TRANSCRIPT OF PROCEEDINGS BEFORE THE
STATE OFFICE OF ADMINISTRATIVE HEARINGS
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
AUSTIN, TEXAS

APPLICATION OF WILLIAMSON	) SOAH DOCKET NO.
COUNTY FOR A PERMIT AMENDMENT	) 582-06-3321
TO EXPAND A TYPE I MUNICIPAL	) TCEQ DOCKET NO.
SOLID WASTE LANDFILL FACILITY;	) 2005-0337-MSW
PERMIT NO. MSW-1405B	)

HEARING ON THE MERITS
FRIDAY, AUGUST 24, 2007

BE IT REMEMBERED THAT at 9:04 a.m., on Friday, the 24th day of August 2007, the above-entitled matter came on for hearing at the State Office of Administrative Hearings, William P. Clements, Jr., Building, 300 West 15th Street, Room 407A, Austin, Texas 78701, before HENRY CARD AND TRAVIS VICKERY, Administrative Law Judges, and the following proceedings were reported by Evelyn Coder and Patricia Gonzalez, Certified Shorthand Reporters of:

Volume 5 Pages 838 - 1043

Page 839

P R O C E E D I N G S
FRIDAY, AUGUST 24, 2007
(9:04 a.m.)
JUDGE CARD: Let's go ahead and get started. I know one issue -- one preliminary issue we had was stipulation about some of the protestants' testimony. Mr. Riley?
MR. RILEY: Good morning, Judge Card. I have not heard anything from the protestants regarding any -- I've seen Mr. Arnett arrive this morning so I assume that Mr. Arnett will be called and testify live as to his prefiled testimony, and at that time, I suppose we'll deal with any bolstering or friendly cross-examination issues if there's any attempt at that. I'm not suggesting there is, but we were not offered any stipulation or request for clarification. So we're at a loss in terms of new information.
MS. PERALES: I asked Mr. Arnett to come this morning only because I hadn't had a chance to talk with Ms. Fox and Dr. Evans about whether or not they had any cross-examination. I thought we could take that up during the break, and if not, we'll let Mr. Arnett leave.
JUDGE CARD: Okay. That sounds fine. Any other preliminary matters before we continue with

Page 840

Mr. Cravens?
(No response)
JUDGE CARD: Okay. I believe we're ready to begin Ms. Perales' cross. Please go ahead.
PRESENTATION ON BEHALF OF THE APPLICANT
(CONTINUED)
PAUL B. CRAVENS,
having been previously duly sworn, testified as follows:
CROSS-EXAMINATION
BY MS. PERALES:
Q Good morning, Mr. Cravens.
A Good morning.
Q My name is Marisa Perales, and I represent two of the protesting citizens groups in this matter, and I have a few questions for you this morning.
As an initial matter, could you tell me which parts of the application you are here to sponsor or testify about?
A Particularly the geotechnical report, which is in APP-202 starting on Page 320.
Q And is that it?
A No. Then there's a number of slope stability evaluations that are technical reports that are in a different volume. They're also under APP-202, and

Page 841

they start at 1584.01. They go through 1851, not including the technical printouts.
Q Did you discuss that in your prefiled testimony?
A I did. I did in -- I don't recall if I did in prefile. I did in deposition.
Q Okay. And I guess I wasn't at your deposition.
A Okay. There may be other matters that relate to this; boring logs, data tables, sort of scattered throughout the documents, but these are the primary matters that I'm testifying to.
Q Okay. Well, I don't have questions for you on the slope stability analysis as I didn't see it in your prefiled testimony, so we'll stick with the geotechnical report.
Can you explain to me -- I know this is a very basic question, but can you kind of give me a basic purpose for the geotechnical report? What is it intended to tell me?
A Well, the geology report gives you an idea of the overall existence of geologic units at the site. The geotechnical report really addresses the engineering characteristics of those geologic units, especially as they would be needed to be understood

Page 842

for the design and construction of a landfill.
Q And is one of the things that I should be able to glean from your geotechnical report the hydraulic conductivity of the soils and stones underlying the site?
A That would be geotechnical data that would fit into several parts of the permit application. As it applies to geotechnical characteristics, it's just one of them.
Q Okay. That's part of your report. Is that correct?
A Yes, the laboratory permeability tests were.
Q So hyrdraulic conductivity and permeability, those are synonymous?
A For our purposes here today, they're interchangeable.
Q Okay. And could you tell me, like, a basic definition of hydraulic conductivity?
A It's a measurement or a characterization of a material's ability to transmit water through its matrix.
Q And how is it expressed?
A Typically in centimeters per second.
Q Is hydraulic conductivity -- is that a component of what I've heard of as Darcy's Law?

Page 843

A It is.
Q Can you explain what Darcy's Law is?
A It's a formula, a very old one, that tries to tie in -- or ties in the difference in height of a water-bearing unit, the top to water, so a gradient, and it tries to tie it into the characteristics of the soil or rock, which is the permeability, and it's an expression of the flow that you would get out of such a unit under those conditions.
Q So Darcy's Law is intended to give you flow as in volume of flow?
A I'm not a hydrologist so I have a basic understanding of Darcy's law.
Q So do I.
A Good. Then we're equal then.
Q Then I kind of flipped through some of the data that was in this application, and I want to make sure I'm understanding it as it should be understood.
A Okay.
Q So can we start on Page 958.01 of Volume 3 of the application?
A Could you say that page number again?
Q Sure. It's 958.01.
A Okay. Yes.
Q And there are two lines -- I guess these are

Page 844

the descriptions of the data that's reflected to be on this page.
A Are you on 959 now?
Q 958.01.
A I've got a title page there.
Q Right. Okay. So it says Coefficient of Permeability. Is that what we were talking about when we were talking about hyrdraulic conductivity?
A Coefficient of permeability is the ASTM term for a test that eventually gets you that number.
Q Okay. So ASTM -- you said that this is a test. Is that right?
A It's a laboratory test.
Q A laboratory test. And I presume there's more than one sort of laboratory test to determine permeability?
A There are, yes.
Q And is this a generally recognized permeability test?
A If it's ASTM, it is, and flexible wall -- yes, this is the most common one.
Q Do you know if it's referenced in the TCEQ rules?
A I don't know that.
Q Okay. So, again, I want to make sure I'm

Page 845

reading this data correctly. Could you turn with me to Page 966?
A I would like to correct that. Simply because -- I tend not to memorize standards numbers because they all get jumbled after awhile. There are ASTM standards in the rules, and there was one that I reviewed back and forth that was specific. It may be this one, it may not.
Q Okay.
A I'm sorry. What page?
Q 966.
A I'm there.
Q So looking at 966, up at the top where it says "Sample ID," do you see that?
A I do.
Q And then it says "E-4D." Do you see that?
A I do.
Q Is that -- if I turn to the rock core logs that we were discussing with Ms. Gallup yesterday, would E-4D -- should that reference one of the rock core logs that's labeled E-4D?
A It would reference either a rock core log or a soil coring, and I'm not sure which it would be.
Q Can you turn with me -- keep that page. Like, mark it or something, if you will.

