BY MS. PERALES) So the 28 dams -- you mentioned the 28 dams. Those are in the control or -- or PCCD is otherwise responsible for those dams?

A Yes, they are. I'm not sure exact -- Bob can address that better than I can. But we -- this is for my own -- for my own learning. We maintain the dams. The NRCS also has some control over the dams. They were built as flood control dams. There is rehabilitation on some of the dams that I've worked on going on right now as a matter of fact. You know, just a variety of things that I might be asked to consult on geologically.

Q So you mentioned that some of the dams are being rehabilitated right now?
A Yes.
Q How many of the dams --
A One is being rebuilt.
Q And which one is that?
THE WITNESS: Which one is that, Bob, 6 or -- yeah, 6, Dam 6.
Q (BY MS. PERALES) And why is it being rehabilitated?
A Well, they're very -- some of the ADD (phonetic) dams are very old and they -- they really need, actually, to be rebuilt. But many of them -- most of them are in good shape. But there are, how many, Bob, six -- five or six that are scheduled to be fixed. And that's a -- that's a lot of money.
Q So who -- who is responsible for rehabilitating those dams?
A The NRCS and PCCD.
Q And on Dam 6 is that who's --
A They're being done right now.
Q And that -- the NRCS and PCCD are funding the rehabilitation?
A Yes.
MR. ROBERT WILSON: And, I might add --

Feather would not know this -- but Soil and Water Conservation Board is also contributing to the funding of the rehabilitation of Site 6, Texas Soil and Water Conservation Board.

Q (BY MS. PERALES) Is Reservoir 21 -- is that -- does that include one of the dams that needs to be rehabilitated?

A I can't remember. I don't think so, although I've done some studies on it recently, looking at the dam itself and the geology -- the substrate below the dam. And, of course, the geology below the lake, the reservoir.

Q Okay. Who makes the determination as to which of the dams needs to be rehabilitated and how to prioritize them?

A NRCS, I guess.

Is that right, Bob?

I'm not sure. We have consultants that --

Q (BY MS. PERALES) Uh-huh.

A -- that have -- NRCS has consultants and they have their own staff. And the dams are in an area of what's called high hazard area, which means that many people downstream are now -- the downstream areas are being populated more and more in this area, which -- very cognizant of how competent these dams are all the

time. This is in the fastest growing area of Texas.
Q When you say "this," what are you talking about?
A I'm talking about this area, this 13-county area, including PCCD District, is within the confines of the fastest population increase in Texas.
Q And that has an impact on the dams?
A Sure.
Q And how is that?
A More population around the dams and below the dams.
Q "More population" means more people at risk?
A Yes, if they failed.
Q Does the -- does the growth also have an impact on -- on drainage --
A On what?
Q On drainage or flooding?
A Oh, yes. Of course.
Q And how so?
A Well, you're going to have less sediment and more runoff from pavement. That's a given. In fact, I think we've actually -- they calculated a lot more sediment being introduced from farm land and it's not happened, as I learned yesterday.
Q So are you familiar with the 130 Environmental

Park proposed landfill?

A To some degree.

Q And is it within the boundaries or the area that is covered by PCCD?

A Yes.

Q How did you first become familiar with the proposed landfill?

A Become familiar with it? I guess board discussions. I don't really recall. It's been three or four years.

Q Okay. Have you reviewed any materials as are stated with the proposed landfill?

A I'm sorry. What did you say?

Q Have you reviewed any materials, like application materials?

A Yes, I have.

Q What have you reviewed?

A I reviewed a first lengthy report, and I've also reviewed recently the additional -- I guess repeated coring. I don't -- never understood why it was re-cored, but I've looked at all those cores at least from the standpoint of descriptions. I have not been in the field to looked at them. I've seen pictures of them. I've seen descriptions of course.

Q The lengthy report, do you know if that was the

geology report from the application or do you recall?
A Yes.
Q It was? So as far as you recall, you've reviewed a portion at least of the landfill application?
A Yes.
Q And then you mentioned you also reviewed information related to repeated coring?
A Yes.
Q And was that information -- or do you recall whether the coring was done by the -- that you reviewed, was it done by the 130 Environmental Park applicants?
A Yes.
Q And you said you never understood why they did repeated coring.
A I don't know.
Q Okay. Do you have an opinion or --
A Well, there was some question as to the lithology descriptions I think, not the least of which was the overburden of the Leona gravel. And I think it was originally reported -- I may be wrong about this -- that there was no Leona gravel there, despite the fact that it was mapped by the Bureau of Economic Geology and it was within the -- some of the descriptions, early descriptions I read, and especially the second coring situation -- actually, isopached, which means I drew a

thickness map of the Leona gravel and -- which is important.

Q Okay. So when you created this isopach map of the thickness of the Leona gravel, what information did you use?

A I used the new coring data.

Q Okay. I'm going to back up a little bit and make sure I have a good understanding of -- of any concerns you have regarding the proposed landfill. So this is a general question: Can you generally describe for me any concerns that you have as a geologist for PCCD regarding the proposed landfill?

A Well, the main concern is the fact that adjacent to the berm, the Wilcox is exposed beneath the reservoir and to the west of the reservoir to a slight degree, and that is a recharge zone to the Wilcox, a freshwater area, and it -- that's one concern. That's the main concern.

But concerning why that's a concern is the fact that if they use the Leona gravel within the berm -- and there's a considerable amount of gravel there -- and it is incorporated into the toe of the berm, then it might induce leachate pathways that could contaminate the reservoir and the underlying Wilcox. That's one of the concerns based upon the geology.

Another concern is based upon climate. I live on a creek and I have lived there for 35 years -- or at least owned it for 35 years. I grew up on a ranch in Comal County. I'm very familiar with droughts and rainfall. I have a 20-year-old rainfall station. I actually have a professional weather station I maintain, because I write a science and agriculture column for the local paper, and I put that in every week as to what is going on.

It's been my opinion and my notation that we're having hundred-year floods about every five years, and I think that's due to climate change, definitely due to something. If you're interested in the floods in Bandera, there's a diorama right out here, just past the bookcases --

Q Okay.

A -- and you will see all the floods that have occurred here, and they're substantial.

Q And your concerns about climate change and the frequency of hundred-year flood events, can you tell me how that impacts your concerns related to the proposed landfill?

A Well, I'll start with a story about D'Hanis, Texas. In 1935 D'Hanis had more than 24 inches of rainfall in two hours, and it filled up a water trough.

And that happens to be a meteorology course I took at Texas, one of the many things. And it was a world's record. In 1979, Alvin, Texas had about 49 inches from a hurricane. Of course you know about the Wimberley floods recently. There just seems to be -- since the 1950's, there has been an increase in the frequency of very high rainfall rates punctuated by drought. And that seems to be one of the patterns that's developing in Texas from the global warming and the increase in the carbon dioxide and methane in the atmosphere.