Page 846

A Okay.
Q And then could you turn to Page 472?
A I am there.
Q At the top there, in the right-hand corner, it says, Boring No. E-4D. Do you see that?
A I do.
Q That core log that says E-4D, is that's what's referenced on Page 966 of the permeability data?
A It appears it is.
Q Okay. Good. So could you turn with me then to Page 967?
A Okay.
Q That one appears to have sampled E-11. Is that right?
A That's what it says, yes.
Q And the numbers in parentheses right next to E-11 where it says 40.5 to 41.6, is that the part of the -- does that reference a part of the log or the core that was sampled?
A It should represent the interval that was wrapped or secured and was pulled for sampling.
Q Okay. So could you turn with me now to Page 516 and keep your finger on that other page?
A I'm there.

Page 847

Q At the top there, it says Boring No. E-11. Do you see that in the right-hand corner?
A I do.
Q So is this core log -- is it the one that was sampled for your permeability data?
A It appears it is.
Q So if I went in this core log down to the interval between 40 and 45, is that where I might find the description of the core that you looked at for your permeability data?
A That's correct.
Q And between 40 and 45, that part of the core is described as claystone, weak to moderate, pale yellow with trace brownish yellow, iron staining and so forth. Is that accurate?
A That is accurate.
Q But then if I go back over to Page 967, it appears to describe the core as light brown silty clay. Is that right?
A That's correct, it does.
Q Are those -- are those consistent?
A That's a -- on the surface, probably not. It's a shorthand that's used in the laboratory. The real identifying -- identifying numbers that you want to go by are the sample ID and then the location which

Page 848

tells you where within the sample.
The sample is basically subdivided in order to create a core for the test, and then in order to get kind of a general description. So you're running a bunch of these things in the lab and you've got some dark grey stuff, you've got some light tan stuff, and it really is more for the laboratory person to not mix them up, you know, on quick inspection.
Q I see.
A It's not meant to be an accurate description of what the material is in the boring log.
Q Okay. So I shouldn't rely on the descriptions in the core log and in these permeability data to get an idea of what it looks like?
A Right. You would want to go back to the boring log every time.
Q Okay. So in E-11, it says that sample was from 40.5 to 41.6, so that's roughly about a one-foot sample. Is that right?
A Correct.
Q And then if I go back to Page 516 and I read the rock description there, it appears that there were fractures in the interval between 40 and 45, but those fractures started at 42.4 and 44.1. Is that right?
A The logged -- first logged fracture is 42.4.

Page 849

Q So the sample that you looked at, which extended to 41.6, that sample did not include fractures. Is that fair?
A If it included fractures, it wasn't logged as having them, so it indicates it did not.
Q Okay.
A I'm sorry. I need to read all the way through. In the first description, it just says "slightly fractured," and then it describes a specific fracture.
But the way, I didn't log these in myself.
Q Right.
A So I did not eyeball these. So please let me look at this again.
Q Okay.
A Okay. I'm satisfied with my previous answer.
Q Okay. And then staying on Page 967, where it says in that box "test data," there's a word there, "Permeant," and then next to it is "de-aired tap water."
A That's correct.
Q Could you explain what that means to me, please. Is that what was -- de-aired tap water, is that what was used for the sampling process or your

Page 850

analysis?
A That's correct.
Q Okay. And then you have -- in that same box, you have "gradient, 41.9." Is that a gradient that was created at the lab?
A That's correct.
Q Because 41.9 wouldn't exist out in the field. Is that right?
A It would at a -- I haven't checked these calculations, of course, but it would at depth. You could have a high pressure at depth because of the overburden of the soil above it.
Oh, but would you have that value?
Q Right; exactly.
A No, that's very high.
Q Right. Okay. I thought I heard Ms. Gallup describe gradients in the field at less than one. Is that fair?
A I don't remember her saying that.
Q Okay. But does that sound like it's more consistent with what you would find out in the field, less than one?
A What units are you using?
Q Whatever units we are talking about here -- feet per feet.

Page 851

A Feet per feet, okay. So that's a different gradient. So perhaps it would be useful if I describe this test as being an attempt to move water through this in a controlled fashion where you're taking measurements the whole time, and you know all the conditions in the laboratory.

So for this particular test, you're not trying to duplicate what's in the world. You're trying to take a really fairly impervious material, and you're trying to within weeks, instead of years, move some water through it.

Q I see.

A So having this kind of a gradient is -- it's an artificial gradient, but it's a way to get the water to move in a time frame -- instead of geologic time, you can have it move during our lifetime.

Q I got it. So this is for purposes of the lab to kind of accelerate the movement of the water so that you can get some analysis done more quickly?

A That's correct. And this is a readily accepted method. It's within the ASTM standard.

Q And then finally, at the bottom, you have average permeability, 1.3E-8 centimeters per second -- or dash eight centimeters per second. Could you tell me kind of -- what does that mean?

Page 852

A Well, this is -- I don't know how basic, so I'll be basic. It's a scientific notation, just keeps you from having to have a bunch of zeros in front. Normally for negative eighth, you would actually have seven zeros in front of the one, so it would be point, zero, zero, zero --

Q That's what I was asking.

A Centimeters per second.

Q And one more thing. Going back to the top where it says "Sample ID "and it says "E-11" and "40.5 to 41.6," and then there's another parenthetical that says V-E-R. Does that mean we're looking at the vertical permeability?

A I believe that's correct, but I would have to study this to refresh myself on that.

(Brief pause)

A That is correct.

Q (By Ms. Perales) Thanks. So could you turn to the next page please, Page 968?

JUDGE CARD: If I could stop you just for a second, I just noticed at the very bottom on 967 there's a remark about shrinkage hair cracks. Is that fracturing, or is that something else observed in the sample, or does that have to do with the way the sample was handled or --

Page 853

A Well, it's -- the source of the cracks aren't described, so I don't know that. But it's not unusual, when creating a sample and putting it onto the stand, to take one last look at it, and they observed something which looked like cracks and it could have been striations. It could have actually been -- remember, not all fractures go all the way through a sample. It can actually just be a little bit on the surface, so it might have been that. It's not very specific.

JUDGE CARD: Okay. Thanks. Sorry, Ms. Perales.

MS. PERALES: That's okay.

Q (By Ms. Perales) How did these cores get to the lab; that is, are they put in the mail or are they driven there? How long does it take to get there?

A It depends on where the lab is.

Q Okay. In this case, do you know?

A This one, I believe, we used an out-of-state lab.

Q So then was it put in the mail?

A So it's actually put in a Fed Ex truck. So first of all, they're put into these core boxes that you see, but, first, they're wrapped in plastic. They're taped, sealed. Then they are further wrapped

Page 854

in tinfoil, I believe.

And, again, these are all standard methods that everybody in the community uses. Then they're put in core boxes that are taped shut and labeled so you -- and you're also labeling the core. On the core itself, you're labeling on the plastic what the depth is, what the boring number is. This is so you don't get confused with where things are, because it gets pretty easy. All this stuff looks alike after awhile. So everything is labeled really well.