Q And so what I'm wondering is how the impacts of -- or how the consequences of climate change are going to --

A Well, there's two reasons.

Q Okay.

A One is -- let's -- I have to project what could happen to this landfill. Let's say it filled up with garbage, and the leachate became contaminated and it would begin to seep through the berm into the -- into the lake and then, subsequently, into the Wilcox.

The other concern is the fact that if you had a catastrophic rainfall event, say 24 inches in 24 hours or even higher rates, you could have an overflow of the berm itself. And the leachate would flow over the berm and out into the lake, and that means it could

also contaminate the Wilcox. That's -- in summary that's most of what could happen. I'm not -- this is all hypothetical.

Q Uh-huh.

A But it -- it could be a potential threat. Now, if the landfill had been sited all within the Navarro formation away from any -- any waterway, I think that might have been a better choice.

Q What is it about the Navarro formation that makes it --

A The Navarro is an expansive clay, a weathered ashfall, very thick. It -- it is a clay that -- it's about 1500 feet thick. It expands when you hit it with 200 -- you know, 200 percent when you hit it with water. It's called a smectite. And if it's away from any water course, it's -- it's a much -- better at holding whatever is dug into it. You know, it's -- and it's not adjacent to the Wilcox or any other aquifer.

So it's probably the -- if you look at the population increase that's happening in this area, it's -- it's grown from about 4 million to about 11 and a half million by 2050. There is a need for landfills, a great need, unless we just recycle everything, which I also advocate as much as you can. And I'm -- and I do that myself. I have a burn barrel for things I can't

recycle, but, you know, everything else goes into a recycling area.

But nevertheless, there is a need for landfills, as there is a great need for water. And there's not enough freshwater for this area because of the population growth. But there are ideal pieces of geology that are very wide and very thick for this area for landfills, and that is the Navarro formation.

Now, the Midway is not an expansive clay. It's a -- it's a clay all right, but it also contains silt beds and it contains -- it's really almost a -- there's a thing we use, a term we use in the oil and gas industry, called Midcox, which means the Midway and the Wilcox are -- at least the upper part of the Midway -- are one and the same; that you have turbidite deposition within the upper part -- part of the Midway. Turbidites are -- are silts and sands that form off the slope of a deltaic system. Well, that was noted in some of the recent cores. So that could create, hypothetically, pathways.

Now, I have worked on other landfills, and I used to teach a course called Environmental Science and Technology worldwide. I've taught it for 12 years. And I've also done a lot of Phase 1 and Phase 2s on different types of contaminated sites, including a

landfill -- former landfill. And one of the things that was noted is the geotechnical textiles -- the geotextiles do crack and solvents will also devitrify them, as well as sunlight and inducing cracks, especially along the edges. And I've seen the same thing in the oil and gas industry, even though they're lined. And so that represents potential pathways for leachate.

So I'm not totally unfamiliar with -- with landfills or pits, and, you know, that's a concern adjacent to a -- to a -- an aquifer outcrop.

Q What landfills have you worked on?

A There's one particular landscape in Chambers County I worked on, which, actually, the pit failed and the liner failed, and it was a very large plume of leachate that got into, I guess, the Gulf -- Gulf Coast aquifer.

Another one I worked on -- this is not well-known. Galveston used to be a naval nuclear submarine base, and there was a number of sand pits around there. The nuclear waste was deposited in the sand pits as well as other stuff, you know, unlined pits. And I was -- I did testify in a case as to -- in that situation. And it wasn't just one sand pit. It was multiple sand pits. Well, they've stopped -- they

stopped putting nuclear waste in the sand pits -- and this was south of Houston around NASA, between NASA and Galveston. I don't think this is well-known.

It did go to court and I did testify and I did do drilling in that area in the sand pits, because I wrote a book, a textbook, on naturally occurring radioactive material, published by PennWell Publishing, which is the publishing company that publishes the Oil & Gas Journal. And so I have some familiarity with naturally occurring radioactive material.

Q And so -- and that's how you got to work on --

A Yes.

Q -- this trial?

A Yes.

Q On the Chambers County landfill, what kind of landfill was that?

A What?

Q What kind of landfill?

A I'd call it illegal landfill. I don't know. The United States Navy --

Q Oh, I'm asking about the Chambers County one.

A It was a TCEQ-approved landfill.

Q Okay. So --

A Originally.

Q And it had a liner?

A Yes.
Q Okay. And so the liner failed and there was --
A A plume.
Q -- a plume --
A Contaminant plume.
Q How was that addressed?
A Well drilling, monitor wells.
Q Okay. And anything else?
A No. I actually was hired to map it and look at all the -- all the monitor wells and did a geochemical analysis of it.
Q So you weren't part of any effort to --
A Clean it up?
Q Yeah.
A No.
Q Do you know if it was cleaned up?
A I don't know.
Q Or maybe just contained?
A I don't remember what happened.
Q Okay.
A It's been a long time ago.
Q Okay. So you had some opinions related to the geology in the area of the reservoir and the proposed landfill and the soil conditions, but I want to ask you so that we understand kind of the bigger picture. Can

you describe for me the -- your understanding of the geology in the area of the -- of the reservoir and the proposed landfill and the basis for your understanding?

A I think I just explained that awhile ago in that there are possible contaminant pathways from the leachate that could develop within the landfill. And as a consultant to PCCD, I have to report that to the Board. Although the Board has taken no side on this. They are neutral. I think it was -- it was my duty to tell them that the Wilcox recharge zone was directly below the reservoir and slightly to the west, and that is a key factor if any spills did occur or any leachate contaminant pathways were created.

Q That -- yeah, that's my question. And directly to the west. So do you -- do you have any knowledge about how far to the west the Wilcox extends?

A There is some question about that. The Bureau of Economic Geology has mapped it. It definitely shows that on the geologic maps in relationship to the easement boundary. And then I also looked at some of the cores for the dam as originally built, and their -- the descriptions are terrible, but they do give some indication that the Wilcox extends a little bit beyond what is mapped. Although, without drilling additional core holes and transects, that would be difficult to

prove. I mean, if you're going to describe samples, you need to describe them with a microscope on site. And you need to describe every foot, or you need to run very sophisticated electrical logs -- or both, actually both. And I've done a lot of that in drilling many wells, thousands of wells.

Q Why is it important to -- or when you're observing samples, why is it important to observe them on site and with a microscope and every foot?

A Yeah, well, when I do that, I usually -- it's environmental wells, which is what I've been doing most -- and water wells. You -- it's important to be able to pick casing points, to cement off zones that you don't want to complete in. It's important, for example, in Class 2 injection wells to pick the tops of formations such as if you're going to drill into the top of the Edwards, you need to know where it is and you can't log it first. You have to log it with -- by eyesight and knowledge and a microscope.

I'm from kind of an old school at The University of Texas where rocks were a lot more important than they are today because seismic is more important today, and computers, and both of them will tell you lies.

(Laughter)

Q (BY MS. PERALES) But the rocks speak the truth?

A You can't deny the rocks.

Q Okay. And so as a geologist, you would say that there is information to be gleaned out in the field from field observations that you can't get otherwise. Is that --

A Absolutely. No question. You want me to give you an example?

Q Sure.

A In the ATP UA well that was just recently drilled in No. TH 1, which is a test well for the Carrizo production, they had samples. They had thrown away the samples on the No. 2. And I ran the samples with a microscope and sieve -- and sieved the analysis of all the sands and found that the coarse material was composed of silt, stone pieces as big as your little fingernail, which was described as coarse grain sand. Well, that was a mistake. It wasn't coarse grain sand. It was coarse grain pieces of siltstone that were impermeable.

Well, that makes a big difference when you calculate transmissivity or hydraulic conductivity. So -- and it also makes a big difference as to put -- you set a screen size. Well, the screen size in this

particular well was set as a very coarse grain screen size. Well, it happens that most of the sand was very much finer than that, invaded the well and cut down the production well. If I hadn't looked at the samples which the other geologist didn't, I wouldn't know that.

Q Uh-huh.

A You know, it costs a lot of money. My stuff didn't cost a lot of money but, you know, the $200-a-foot screen did and how you set it and where you set it. So looking at rocks is extremely important because geology is a mystery. You've really got to look at all the things that go into it. You've got paleontology, lithology, sophisticated logging. You can't just -- well, if I was Superman it would be all right, but -- you know X-ray eyes. But otherwise you have to use all the tools at hand. And that's maybe just my philosophy, but I have a lot of experience doing it.

Q Okay. So is it also customary when you're out on site and collecting all of this information, all of this truth from the rocks, to take notes and record your observations?

A Absolutely. The field books are imperative.

Q What about samples? Do you collect samples and maintain those?

A Yes.
Q And why is it imperative to collect field notes --
A Field notes?
Q Uh-huh.
A Well, there's no record of what you've done if you don't. I've been in several depositions where I've looked up my old field notes from 10, 12, 20 years ago, and used them as what happened when I was there and what I described. I also am very careful how I print those notes, because a lot of field notes are so scribbly you can't read them. But I believe that field notes and field books -- and this is one of the things I learned at The University of Texas in graduate school, that field notes are very, very important. And I, you know, have believed in that ever since.
Q So you have field notes from 20 years ago?
A Longer than that.
Q So do you keep them indefinitely?
A Yes.
Q What about samples? How long do you maintain those?
A I don't keep them indefinitely, but I do keep a -- I do make lithologic logs and very carefully done lithologic logs, and I correct the tops by going back to

looking at the electrical logs. And I've done that on many, many wells, water wells and oil and gas wells.

Q So, let's see, we have jumped around a bit. I didn't quite finish up the conversation on the Wilcox. And you mentioned that there were some -- let me see -- cores from the dam, and I think I have copies of those.

MS. PERALES: Can I get this marked?

THE REPORTER: As Exhibit 1?

MS. PERALES: Yes, Exhibit 1.

THE WITNESS: I've looked at this.

THE REPORTER: Hold on one second.

MS. PERALES: -- consecutive pages?

UNIDENTIFIED SPEAKER: Yeah.

MS. PERALES: Oh, this is all together.

THE WITNESS: This is an original map of the coring --

THE REPORTER: One second.

MS. PERALES: One second.

MR. ROBERT WILSON: She has to take the words down or it doesn't count.

MR. RYAN: Is there more than one?

MS. PERALES: More than one exhibit? Oh, there are several pages to this one exhibit.

(Exhibit No. 1 marked)

Q (BY MS. PERALES) So can you take a look at

this document and tell me if you recognize it and whether you can identify it?

A Yes, I have looked at it. It's an NRCS Department of Agriculture coring test across where the dam was going to be constructed. I think it's -- I think its the same one. But I did look at it. Yes, it's the same one. And, by the way, the descriptions are terrible.

(Laughter)

Q (BY MS. PERALES) So is this what you were referring to earlier when you talked about the cores from the dam --

A The Wilcox being -- extending a little bit? Yes. And particularly the northern part, which is this area (indicating). Because right at the dam itself there's three different -- the three different exposures below the cutoff trench, and that is the Wilcox, the Midway and the Leona, all three. The dam was built over all three units. And, of course, the Leona is also a permeable section, as well as the Wilcox. The Midway is much less permeable -- impermeable. And I recently finished mapping this area, which will be presented next month at the board meeting.

But when you get back up into the reservoir, all of it is Wilcox. But right at the dam

itself there's three different formations.

Q Okay. And, let's see -- and that's reflected in these -- in this Exhibit 1?

A Yes -- I can't remember now. It's been some time since I looked at it. There's sand described in some of the -- in some of the -- I remember looking at it and thinking that I had to go to this northern area to where I thought the Wilcox might be exposed, a little bit further to the west, rather than the dam itself. I don't know. I think this is a -- this a spillway that should be over here, but it's up here.

Q Okay.

A At any rate, I had to look at some -- some of these wells. I recall thinking that out -- you know, not in the dam but out just a little bit to the north of the dam on one of these transects. This one could be -- possibly be an exposure to the Wilcox. Well, if you look at the map published by the Bureau of Economic Geology at The University of Texas, which I used to work for as a graduate student -- I mean, there's no question that the Wilcox is there. But the -- the descriptions were extremely poor.

Q Uh-huh.

A Done by who knows what -- not a geologist I hope. So there's just a hint of this situation, but I

certainly couldn't stand up and holler about it.

Q Okay. You couldn't holler about the extent of the presence of the Wilcox? Is that -- what?

A Oh, yes, I can say that the mapping that the Bureau of Economic Geology has done is correct --

Q Okay.

A -- except for the -- except for the possibility that it's extending a little bit, maybe a hundred feet, something like that, to the -- to the west.

Q Okay.

A But I wouldn't put any credence in these descriptions to any real degree. I don't like -- I don't like the way they described it or the -- it's not described in great enough detail.

Q Okay.

A I mean, you know, the S gas and the T and S-I-G -- I mean, I guess it's sand or -- there's gypsum I recognize; there's gravel, very coarse gravel you see on 164851, 852. That's correct. Once it -- well, that's the Leona.

Q So did you say that the gravel indications appear to be correct?

A I don't really know.