Then it's Fed Ex'd up to the laboratory and there's fragile labels put on it so they don't throw them around, which Fed Ex never throws things around.

Q I was just wondering if some of those rock cores or soils could end up with cracks from the travel.

A If you saw fractures from -- well, first of all, there are already fractures in there that are not related to natural geologic processes, just because as you're coring, you can actually twist part of the limestone in the barrel and create a manmade fracture.

They look very different. So on inspection, you can tell that they're different. The

Page 855

same with, if you dropped one -- as a matter of fact, we could break one of those, with permission from counsel, and you would see that it has an uneven-looking surface. So you can distinguish those.
Q Okay. Let's see. Page 968 --
A Yes.
Q -- in the Sample ID box, it references the same -- the same rock core, E-11, and the same depth, 40.5 to 41.6. Is that right?
A That's correct.
Q And then in that parenthetical next to those numbers is H-O-R. Does that mean this is horizontal permeability?
A That's correct.
Q And here down in the box, it says "test data." The gradient is 50.8; again, something created in the lab. Is that correct?
A That's correct.
Q Okay. And then the -- at the very bottom, average permeability is where we get our final number. Is that right?
A That's correct.
Q Okay. And if we could look at one more on Page 971 --
A Okay.

Page 856

Q -- that one appears to reference Boring No. E-13. Is that right?
A That's what it says, yes.
Q So if we turned to Page 525 --
A Okay.
Q -- that should be the core log that corresponds to this permeability analysis. Is that right?
A That's correct.
Q And this one appears to have been taken from a depth of 46.5 to 47.5. Is that right?
A That's correct.
Q And, again, this is -- the description here is light yellowish brown silty clay with sand, which, again, didn't -- especially the sand part didn't seem consistent with what was the description in the rock core log. Is that just -- can you explain that?
A Again, that's a technician putting this all together and writing something down quickly in order to differentiate between other samples.
Q Is it possible that there was sand in the claystone?
A It's -- well, actually, I'm not as up on the geology as our geologist gal is. So I would prefer not to talk about it. I just -- I haven't studied it.

Page 857

Q Okay. But does that seem unusual to you that there is sand in the claystone?
A I don't know about this site, but claystone can have sand in it, yes.
Q Okay. That's helpful.
Then if I look at the rock description on Page 525 --
A May I correct that also? This is a technician setting up a test that's not using terms of art necessarily. They may have just felt something grainy on it that might have been just a little bit of sloughing of material that he or she may have called sand and not really known it, because a geologist doesn't necessarily set these up. A technician sets these up, and they're well trained for what they do, but they're not trained to identify samples.
Q What kind of technicians are these? Are they, like, engineers?
A These are typically high school graduates that have been trained in-house.
Q Okay. So back to Page 525 to my rock description, if I look at the interval between 45 and 50, it appears that there are fractures at 45.7 and 47.7 feet. Do you see that?
A I do.

Page 858

Q So it looks like -- the sample that was used for the permeability analysis, it looks like it just missed the fractures, doesn't it?
A The sample is placed -- it looks like it's placed between the two delineated fractures on the log. I notice that the fracture column is .6 for this one, which is actually fairly high compared to others in that area anyway.
So what I don't want to suggest is that the only fractures that existed in that core were the ones that were specifically called out. I don't know that. I don't know that they aren't the only ones.
Q So there could be -- I mean, it could be more fracturous than what this rock description represents?
A There may have been -- I don't know that. That's what I'm saying.
Q Okay.
A I don't want to pretend that I do.
Q Okay. Do you know what the .6 in the fracture column means?
A I just learned that the other day.
Q Yeah. I could use a little reminder.
A It's the number of fractures that are located within that five-foot section divided by five foot, so it's an idea of number of fractures per foot.

Page 859

Q Okay. So it's the number of fractures?
A Per foot, right.
JUDGE CARD: So if there were five, the number would be one?
A Correct. And they do go above one I see.
Q (By Ms. Perales) Then staying on that rock description, it describes the fractures as totally healed. Do you see that?
A Yes.
Q So at least for the two fractures that are mentioned in the rock description, those seem to be completely healed. Right?
A That's what it reads, yes.
Q Okay. And if there were other fractures that are there that are not completely healed, it's just not reflected here?
A That's correct.
Q Okay. I think I got it. So can you turn with me now to Page 974.01?
A Am I going to be going back to the logs?
Q Let me see if I have questions on that. I would say yeah. Please keep a marker there.
A Would you say that page again?
Q 974.01.
A Yes.

Page 860

Q Here it says "permeability of rocks by flowing air." Do you see that?
A I do.
Q How is that different from what we were just looking at?
A It's a permeability test, but it's meant for even less permeable rock or core than the claystone, and because water is a more viscous fluid, it's harder to get it to move through nearly impermeable materials, like limestone, and so you use air instead.
Q And do you know if this ASTM D4525 is recognized by the TCEQ rules?
A I don't know either way. I believe that ASTM as a standard is -- I'll say this: During my time at the agency and my time working with the agency, I've never seen an ASTM standard that was rejected.
MS. PERALES: Could I have just a second, Your Honor?
JUDGE CARD: Sure.
(Brief pause)
Q (By Ms. Perales) Okay. Do you have a copy of the rules there in front of you?
A I do not.
Q Could you turn to Rule 330.56, please?
A Okay.

Page 861

Q And could you look for the part that refers to the geotechnical report, which is going to be Subsection (d)(5)(B)?
A I'm there.
Q I know it's kind of difficult to figure those out. Are you there?
A I'm there.
Q Okay. Is this section -- is this where I would go to look to see what kinds of tests or analyses are allowed by the TCEQ rules?
A I think I would say "that are called for" or "specified," not "allowed." I wouldn't use the word "allowed."
Q Could you look at -- on Page 2238 in my book?
JUDGE CARD: In the rule book?
MS. PERALES: In the rule book, yeah.
MR. MOORE: It might not be good to speak in terms of page numbers. He might be working from a 2006 copy, a 2005 copy. All those numbers are going to be different.
MS. PERALES: Right. We have the same year, 2006.
MR. RILEY: Not all of us do.
MR. MOORE: That's another point. Not all of us do, so if you can call out the reg, that

Page 862

would be much more helpful. Thank you.
MS. PERALES: I'm sorry. It's 330.56 Subsection (d)(5)(B) addressing geotechnical report and then (ii) underneath that.
A I'm there.
Q (By Ms. Perales) Could you read that first sentence under that subsection?
A Sure. "Permeability tests shall be performed according to one of the following standards on undisturbed soil samples."
Q So the rule uses the term "shall." Is that right?
A That's correct.
Q And then what are the permeability tests that are referenced by the rule?
A It's in the next subsection, (i).
Q I could find not this air ASTM D4525 referenced in this rule. Is it in there, maybe by a different name?
A I understand it's covered in a different way. Hold on.
When a standard method isn't suitable for a material, the opening paragraph to the geotechnical report section, (b), basically says that all engineering tests shall be performed in accordance

Page 863

with industry's practice and recognized procedures, such as described below. And so for the permeability tests, it's physically impossible to do the standard test cited here on impermeable limestone so a --

Q Well, hold on just a second. Going back to my original question -- so ASTM D4525 is not one of tests that shall be performed according to this rule. Is that correct?