Q Okay.

A I mean, this is -- this is before my time.

1961, that's when I started as a geologist with Texaco.

Q Okay. Do you -- can you take a look at the -- at the note here that starts with the soil classifications shown on this sheet?

A It says the operation geologist looked at it. They're not always -- in not all the cases do they agree with the classification submitted by the soil mechanics laboratory, which is not unusual.

Q Okay.

A Because, you know, soil classifications are called unified soil classifications in engineering. But in sedimentology or in sedimentation, you have a different classification scheme.

Q Okay.

A The unified soil classification is based upon strength of material, while a geological description would be based upon the lithology itself and what the environment of deposition was. Well, this is probably a unified soil classification effort.

Q And so how is that -- how is that different? How would that reveal --

A Well, you're describing -- you're describing a soil that -- and that's not really a soil. It's a substrate, but they call it soil, everything from there to the center of the earth -- engineers do, but that's

not the case. It's primarily -- you have to actually take a penetrometer and push it into the core and see what it reads, and that means how strong is the soil? What will it support? Will it support a dam or will it support a foundation, something like that. Well, geologists don't care about that.

Q Okay.

A They care about the lithology itself and the details of lithology and what type of depositional environment that it was laid down.

Q I see. And you -- and how does the geologist then determine the classification of the soils or --

A Well, if I was there, I'd have a table sitting out there or a trailer with a microscope --

Q Uh-huh.

A -- and look at every foot.

Q As you described earlier?

A Yes.

Q Now, you mentioned that there's also Leona present or the Leona is exposed.

A Well, they describe gravel here.

Q Uh-huh.

A Very coarse.

Q And is that consistent with your understanding --

A Yes.

Q So can you tell me about the Leona?

A The Leona is a Pleistocene-Pliocene, very high, high rainfall flooding event that washed away all the limestone, dissolved it where it came off the Texas Hill Country. And it's very extensive. I would imagine that we have over a hundred inches of rainfall a year to deposit those very high energy, very -- very high -- big cobbles. And what that energy was, the Balcones Fault system was uplifted and the huge amount of flooding during the Pleistocene-Pliocene but mostly Pleistocene -- we had enormous amounts of rainfall. And the rainfall has deposited a lot of this gravel. In fact, I live on a creek where the gravel is present, although it's present without the chert -- this is all chert -- which means that the limestone is completely dissolved out by the time it gets to this point, and it's a chert pebble conglomerate. It's very large, very coarse grain material.

Now, the weathering profile of what's called a chernozem soil has incorporated some of this Leona with it. In other places it hasn't, so the soil itself is -- even though it's a chernozem soil, which is a black, organic soil, incorporates the Leona gravel within the -- within the soil itself.

So sometimes the soil is not described as Leona, but it is Leona. And it's been described by the Bureau of Economic Geology as Leona.

Q Because of the presence of the Leona gravel?

A Yes.

Q And what is -- what is your understanding of the presence and the extent of the Leona in the area of the reservoir and the --

A Well isopaching the latest core is -- it extends to the west a little more than what's been mapped by the Bureau of Economic Geology. I think it was a number -- I don't know which one was the most northwesterly one core. I can't remember what it was, but it had Leona in it.

As I understand it, Leona was not described in the original report.

Q And the basis for your understanding of the extent of the Leona that is --

A It's based upon the cores.

Q Okay.

A The most recent cores, and the description that was submitted to me, because I wasn't there.

Q Right. So have you had any site visits to the area of the proposed landfill?

A No.

Q Okay.
A I have recommended drilling two additional core holes --
Q And where would you --
A -- within the easement.
Q Okay. Within the easement? And the purpose of that would be?
A To define the Wilcox. And two is the minimum. There are some oil and gas wells to the north, and they also indicated the presence of the Wilcox despite the fact that most -- most of it was cased off. And I furnished those to you, those logs.
MS. PERALES: Okay. Can we take a short break?
THE VIDEOGRAPHER: The time is 11:35 a.m. We're off the record.
(Recess: 11:35 a.m. to 11:42 a.m.)
THE VIDEOGRAPHER: The time is 11:42 a.m. We're back on the record.
MS. PERALES: Can I get this one marked?
THE REPORTER: And that will be 2. Correct?
MS. PERALES: 2.
(Exhibit No. 2 marked)
Q (BY MS. PERALES) So, Mr. Wilson, do you

recognize the document that's been handed to you and marked as Exhibit 2?

A Yes.

Q And what is this document?

A It's a surface geologic map of the reservoir -- reservoir overlying the Wilcox and the isopach of the Leona within the footprint of the proposed landfill.

MR. RYAN: Excuse me just for a second. Bob, is that among the stuff that y'all --

MR. ROBERT WILSON: I think it must be.

THE WITNESS: What?

MR. ROBERT WILSON: I think it is, but I'm -- I can't -- I don't know if it's --

UNIDENTIFIED SPEAKER: That's NRCS. Right?

MS. PERALES: Yes.

MR. ROBERT WILSON: It's something we prepared. I know that. So why don't you show it to him, because this is something that --

THE WITNESS: Oh, I prepared from the last cores -- the last cores to --

MR. RYAN: Oh, so you haven't produced it to us in discovery if it's that new.

(Simultaneous discussion)

MR. RYAN: You haven't given us anything

in months.

THE WITNESS: Actually, I think I -- I think I gave this to Marisa the last meeting we had last week or something, didn't I? Yeah. I'm not sure. I've had it -- actually, we did -- this was sent to somebody, emailed to --

MR. ROBERT WILSON: Daniel emailed it to somebody, but I don't know who he emailed it to. I don't know who all he emailed it to. My apologies if --

MR. RYAN: No, that's okay.

MR. ROBERT WILSON: -- didn't have it --

THE WITNESS: You see the --

MR. ROBERT WILSON: -- but this is something that Feather prepared himself --

MR. RYAN: Right.

MR. ROBERT WILSON: -- based upon --

THE WITNESS: You see the Goliad 1, 2 and 3 King and the Goliad Hunter-King? Well, everything but the Hunter-King actually -- 700-foot of casing through the Wilcox, but you can see the beginning of the Wilcox as the curves begin to show up as Wilcox in three other wells. The third -- the fourth well is -- casing was set too deep.

You can notice that on the other side, the west side of the reservoir, there's a Wilcox outcrop

that had been mapped by the Bureau of Economic Geology. And then to the north it's covered by -- by quaternary alluvium, which is really not very thick. But below that -- Goliad at 3-King appeared to have about a hundred feet of Wilcox.

So the Wilcox underlies most of the reservoir itself. It's adjacent to the footprint of the -- of the berm -- I think where the berm is going to be put. I'm not sure. But if you -- but the toe of the berm is also critical because of the Leona. Now, if you remove all of that Leona and shove it off to the west or truck it off, that's going to be extremely expensive to do, extremely expensive.

And that's why --

Q (BY MS. PERALES) Is that necessary?

A Huh?

Q Do you think it's necessary though to remove all of the Leona?

A To re-ensure the integrity of the berm, yes, I do.

Q Let me back up a little. I had asked if you could identify Exhibit 2, and I think that you were interrupted. So could you tell us what Exhibit No. 2 is?

A It's a geologic map.

Q All right. Did you prepare this?
A Yes.
Q What information did you use to prepare this?
A Bureau of Economic Geology GIS files.
Q And do you --
A And the isopach, though, is from the cores themselves.
Q Okay. Great. And when you say "from the cores themselves," you're talking about the information that was produced related to the borings that were --
A Second -- second go-around.
Q The second go-around.
And you also mentioned the -- the Goliad King wells. So were you looking at information related to those wells?
A Yes. You have the logs.
Q Uh-huh. And those logs formed part of the basis for the preparation of this document?
A Excuse me?
Q Did those logs -- were those also part of the basis for the creation of this document, of Exhibit 2?
A Well --
Q Well, the location of --
A The location, yes, is correct. Goliad Hunter-King though is not -- is not part of the analysis

because there was -- there was too much casing set.

Q Uh-huh.

A And if you'll notice, I also recommend two more drill sites within the reservoir itself. Well, in order to verify the sands within the Wilcox, I think those locations were necessary.

Q And those are the ones that are marked with drill site and then a question mark?

A Yes. See drill site with a question mark? In fact, I would prefer more of those, but, you know, I recommended two for -- because the PCCD -- you know, EPA usually goes after the -- for cleanup after the owner or responsible person and, you know, PCCD could end up as a responsible party. So we need a baseline. You know, a base -- a geochemical baseline as well as sedimentological baseline, and we don't really have one.

Q When you say "responsible party," you mean if the landfill were to fail, the liner were to fail --

A Or there was -- there was a leachate -- you know, contaminant pathway or something like that as I described before. I believe that it would be the responsibility of the operator to drill those holes in order to preserve a baseline for themselves. Because if they don't have one, they're liable to become a responsible party since this is an option on the land

that they're going to purchase. CERCLA, I think, if it becomes -- it would become involved and I believe that's CERCLA's -- they go out after the -- they go after the -- first the operator. And then if the operator is not around or has no money, they go after the landowner. And in this case, since PCCD controls this area with an easement, which is the dominant -- is that right, Bob -- it's the dominant piece of real estate? They would become a responsible party.

Q That's your concern. Right?

A Huh?

Q That's your concern is that the PCCD could become the responsible party, and that's why you would like --

A Yes, they could, you know, potential for that. You know -- I mean, there may be other parties involved, but because they own -- they have the easement and the easement is the dominant piece of real estate -- is that right, Bob --

MR. ROBERT WILSON: It's callid the dominant estate.

A -- dominant estate, then they could become the responsible party for cleanup.

Well, in order for the -- but you have to have a baseline. In other words, we would have to right

now -- or the operators would -- go in and take sediment samples and water samples and -- with transects in order to establish that baseline, because there already could be contaminants in there. We know what -- we'd know what they are.

And so I think that would be a very important step and prudent step for the operator. You know, it costs a lot of money, but --

Q Right. So going back to Exhibit 2, so that the record is clear, can you describe -- first, can you describe what the red line is intended to convey?

A The red lines, these are ownership lines. The owner -- these are parcels, county parcel map.

Q Okay.

A And I'm not sure -- I think -- I'm not sure how far the parcels go with the land that's owned by this lady, I guess, but -- so it's just a parcel map.

Q Okay. And the area that's shaded in kind of a speckled yellow, what is --

A That's the Leona.

Q That's the Leona? Okay.

A Uh-huh.

Q The area in blue?

A That's the reservoir.

Q And then the --

A Approximate easement of the reservoir.
Q Okay. And then the area that's kind of an orange color --
A That's the Wilcox.
Q -- that's the Wilcox. Okay.
A And the -- the area to the west says EMI. You see that little EMI? That's the Midway.
Q Okay.
A And then the small yellow -- actually, the yellow is very similar to -- that's not just -- that could be Midway, but it's probably alluvial material, which would be above the Leona, which is recent alluvial material.
Q And where is that?
A That's up where the Goliad -- Goliad No. 3-King --
Q Uh-huh.
A -- I don't -- I believe that's not Midway. That's quaternary alluvium. I'd have to go back and check my maps though. This is a GIS map that I maintain over a big area.
Q Okay.
A My purpose of making this map was the isopach of the Leona.
MS. PERALES: Can I get this marked as No.

3, please?

(Exhibit No. 3 marked)

MR. RYAN: Are there three different -- are there three things here?

MR. RUBINOV: No, those are -- these are the same. I'm sorry, I may have just given --

(Simultaneous discussion)

A Is this the only log you're going to ask me about?

Q (BY MS. PERALES) It's the first log I'm going to ask you about.

(Laughter)

Q (BY MS. PERALES) So can you identify this document that I've handed you?

A This is the Goliad No. 3-King geophysical log.

Q And so the Goliad King -- 3-King geophysical log, does this correspond to the -- what's been marked as Goliad 3-King on Exhibit 2?

A Yes.

Q So that's -- the log is from that location that's shown on the map?

A Yes.

Q And what is it about this log that was significant to you?

A Well, there's two things about it. Look at the

base, say one inch equals 100 scale right below the lines where it says "redistributed conductivity and spontaneous potential." Do you notice that the resistivity curves on the right-hand side of the log actually begin to move to the -- to the right? Do you see that, moving up like that?

Q Uh-huh.

A Well, that's due to the fact that this is near the base of the Wilcox. And once you get up into the Wilcox, you start seeing more sand. But because of the sand, the Railroad Commission wants you to case off productive water sands, so that's what they did here.

Now, looking at down the hole --

Q So can I just finish that thought so I'm sure I understand what you're saying? So you see some sand near the top, and then it's cased below that?

A Well, you don't -- the sand is cased off.

Q Okay.

A But there's indication from the way the curves are shaped to where there's more resistivity and not less resistivity. That's an indicative of the base of the Wilcox.

Q I see. Okay. And you were going to say something else?

A Huh?