A I do not see that in there, no.

Q Okay. And then the data here behind this ASTM D4525, these look a little different than the ones that we have just been talking about. So I want to make sure I understand these.

So the first -- Page 975, it looks like the sample number is E-3D. Do you see that?

A I'm going back there. E-3D, yes, 13.6 to 14.7.

Q So if I go to the rock core log for E-3D, I should be able to tell what you're sampling. Is that right?

A That's correct.

Q And it looks like that begins on Page 463. "That" being the boring log or the rock core log. And this one appears to be taken from the interval of 13.6 to 14.7, so roughly it looks like a foot. And if I go

Page 864

to the interval between 10 and 15 on Page 463, is that where I should be able to determine the sample you used?

A That's correct.

Q Okay. So I'm going to just do the same exercise with maybe one more sample.

A Okay.

Q Can we look at Page 978?

A Okay.

Q Here it looks like it's Boring No. E-11, and the depth is 57.8 to 58.9. Is that correct?

A Right.

Q Again, roughly a foot or so -- and I can't tell from here if this is measuring horizontal or vertical permeability. Could you tell me where I might find that?

A It doesn't state it on it. In laboratory practice, if it doesn't state it, then it is vertical.

Q Okay. If I go to E-11 -- let's see if I can find that -- which begins on 515, and then go to the interval between 55 and 60 on Page 517, I should be able to determine which sample we're looking at. Right?

A That's correct.

Q And there in the rock description, it appears

Page 865

there was a fracture at 56.9 feet. Is that right?

A That's correct.

Q And that fracture is described as horizontal. Correct?

A That's correct.

Q So the sample that was used for your permeability analysis did not include a fracture. Is that correct?

A It did not include that fracture. That's correct.

Q And at least if I were just relying on this rock core log, it looks like the sample you took did not include any fractures. Is that right?

A Not that I would know of.

Q Okay. I'm done with that exercise, by the way. Thank you. I have just a couple more questions.

Is it possible that permeability could be affected at all by such a big increase in the gradient?

A Could you say more?

Q Well, you know, we were talking about how it looks like there was a gradient in the lab of around -- roughly, like, 50 feet per foot, but that's not what occurs out in the field. Is that right?

A That's correct.

Page 866

Q And based on what I heard yesterday from Ms. Gallup, it may be as much as 50 times more than what we might find out in the field.

A It's higher in the laboratory on purpose, yes.

Q Okay. Could that affect the permeability analysis?

A I'm sorry. The ones that we were looking at were highly impermeable substances, and so the -- let me back up.

If it were a loose material, loose sand, then you're right. You would blow by it. You would increase the permeability. You would create more fractures. You would create more water paths, but in a hard stance, one that's cemented and very firm, then you're not going to affect the permeability in it. You're not going to increase it or decrease it. If it were going to do anything, it would increase it, but it doesn't do that.

Q Okay. So if it were -- if we had sand, if it were a different type of substance, then increasing the gradient so much might increase the permeability?

A You wouldn't do a test like this on a material that could be impacted by it. It's always -- the flow-through pressure is always proportional to

Page 867

the kind of material that you're in, but you're doing a hypothetical.
Q Yeah.
A If you had a crazy lab person, they could make it happen, and they could blow by a material with a lot of pressure.
Q And do the high school graduates also perform these tests?
A Under supervision of a geologist, yes. Actually, they set them up. They don't perform the tests.
Q Okay. So it seems to me -- and correct me if I'm wrong -- that field tests or tests out in the field would be more reliable than lab tests. Is that fair?
A They give you different information, not better information.
Q Okay. But if these samples don't include any fractures and we know that fractures exist out in the field, doesn't it seem like it would be better to do some field analysis that include fractures?
A I don't think it's good to do just one thing when you're trying to understand a site. I think it's important to get a big picture.
Q So more than one thing maybe?

Page 868

A Yes.
Q So maybe field tests and lab tests?
A Exactly.
Q So you mentioned that these high school graduates, that they're supervised by an engineer. Is that right?
A Or a geologist.
Q Did you supervise them?
A I did not.
Q So somebody at the lab -- at this particular lab, you're assuming, was supervising them and was a certified engineer?
A They were either a geologist or an engineer, and I was not there so I can't tell which one.
Q Okay. Sticking with this engineer supervision, I see on Page 280 of Volume 3 that you included your professional engineer seal for the geotechnical report. Is that correct?
A That's correct.
Q But right above it, it says that you reviewed the documentation and the report. It doesn't say that you prepared it. Is that fair?
A That's correct.
Q Did you supervise its preparation?
A I did not.

Page 869

Q Well, could you tell me what a seal -- a professional engineer's seal means?
A It means that an engineer who is licensed in their particular state as a professional engineer, it means that they have reviewed and examined and understood the contents of a report that requires engineering judgment that's within their field of expertise and that they concur with its findings.
Now, you can be the author. You can be a co-author. You can be a pure reviewer, and you can still seal a document.
Q If I wanted to determine what the significance of the seal by a professional engineer is, would I turn to -- do you know the rule that I would look at?
A The engineer's board has a set of rules. You would go there.
Q Do you know if that's at 22 TAC Chapter 137?
A I don't know the citation.
MS. PERALES: May I approach, Your Honor?
JUDGE CARD: Yes.
MS. PERALES: I'm not sure I'm offering this into evidence, so do you want --
JUDGE CARD: We still want copies to

Page 870

follow along.
MS. PERALES: Okay. Sure.
Q (By Ms. Perales) Does this look like the rule I should be looking at to determine what significance a professional engineer's seal has?
A I don't know entirely what you should be looking at, but this is definitely a section of the rule that discusses the use of engineer's seals.
Q Okay. If you look at Subsection (b), could you read that entire subsection, please?
A "License holders shall only seal work done by them, performed under their direct supervision as defined in 131.81 of this title, relating to Definitions, or shall be standards or general guideline specifications that they have reviewed and selected. Upon sealing, engineers take full professional responsibility for that work."
Q So would it be fair to say that, according to this rule, if you affix your seal to a document, that you must take full professional responsibility for that work?
A That's absolutely correct.
Q And so in other words, if I'm reading this correctly, the person affixing his seal to a document shall have performed the work or it shall have been

Page 871

performed under his direct supervision. Is that right?
A That's how it reads.
Q Right. Okay. But it doesn't just say reviewed the work; I mean, does it?
A I'm going to just not comment on this because this -- obviously, I think this requires an attorney's opinion.
What I know is standard practice in our community, and especially in the state of Texas, reviewing work like this and resealing it is completely accepted, and I won't be the person that can interpret this.
Q Okay. But you can see -- I mean, is my interpretation fair that it appears to read that you shall only affix your seal if you've done the work or its been performed under your direct supervision?
MR. MOORE: Objection. He's already testified that he can't interpret this. He's not the person to interpret this, and she's just asked for another interpretation or a characterization of whether her interpretation is fair.
JUDGE CARD: I'll sustain. I think it's the same question basically.
MS. PERALES: Okay. I'll pass the