Q Were you going to say something else --
A No.
Q -- with regard to their log?
A I just work here.
Q Okay.
(Laughter)
Q (BY MS. PERALES) Okay.
(Exhibit No. 4 marked)
A This is the Goliad No. 2.
Q (BY MS. PERALES) So this is Exhibit 4. And Exhibit 4, what is -- what is this document?
A Its another geophysical log of the Goliad No. 2-King -- yes.
Q And this log, does it correspond to the location that's identified as Goliad 2-King on Exhibit 2?
A Yes.
Q And is there anything significant that you gleaned from this?
A Yes. From about 110 feet -- about 110 to 120 feet, you'll notice that the scale on the right-hand side, resistivity scales, move to the right. Now it even indicates at the very base of the resistivity and conductivity labels that that is a sand. Now, when you look over on the left-hand side, that's called a

spontaneous potential, two electrodes, one on the surface and one downhole. And in freshwater, that curve is subdued. It really is not indicative -- if you use a gamma ray curve, you might see that that is a sand. The sand is indicated on the -- on the resistivity curve, but on the SP curve, because it's freshwater --

Q Uh-huh.

A -- it doesn't register -- in other words, it's not a contrast between saline water and freshwater. This is all freshwater.

So looking down the hole, let's go to 1800 feet and look at the SP down at 1800 feet. You can see it's quite pronounced. Right?

Q Yes.

A Well, that pronunciation is due to saline water.

Q Okay.

A And you come back up and you look on the right-hand side, you'll see that that is a very low resistivity, very porous section. As you go up the hole, you start losing resistivity, but that's probably due to other lithology such as chalk, because that's the top of the Edwards.

And the Midway is exposed down to -- I would say the top of the Navarro is at 720, 720.

Navarro is -- you could look at the curve of the SP curve, and you can see the -- the SP curve in the Midway is more serrated than it is in the Navarro. Notice that? You know what I mean by --

Q If I look at what --

A The SP curve over on this side.

Q Uh-huh.

A That serration is due to incorporated silt.

Q Okay.

A While the Navarro is more of a pure weathered volcanic ash from Mexico, Eocene, about 40 million years old. It doesn't say that on the log though.

Q Okay. Yeah.

(Laughter)

A How many logs do you have? I think only had three.

Q (BY MS. PERALES) Okay. I only have one more.

(Exhibit No. 5 marked)

A Goliad King No. 1 -- or Goliad No. 1 -- King.

Q (BY MS. PERALES) So Exhibit 5 you said that was the log for the Goliad 1-King. Is that right?

A This particular log really is almost -- it's a 200 feet -- I mean, the casing was set at 170. So this is entirely within the Midway. But notice -- notice now down around 700, 800 some of these serrations?

Q Uh-huh.
A Those are silts and -- silty -- clay silts. So -- and these -- notice these spikes on the right-hand side --
Q Uh-huh.
A -- of the resistivity? Those are silt zones that are, like, 2 inches thick, but you can't -- you can't see them. You can on new logs. We have 2-inch electrodes on new logs. But these logs were -- when were they taken? 1994. That's old.
Q Okay.
A I mean, there are hints that -- that what the core showed in the Midway with silt zones are also shown on -- at least the resistivity side of these logs -- that they verify the silt, which I don't -- it to me is not significant anyway, but --
Q Uh-huh.
A -- as far as contaminant pathway.
Q Okay.
A I'm just saying that the cores do verify what the logs show.
Now if I had -- if I hadn't had 56 years of experience, I probably wouldn't notice.
(Laughter)
Q (BY MS. PERALES) Okay. So -- and just so

we're clear, there's a Goliad 1-Hunter-King and a Goliad 1-King on Exhibit 2, and we were looking at Goliad 1-King. Is that right?

A Yes, and there's a Goliad numbered Hunter-King, and it's all -- I don't think you have it.

Q I don't think I do.

A And, see, it was set -- the casing was too deep to look at the Wilcox -- any indication of the Wilcox.

Q Okay.

A That's another reason I want -- I'd like to see some core holes drilled within the area where the reservoir is usually dry. I think that's very important for the baseline, for the geochemical baseline, and the lithologic baseline. But nobody has offered to pay for them, and I'm not going to pay for them.

Q Are you aware of any historical gravel mining that's occurred within or near the proposed landfill facility?

A In the Leona?

Q Uh-huh.

A Yes, there are gravel pits in Lockhart, near Lockhart.

Q Okay. What about near the proposed landfill? Do you know of any gravel mining that's occurred there?

A No. The landfills I'm associated -- know about

is the BFI and Waste Management.

Q I'm talking about this -- this proposed landfill.

A This one? No.

Q Okay. So the gravel mining that you're aware of is near Lockhart. Is that right?

A Yes. The Leona -- this is an isolated portion of the Leona. When you go over to the southwest, the Leona is a huge area. It goes all the way from the Balcones Fault system down to Lockhart, continuous. And it is an aquifer, and it's polluted by nitrates from fertilizer. So you don't want to drink the water from Leona -- or especially babies.

But the Leona is a significant aquifer all -- from Hondo which is just south of here, all the way to this area. And in the Hondo area the Leona is -- is saturated with water from produced Edwards water, and it's now become a major aquifer because of that. So it's a real interesting formation.

Oh, I didn't make this -- I didn't make the Bureau map.

Q Right.

A Even though I worked for the Bureau and mapped some, I didn't make this map.

Q Okay. So we've talked about your concerns

related to -- to the risks of contamination that might come through the landfill --

A Assuming the Leona is incorporated into the berm.

Q Because the Leona would be -- the Leona is what's present at the site. Is that right?

A It -- it could potentially create pathways, contaminate pathways, particularly if you're going to put it into a berm. The first thing you're going to do is push the top over first. That means it's going to be at the base of the toe of the berm. Above that there's going to be clay. So the base of the berm is far more contaminant sensitive --

Q Uh-huh.

A -- than the top of the berm, unless the berm gives way, you know, a catastrophic rainfall event.

Q Uh-huh.

A So the Leona itself, if it -- under ideal conditions and I was in charge of the world, I would completely remove it before it gets to be placed in the berm.

Q And just to be clear, is Reservoir 21 -- is that downhill from the proposed landfill?

A Which one?

Q Reservoir -- the Reservoir 21, is that downhill

from the proposed landfill?

A Yes, it's very -- very close to where the berm, I think, is going to be built. But I don't -- you know, I'm not the expert on where the berm is going to be placed. But I understand -- I think from one of your experts -- that the toe of the berm would almost contact or be in contact with our easement.

MR. ROBERT WILSON: If they build it, we'll find out.

(Laughter)

A That's a good point.

Q (BY MS. PERALES) Thank you.

A You know, the hogs, the rodents, the smell, none of that is of concern to me.

(Laughter)

A The only concern I have is the geology.

Q (BY MS. PERALES) Okay.

A The esthetics...

Q And you've talked about the suitability or unsuitability of the soils and how the Navarro would present a much more suitable --

A Absolutely --

Q -- location?

A -- no question.