Page 872

witness. Thank you.
JUDGE CARD: Dr. Evans?
CROSS-EXAMINATION
BY MR. EVANS:
Q I'm Orlynn Evans. I live in Hutto.
A You do.
Q We got a Geology 101 course yesterday, and if I reiterate some of that stuff or ask you to, please feel free to give me a little more instruction.
A Sir, I'll let you know I've got a slight hearing loss. I'm going to have trouble hearing you.
Q I'm sorry. I should have known better. My wife criticizes me for not hearing.
JUDGE CARD: Is that better?
A It's better. Thank you. Lean forward a little bit.
Q (By Mr. Evans) Please turn to APP-202, Page 515. And I think my questions will be somewhat more of a general attempt to be sure I understand what's been going on here for a while.
A Yes, sir, 515.
Q That's identified as final soil boring logs for Boring No. E-11?
A That's correct.
Q As I understand this, it simply begins at

Page 873

surface level and goes deeper in intervals of five feet?
A That's correct.
Q So the depth zero -- what I'm looking at there, the hard, varied, dark gray lean clay, that's the soil that I'm used to seeing in my yard probably then?
A On the ground surface. That's correct.
Q All right. I notice that it goes down to 20 feet, and you make the statement, "See rock core log for E-11 at 20 feet," that identifies it as lean clay.
A I'm sorry. I lost you as to where you are.
Q At the bottom of Page 515. It says, "Very stiff to hard pale yellow, mottled with yellow and light gray lean clay."
A That's correct.
Q And then I'm instructed to see the rock corings at 25 feet at the rock core log for E-11.
A Yes, sir.
Q So I need to turn to Page 967?
A That's correct. I'm sorry. 516.
Q Oh, 516 is a continuation?
A That's correct.
Q Yes. I would like to go now and look at the

Page 874

permeability logs.
A Oh, sorry. Where are we going?
Q It's 967. You might want to keep that 515 open.
A Got right to it.
Q At 967, we have a drilling log from 40 and a half feet to 41.6 feet. Is that correct?
A That's correct.
Q This question of permeability was discussed quite a lot yesterday. I understand the exponential notation, and I do have a question.
Do I see four samples there at the bottom of Page 967?
A That's correct.
Q And then the 1.3 times ten to the minus eight is the average of those four?
A That's what it reads, yes.
Q And there is no pattern in those samples over time which -- would it be appropriate to say that those -- the differences in those measurements are simply sampling error?
A You're looking at the four --
Q I'm looking at the four different ones over time from 10 a.m. to 4 p.m.
A You typically see a bit of a range. You

Page 875

wouldn't see a very big one. Typically you see it steady out a little bit in one direction, but these are such low numbers. This is such tight stuff that it's really hard to get them to steady out, so there's nothing unusual here basically.

Q So that is what you would -- I'm sorry. Are you finished?

A Yes, sir.

Q So those differences are within the range of a standard error, plus or minus, some value?

A This is Mom Nature. So this isn't so much statistics as it is the vagaries of the sampling, the low, low numbers that we're working with. I mean, so maybe we're getting to the same place, which is it's a combination of just mathematically you're not going to get the same number over and over and over again because it's such small numbers. And, also, just the fact that it's -- you know, there's variations in the material. It's finding a different path. You know, it's just not perfect. It's not homogeneous.

Q I notice in these logs, as we go from the surface to clay to claystone to Austin Chalk, we do have some differences, but essentially the permeability is within the ten to the minus eight to ten to the minus ten. Would that be correct?

Page 876

A I think that's a pretty fair characterization. They're very, very tight materials.

Q Until I reach 9.9E to the minus eight, I don't change to E to the minus seven. Correct?

A That's correct.

Q Why do we care?

A Why do we care? Could you be more specific?

Q That's kind of what I'm wondering. Like I say, we spent quite a bit of time on this yesterday, and it would appear to have some significance even in what's been asked today.

Let me -- perhaps my impression will enable you to answer that, "Why do we care." There seemed to be some concern yesterday about breach in the geomembrane, and if leachate or fluid leaks out of the geomembrane, either by overflow or by damage, then is that the point at which the permeability becomes important as we look at the impact on groundwater?

A It is. So you would want to look at the permeability of the liner underneath the -- I'm sorry -- the clay -- compacted clay underneath the liner if it's breached.

Q Perhaps this is -- feel free to disclaim responsibility for this if you like, but Ms. Gallup yesterday made a statement, which, I believe, is in

Page 877

agreement with TCEQ rules. She said that leachate, where the head is above 12 inches, she suggested that should not ever happen. Are you familiar with that?

A I don't remember her saying that, but I was in and out.

Q I think she used one foot.

A One foot.

Q She used one foot.

A I'm sorry. I'm not familiar with her saying that.

Q Are you familiar with that situation?

A I'm not sure what you're talking about. One foot where?

Q Well, the statement, I believe, was that leachate should -- on the geomembrane or on the bottom liner -- usually the geomembrane, if it's under Subtitle D, that leachate collection there should not be above one foot on the geomembrane.

A I have a general knowledge that the landfill will be designed for a one-foot level of leachate above the liner, after which the sump kicks in and lowers it down, and I was just curious. I asked how that worked. So there's actually a level switch that goes off and on and automatically kicks in the pump.

Q In the case of the failure of the switch,

Page 878

then we could expect leachate to build up until it's detected by some sort of a field test?

A If the switch fails -- there's other sumps, for one thing and -- I'm getting into an area that's not my --

Q I'll let you off the hook.

A I love to talk about it, but it's not my field.

Q Yes. Well, again, that was the reason of the "why do we care about the permeability essentially." I think you've explained it.

If I understand you, you're saying we care about the permeability when, for some reason, the liner under the waste should fail in some way?

A Well, you want to -- ideally you would want a place like this that has highly impermeable soils under it just because you don't want something that shoots quickly to a drinking water.

Q Thank you.

A I'm sorry.

JUDGE CARD: Go ahead.

A If you don't have that -- if you live in Corpus Christi where they don't have those kinds of clays or are not as fortunate, then the reason for wanting to know the permeability is so that you can

Page 879

kind of know where things are going so that you can correctly put in monitoring systems to find out if things are moving.

So as our exercise, we want to understand the permeability under this site, not just because it's really nice to have a barrier, but also so we can understand where things are going if a breach occurred.

Q (By Mr. Evans) Just one more thing before I turn you loose. Fissures then have a -- is it correct that fissures increase the permeability of the material, the rocks and clay?

A Fractures?

Q Fractures, if you like; yes.

A Fractures locally can cause no movement in water. You can have a localized fracturing system that's not connected anywhere. You have to be connected somehow to water. If you have a general fracturing system, then you can get movement through it, yes.

MR. EVANS: Thank you. Pass the witness.

JUDGE CARD: Ms. Fox?

Page 880

CROSS-EXAMINATION

BY MS. FOX:

Q Good morning, Mr. Cravens. I'm Carol Fox, board member for Jonah Water SUD.

A Morning.

Q I just have a few questions. Could you describe the duties of the techs that you mentioned to Ms. Perales?

A The laboratory technicians?

Q Yes.

A When a core sample comes in, the first thing that happens is a geologist takes custody of it, or an engineer -- a geotechnical engineer, depending on who is working there, and then it's -- you have custody of it.

They indicate where samples are going to be taken. Sometimes there's relogging done in order to get more detail -- the geologist. And then the samples are identified, and they are subdivided, and then they're handed over to a technician who loads -- and sometimes the geologist does it, by the way, but sometimes it's a technician. It's just more cost effective. And they'll load the cells and they'll put it all together so that it works. So it's just simple when you're testing the strength of some clay.

Page 881

You'll mark, as a geologist, where you want it. The technician will actually carve it, will prep it, put it on a -- a top cap and a bottom cap, put it in the machine, and then the geologist will stand by and supervise the loading of it and then watch the break.

And now it's all computerized. You get the actual readouts, and that's kind of -- the technicians are there as a helper.

I do answer long. I apologize.

Q That's quite all right. It's enlighting. I believe you said that these techs are typically high school graduates?

A That's been my experience. Sometimes they're more educated than that.

Q Then in the description of their tasks, you didn't mention any labeling.

A That's typically done by the geologist, and they would be suitable for that as well.

Q Because I believe you said to Ms. Perales that the discrepancy in the description of one of those boring samples, a tech might have called the slough-off from the sample sand. So does that not imply that they were doing some of the labeling, some of the descriptions?

Page 882

A Oh, yeah, the forms, sure. That's part of doing the set-up.

Q Okay. And why is it that -- do you hire high school graduates because they're cheaper?

A Well, it's not highly technical work, so it's appropriate for their age, and we hire bright people, and we hire conscientious people, and we train them well.

Q What kind of error level typically occurs with the techs?

A I don't know the numbers. A geotechnical laboratory is tested annually, along with all the geotech labs in the country. We're sent standard samples, blind samples. The techs don't know that they're getting these samples, and we then compare to the rest of the country, and you get your certification based on that.

So I don't know the numbers, but I do know that geotech labs are certified in that fashion in order to catch consistent errors.

MS. FOX: Thank you.

JUDGE CARD: That's all, Ms. Fox?

MS. FOX: Yes. I'm sorry. Pass the witness.

JUDGE CARD: Just wanted to make sure.

Page 883

Mr. Dunbar?

CROSS-EXAMINATION

BY MR. DUNBAR:

Q Good morning, Mr. Cravens.

A Morning.

Q Before we begin, I guess I want to make it clear, at least in my mind, what you're here to testify about today. I believe in response to Ms. Perales' questions you had indicated that you were here to talk about a portion of the -- I guess the geotechnical report that's in Attachment 4 of the Application in Section 6. Correct?

A I don't know the sections by heart, but the geotechnical report and supporting documents.

Q All right. And that's a geotechnical report that you have your seal on?

A That's correct.

Q Okay. And you, as a result of putting your seal on it, did I understand you to say that you're assuming full professional engineering responsibility for that work?

A That's correct.

Q Okay. And by -- in order to do that -- and I'm going to paraphrase, and so tell me if I'm wrong -- but I believe in order to do that is it your

Page 884

understanding that you thoroughly reviewed and adopted all aspects of the geotechnical report, including its opinions and conclusions as if it was prepared by you or under your direct supervision?

A That's correct.

Q Okay. And is that why you believe you can, therefore, put your seal on it?

A Yes.

Q Okay. Besides the geotechnical report, I believe you told Ms. Perales that you were also here to talk about slope stability.

A That's correct.

Q Okay. And have you put your engineering seal on the slope stability analysis work that's contained in the application?

A I have not.

Q And why have you not put your engineering seal on the slope stability analysis work that's contained in the application?

A Those were technical -- separate technical reports -- and this is an engineer's understanding. I don't believe a seal was required on that -- a separate seal was required on that upon an amendment.

Q A separate seal wasn't required by -- upon amendment, is that what you said?

Page 885

A Correct.

Q What do you mean by that?

A Well, again, this is where I don't want to be an attorney. So I was asked to reseal and review the geotechnical report, and that's what I did upon request and -- at the same time I looked at these technical addendums, but I was not asked to reseal those and did not.

Q Okay. And so you presented -- you have sealed a portion of this application that we're here in this hearing about, and you discussed it in your prefiled testimony. Correct?

A Correct.

Q And your seal is contained in here on Page 280 of the application. Correct?

A Correct.

Q And because of that, you take full responsibility as a professional engineer for all that work associated with the geotechnical report. Right?

A Correct.

Q But you were not asked to do the same thing for all of the other work that was prepared by Mr. Querio of Earthtech, your predecessor. Correct?

A I was not asked to seal those documents. That's correct.

Page 886

Q Okay. And so you have thoroughly reviewed those documents and are willing to adopt them, including all their opinions and conclusions as if they were prepared by you or under your direct supervision?

A I have, in preparation for this hearing, completely -- reviewed them in great depth and have not been asked to reseal them, but I would be willing to do that.

Q But that's not in your prefiled testimony, is it?

A Is what not in my prefiled testimony?

Q Anything talking about all the other work that was done by Mr. Querio and sealed by him and contained in this application, outside of the geotechnical report. Correct?

A I don't know if the geotechnical report referred to the slope stability analysis or not. I believe it did.

Q Could you please find in the geotechnical report where it does refer to the slope stability analysis?

A It's discussed on APP-202, Page 330, Section 7.3.4.

Q I'm sorry. I didn't hear that page number.

Page 887

What page number was it?
A Page 330.
JUDGE CARD: I apologize. As you can tell, we've got construction work going on next door and there's nothing we can do about. So we'll have to live with it, but I do apologize for the annoyance.
Q (By Mr. Dunbar) Can you help me find on Page 330 of the application where you're referring to?
A 7.3.4, excavation considerations, first paragraph.
Q And because of that -- I guess it's the first two sentences under Paragraph 7.3.4 that indicates that you were the geotechnical engineer that we should be looking to to talk about slope stability analyses contained in Attachment 6, Subsection C?
A That's correct.
Q Okay. Besides the slope stability analyses contained in Attachment 6, Section C, are you here to also testify about any other aspects of Mr. Querio's work that's contained in the application?
A Not that I know of.
Q All right. You're not here to talk about Mr. Querio's work that's contained in Attachment 10 of the application, are you?
A I don't know what that is.