Q So related to the -- so -- so my takeaway is

that the proposed location is not a suitable location for the site because of the various sediments and the geology?

A I made the statement long ago that it's not the best site for -- for a landfill because of its proximity to the outcrop of the Carrizo -- I mean of the Wilcox, and -- and the fact that it's overlain by Leona.

Q Okay.

A You know, if it was totally within the Navarro, not adjacent to a lake or a -- a watercourse, major watercourse, I mean that -- that would be the more ideal piece of real estate to go after in deference to this one.

Q And that -- one of my questions was so the presence of the reservoir, that's also a factor regarding the suitability or unsuitability of this proposed landfill?

A Yes.

Q What about the -- what about the condition of the dam and the fact that it's a high-hazard dam. Does that -- does that factor into your opinion as well?

A Well, if you make the assumption that it becomes polluted and the dam fails, washes down into people's yards, that might not be too -- too fun for them. You know, all this is hypothetical, but --

Q Uh-huh.

A -- you know...

Q So I want to go back to some of the areas that I didn't finish asking you about. And one of them was what kind of work were you doing in South America last year?

A I was working on a petroleum concession in Paraguay, but I went to Columbia because of the -- that's where the office was. And this was all Paraguay and a portion of Bolivia and a portion of Argentina and a portion of Uruguay and a portion of Brazil, because the entire country was -- was -- I've been looking at the entire country as a prospect for a British firm to -- to actually enter that exploration arena in search of an Devonian shale play, which is a -- similar to the shale play of Eagle Ford and Bakken and the Barnett.

Q Uh-huh.

A It's all the same shale. And these were giant fjords out in front of the sub-Andean fold belt that were 11,000 feet thick of petroliferous shale. The British firm wasn't very well funded. They did pay me, but to be able to do something like this, the first well would cost $23 million and they already had 40 million in it. So they decided not to do this. And I was hired to evaluate it.

Q Okay. And so what did you do as part of your evaluation?

A I looked at all the available geology plus all the wells that had been drilled in that area and made maps and isopach maps and et cetera, just a general petroleum exploratory overview.

Q Okay. And is that typically the first step in -- in analyzing --

A Yes.

Q -- or characterizing the subsurface?

A I have mostly been involved in my career in what's called frontier exploration, which means outside the -- really the purview of -- of development. I'm not a development geologist. I'm an exploratory, frontier exploration geologist, at least in the oil industry.

Q Uh-huh. So when you talk about the fronter geology, would it be fair for me to say that what you're doing is you're collecting the available data to create a conceptual model?

A Yes.

Q And then if you had moved forward, then that's when you would be out on the site looking at soils and --

A If they drill a well, yes.

Q Okay. And that's how you would prove up your

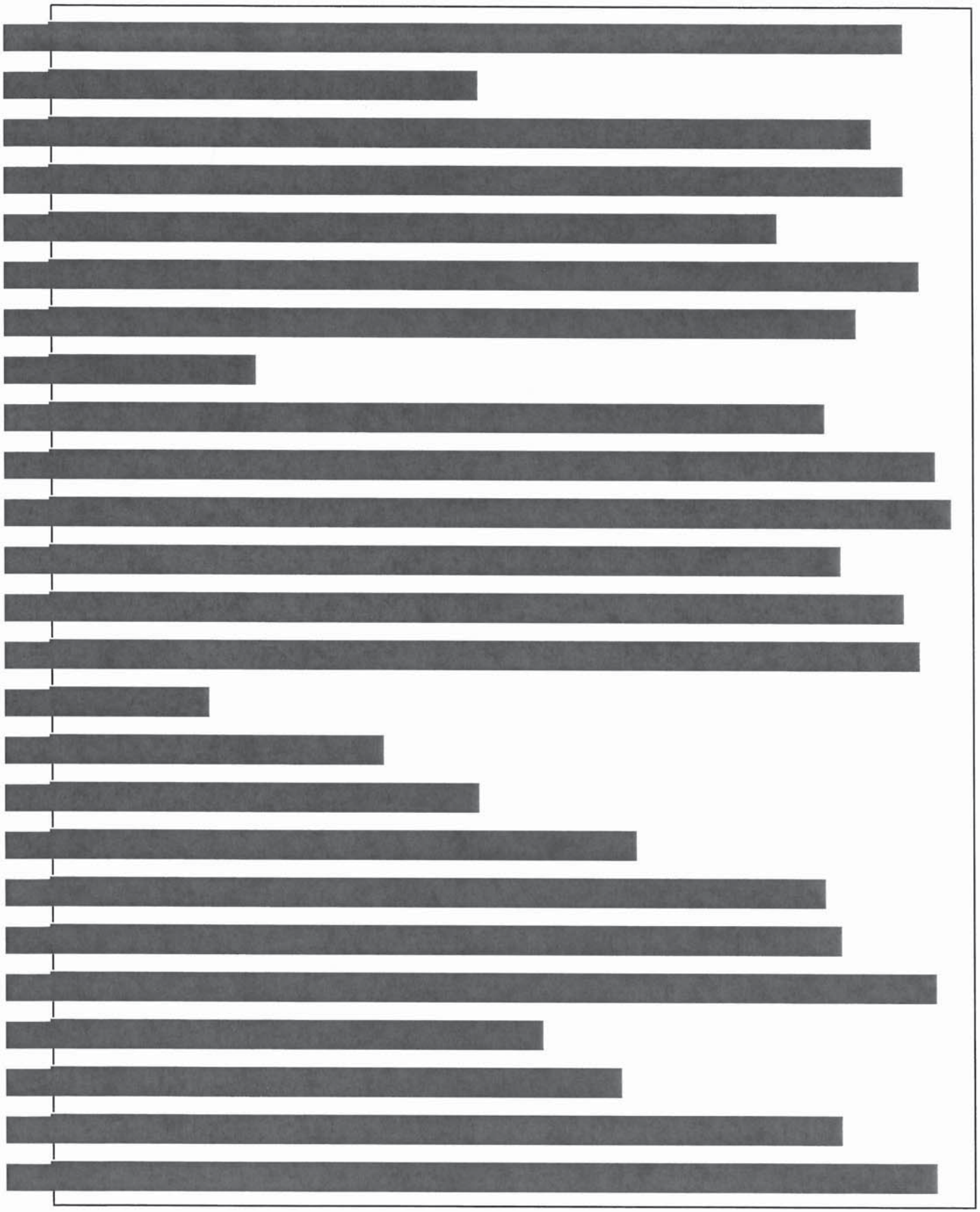
conceptual model?

A Well, in this case of Paraguay or Bolivia or some of those places, I probably would allow somebody else to do that --

Q Uh-huh.

A -- under my supervision.

Q Okay.