Page 888

Q Okay. If you have -- if you would, turn to Volume 5 of 5 of the application. It's the last one. And on the very second page of the entire document, Page 1869, it's just the table of contents. Do you see that right after the title page?
A I do.
Q And what is -- in Volume 5 of 5, under Part III, Attachment 10, what does that say Attachment 10 is?
A Soil and liner quality control plan.
Q Okay. And are you here to testify about anything associated with Attachment 10?
A I am not.
Q Okay. Thank you.
JUDGE CARD: You're not?
A I am not.
Q (By Mr. Dunbar) Mr. Cravens, I would like to go over a little bit with you the geotechnical report. Okay?
A All right.
MR. EKOH: Excuse me, Judge. Would this be a good time to take a break?
JUDGE CARD: It might be at that. Let's take -- let's take ten minutes. Thank you.
(Recess: 10:20 a.m. to 10:41 a.m.)

Page 889

JUDGE CARD: Back on the record. Mr. Dunbar, if you're ready?
MR. DUNBAR: Yes.
Q (By Mr. Dunbar) Mr. Cravens, just before the break, I was going to get into your geotechnical report and so -- I actually don't think I have very many questions on that.
Really, the only question I think I have is, based upon your geotechnical report and all the laboratory tests that were run, would you agree with me that all of those tests that were run on the claystone and the limestone did not contain any fractures?
A I think you kind of went back and forth. So is it that -- you're asking me if the limestone and claystone contains fractures?
Q In the core samples that were tested in the laboratory.
A Oh, I see what you're saying. The -- I don't know if they contain fractures. If they contain significant fractures, they wouldn't have been sampled because they wouldn't have been cohesive. They wouldn't have been in one piece.
If they -- going over the few examples, the identified fractures that were put in the log did

Page 890

not -- were not within the sampling range.
Q Okay.
A So I cannot say if there were fractures in any of the samples.
Q All right. Are you -- okay. Are you comfortable in testifying today, as we sit here, that the hyrdraulic conductivity values that Mr. Moore wrote on some of the exhibits in his questioning of Ms. Gallup for the claystone and limestone of ten to the minus ninth -- do you remember those numbers?
A I do.
Q Are you here today testifying that those hyrdraulic conductivity numbers reflect hydraulic conductivity through the claystone at this site containing fractures?
A You're talking about the laboratory tests, or are you talking about all of the tests?
Q All right. Let me try it again. That was a bad question.
MR. DUNBAR: If I may, Your Honor?
JUDGE CARD: Sure.
Q (By Mr. Dunbar) Do you recall seeing this Exhibit APP-404?
A I do.
Q And do you recall Mr. Moore writing this

Page 891

number, ten to the minus ninth, in the geologic layer labeled claystone?
A I do.
Q Do you understand -- what was your understanding of what he was trying to do when he put ten to the minus ninth associated with this claystone layer?
A My understanding is that he was characterizing the claystone as being highly impermeable, and that's represented by that value.
Q Okay. "By that value" being ten to the minus ninth?
A That's correct.
Q Okay. And what is your understanding of where that ten to the minus ninth number came from?
A I thought it came from the laboratory samples.
Q Okay. Do you need -- would you like to check to make sure?
A Sure.
(Brief pause)
A It looks like it was the laboratory samples.
Q (By Mr. Dunbar) Okay. So those we're the laboratory samples that are included in the geotechnical report that you put your engineering seal

Page 892

on. Correct?
A That's correct.
Q Okay. And my question to you is, those laboratory samples that had a hyrdraulic conductivity number of ten to the minus ninth, did those samples include any claystone that had fractures in them?
A I don't know that.
Q How would you determine that?
A I would have to have an understanding of the description on the logs for the sample when it says that it's slightly fractured, somewhat fractured, whether the person logging it meant that the only factures were the ones then described distinctly or whether there were lesser fractures or signs of fracturing.
Q Okay. Do you know if any of the core samples that were tested in the laboratory to determine the permeability or hyrdraulic conductivity of the claystone, if those core samples -- did they have any description in the documentation that they contained fractures?
A Not that I've seen. Well, no, not those samples, not that I've seen.
Q That's right. So the description of those samples that were tested in the laboratory did not

Page 893

indicate any fractures in those samples in the claystone. Correct?
A They were not called out specifically.
Q Okay. And wouldn't that be the place to find and determine if in fact there are any fractures in that core sample that was tested?
A I don't understand the question.
Q Isn't the purpose of having a description of the core sample that's tested is to indicate what the condition of that sample was that's being tested?
A The purpose of the description on the boring log is to describe the unit that you just sampled.
Q Okay. And isn't that where you would expect to find a statement indicating that there were fractures in that sample or not?
A Yes, and they do.
Q And it's your testimony today that none of those descriptions called out fractures in the claystone that were being tested. Correct?
A Not specifically on that sample -- on each sample.
Q So is it your testimony then that this ten to the minus ninth number that is shown on APP-404 is really the permeability or hyrdraulic conductivity of the claystone without any fractures in it?

Page 894

A I don't know that.
Q And why don't you know that?
A Because there were descriptions that said that the unit, the five-foot core sample, is slightly fractured, or words to that effect. Specific fractures were called out at depth, and those are the ones that I know about, and, frankly, those are the ones that are probably most visible.
There may have been other evidence of fracturing that was part of that description; somewhat fractured, slightly fractured. It doesn't necessarily mean that those were the only ones there. Now, I don't know that, but I don't want to mislead you.
Q And I don't want you to either. Okay. So would it be a fair characterization of your testimony that you don't know if ten to the minus ninth is the hydraulic conductivity of the claystone at this site?
A I know that it's a representative indication of the permeability of the formation for that sample.
Q Okay. Please try to answer my question.
A I'm sorry. I thought I did.
Q My question is, do you know if ten to the minus ninth is a represent -- represents the hyrdraulic conductivity of the claystone that underlies this landfill that we're talking about in

Page 895

this hearing?
A There were multiple samples taken and tested in the claystone and the limestone to determine permeability.
There were other tests that were conducted in the field to determine permeability. You don't use the discrete samples in that one value to determine the permeability. You look at the whole picture. You look at all samples and tests that you've done.
So to answer your question, what I know is that we have a range of samples and tests that we've run, and they indicate a very, very resistant material to water flow.
Q I'm going to try the question again. Would you agree with me that the core sample test results in the laboratory for the claystone indicate hyrdraulic conductivity of ten to the minus ninth?
A Yes.
Q Would you agree with me that the core samples tested in the laboratory for the claystone did not describe those samples as containing any fractures?
A That's correct.
Q Okay. And would you agree with me that the claystone at this site underneath the proposed

Page 896

landfill contains fractures?
A It does.
Q And would you agree with me that claystone that contains fractures would not be expected to have a hyrdraulic conductivity of ten to the minus ninth?
A Well, you asked that as a general question, a general question as "it could." They could all be healed fractures.
Q Okay. That would be the only way. Correct?
A If the fractures were minor and few and scattered, your equivalent permeability for the formation could be that low.
Q Okay. All right. But at least based upon the laboratory tests that are contained in the geotechnical report that you have sponsored and sealed, you cannot say, based upon those tests, what the hyrdraulic conductivity is in the claystone underneath this site based on those lab tests?
A Well, as with all science, you can say that it's highly impermeable and that it's in this range. You can say it's not a ten to the minus four; it's ten to the minus nine or eight or something like that, but laboratory tests are just one piece of information that goes into it.
With just the laboratory tests, I can