Q I was going to say, I'm going to have to bring us back to something more boring.

Let's see. So I understand your concerns related to the reservoir and the Wilcox, can you tell me -- the Wilcox, is it a sole-source aquifer?

A Well, you can consider that for the county because it is the only aquifer that PCCD -- that's a freshwater aquifer except for the alluvium, which is very minor, for the county -- or PCCD anyway.

Q Okay. So I gathered from your testimony that -- that geotextiles, the liners, they do crack?

A Uh-huh.

Q What is the basis for your -- that information?

A Just observation. But if you want to go on the Internet and put in cracked liners or -- you'll find pictures of them, and there are a lot of pictures of how

liners fail, especially around the edges of the liners. They rip.

Q Uh-huh.

A They can devitrify from sunlight. They can devitrify from solvents.

Q Solvents that you would find in solid waste?

A In paints and things like that. It's -- solvents are an unknown contamination problem for liners, as well as clays. It will actually dry up the clays.

Q You also talk about how you've maintained your field notes for, well, indefinitely. I don't have -- let's see, I don't have a clear understanding of how long you maintain samples that you've collected.

A Oh, as long as there's any question about them.

Q So if you were involved in litigation and you had collected soils samples related to that litigation, would you maintain the samples at least through the end of the litigation?

A They'd be sitting in my barn.

Q Okay. And why is that? What is the --

A Well, they're evidence. It's evidence. It would be unethical for me to destroy those samples.

Q Would you -- would there be any occasion or reason for you to refer back to those samples as you

prepare for your --

A Sure.

Q Okay. As you prepare for your testimony, you might go back and look at those?

A Yes.

MS. PERALES: Okay. I think -- short break?

THE VIDEOGRAPHER: The time is 12:21 p.m we're off the record.

(Recess: 12:21 p.m. to 12:23 p.m.)

THE VIDEOGRAPHER: The time is 12:23 p.m. We're back on the record.

MS. PERALES: So that concludes my questions for you. I guess I'm not passing the witness; it's not a deposition. So thank you.

THE WITNESS: Thank you.

(Laughter)

THE VIDEOGRAPHER: Time is 12:24 p.m. We're off the record.

C E R T I F I C A T E

STATE OF TEXAS)

COUNTY OF TRAVIS)

I, Lou Ray, Certified Shorthand Reporter in and for the State of Texas, do hereby certify that the above-mentioned matter occurred as hereinbefore set out.

I FURTHER CERTIFY THAT the proceedings of such were reported by me or under my supervision, later reduced to typewritten form under my supervision and control and that the foregoing pages are a full, true, and correct transcription of the original notes.

IN WITNESS WHEREOF, I have hereunto set my hand and seal this 27th day of June, 2016.

Lou Ray

LOU RAY
Certified Shorthand Reporter
CSR No. 1791 - Expires 12/31/17

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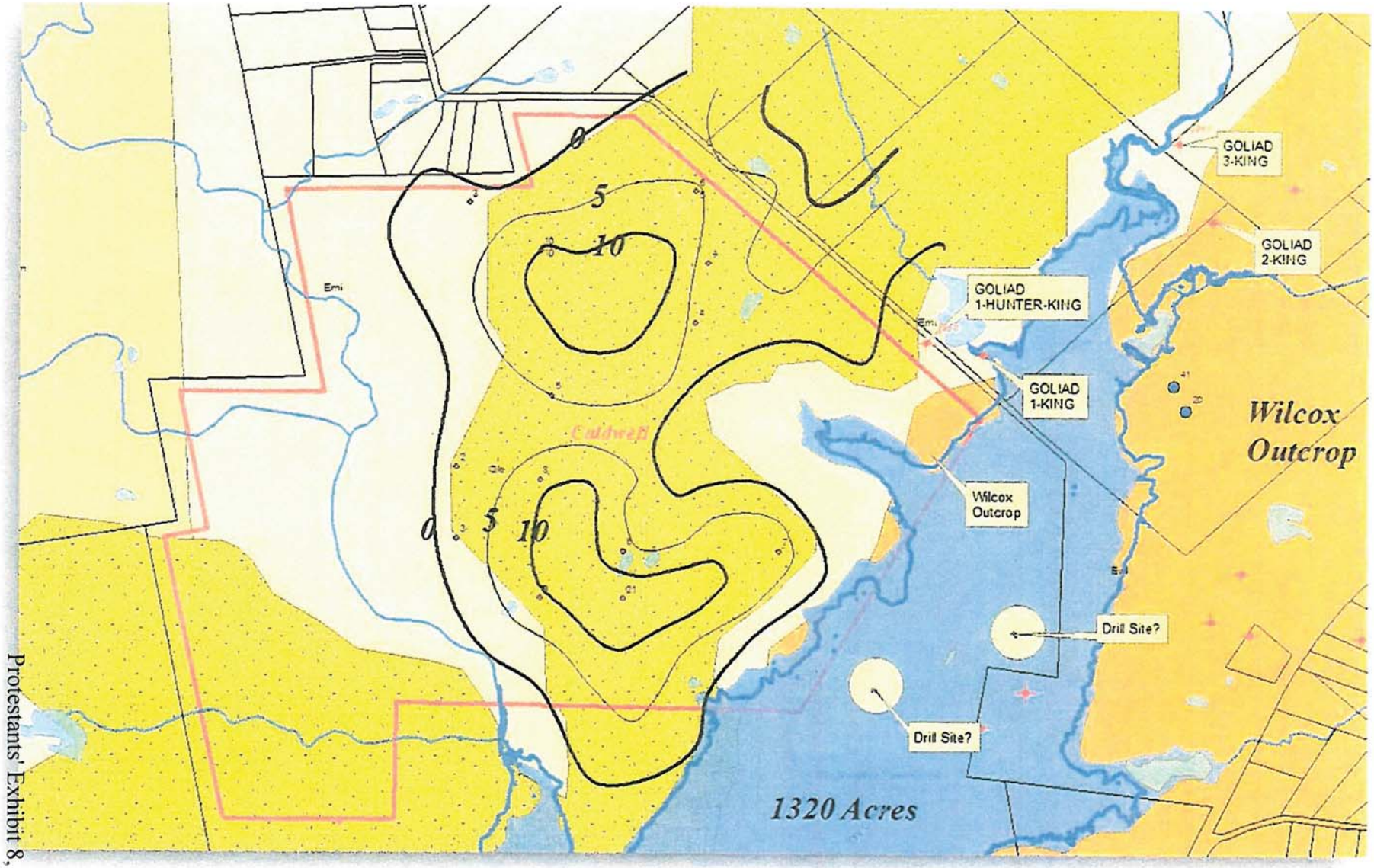

Protestants' Exhibit 8, p. 72

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