Page 897

say this is a formation that has highly impermeable materials as the primary matrix, and then you go to the next step. I can't answer -- I'm trying to answer your question.
I cannot say that it's solely representative of the total permeability of the unit, but it's a very good representation because it's a fairly solid unit.
Q Okay. And why do you say it's a fairly solid unit? And I'm assuming you're referring to the claystone here underneath the proposed landfill site.
A I was kind of blending the two, the claystone and the limestone.
Q Before we go any further then, is what you're testifying here today, this discussion we've been having, also apply to the limestone that was assigned a value of ten to the minus ninth?
A Generally, yes.
Q So you were about to say -- and I cut you off, and I apologize -- that this is a fairly impermeable geologic formation underneath the site?
A That's correct.
Q Okay. And is that a good thing to have underneath a landfill or a bad thing to have underneath a landfill?

Page 898

A I'm an engineer. I think it's good information.
Q Okay. You don't know one way or the other?
A It's -- you really just want to know where a release -- if a release were to occur, you just really want to know where it will be so you can intercept it and deal with it.
Q Okay. And is it fair to say --
A I'm sorry. And I would really rather have an impervious clay under there so something doesn't move really fast and get out of control. This will move really slow and give you time to fix things, so, no, I would prefer to have this.
Q You would prefer to have a good, solid rock impermeable type geologic formation rather than clay?
A Clay can also fit that description, but rather than a permeable -- highly permeable material, that's correct.
Q Okay. All right. And why would you rather have a highly permeable geologic layer under the landfill rather than a highly impermeable one?
A A hypothetical release could move very quickly.
Q And so what?
A And, therefore, your monitoring period would

Page 899

have to be closer together, and it can also get -- I'm doing the worst case, say we were sitting right on top of the sand aquifer. It would get directly into the drinking water.
Q Okay. So the more impermeable the geologic layer is under the landfill, the slower any contamination would be able to move through it?
A That's correct.
Q Okay. And, therefore, it would take much, much longer to get to the monitoring wells to be detected. Correct?
A That's correct.
Q And it would take much, much longer to get past the monitoring wells to potentially affect any drinking water or water used for irrigation or other purposes?
A That's correct.
Q And is it your testimony today that the claystone and the limestone that exist underneath the proposed landfill site is such a highly impermeable-type geologic formation?
A That's my belief, yes.
Q Okay. So you would agree with then the characterization of the hyrdraulic conductivity shown on APP-404 of ten to the minus ninth for the

Page 900

claystones and ten to the minus ninth for the limestone?
A As a general characterization of the unit, yes.
Q A general characterization of the unit, kind of just in total. Correct?
A Correct.
Q Okay. But you would agree with me that there are fractures in the claystone?
A Yes.
Q You would agree with me that because of those fractures in the claystone that groundwater can move through this claystone much quicker than what a ten to the minus ninth hydraulic conductivity value would indicate?
A I'm not sure I would use the term "much quicker," but it would move -- it would be a preferential pathway.
Q It would be quicker, or would it be slower?
A This is probably where we're stepping out of my expertise, so I'm going to stop there.
Q That's fine. So are you telling me that as a geotechnical engineer licensed in the state of Texas with all your experience and background, you can't tell me if water would move slower or faster if

Page 901

there's fractures in a rock formation?
A I was being site specific. I haven't studied up on this particular topic.
Q Got it. So you don't know a lot of the details about this specific site itself?
A Right. You can have a dry, fractured limestone that has water trying to get into it, and the negative pore pressures will prevent the water from even entering the limestone -- the fractured limestone. That's a hypothetical. I just don't know enough about the water traveling at this site.
Q Okay. And I'm going to put up here another exhibit labeled TJFA-15. Do you recognize this exhibit?
A I do.
Q Okay. And you were here in the courtroom when this exhibit was developed by me in cross-examining Ms. Gallup. Correct?
A That's correct.
Q And that's the indication of my drawings in black?
A Correct.
Q And then you were also here during the testimony by -- the questions by Mr. Moore to Ms. Gallup where he indicated some of the numbers in

Page 902

red. Correct?
A Correct.
Q And likewise, on this exhibit, TJFA-15, he indicated and has written down ten to the minus ninth centimeters per second hydraulic conductivity values, again, for the claystone and the limestone. Correct?
A Yes.
Q And the testimony you've given today in this case regarding APP-404 would also apply to TJFA No. 15 with regards to the hyrdraulic conductivity number of ten to the minus ninth for the claystone and the limestone?
A With regards to the numbers, yes.
Q So would it be fair to say, Mr. Cravens, that the ten to the minus ninth hyrdraulic conductivity numbers shown on those exhibits right behind you, APP-404 and TJFA No. 15, are really more reflective of an unfractured claystone and an unfractured limestone, if you know?
A Just reiterating that I don't know if there were minor fractures that weren't logged specifically in those samples, with that exception, then there were no logged fractures that were in the samples that were run that I know of.
Q I would like to now turn your attention to

Page 903

the slope stability analyses that you're here to testify about today. Is that all right?
A Yes.
Q And we have to go to Volume 4 of 5, specifically Attachment 6.C to find that.
A Yes.
Q Okay. Could you please pull that out?
WITNESS CRAVENS: Your Honor, is it all right for me to use my own copies?
JUDGE CARD: I think so, if they're identical.
WITNESS CRAVENS: They're identical.
MR. DUNBAR: Is there any writing on them?
JUDGE CARD: Is there any writing, like notes, that kind of thing?
WITNESS CRAVENS: No, I don't think so.
JUDGE CARD: That's fine.
WITNESS CRAVENS: I was incorrect; there are. I was incorrect; there is. I've got a few notes on them.
MR. DUNBAR: Can I just look at them?
JUDGE CARD: Mr. Dunbar may have to look at them just to make sure -- in general, if you're more comfortable with your own copy, that's fine.

Page 904

(Brief pause)
Q (By Mr. Dunbar) Okay. Mr. Cravens, for reference purposes, on Page 1583.01 of the application, it is the title page for Part III, Attachment 6, Appendix C.
JUDGE CARD: Gave me that again. I'm sorry.
MR. DUNBAR: Page 1583.01.
Q (By Mr. Dunbar) It's a green cover page, and that's just the cover page for Attachment 6, Appendix C. Correct?
A Yes, I see that.
Q And this is part of Part III of the application, which is the site development plan, and it is specifically associated with the design of liner system constraints. Correct?
A Correct.
Q Okay. And within the second page, the table of contents, Page 1584, there's a list of appendices, C.1 through C.5 that identify all the appendices that are associated with this part of the application. Correct?
A Correct.
Q Okay. And we will be focusing our attention primarily, if not solely, on the final buildout slope

Page 905

stability analysis in Appendices 6.C.3. Okay?
A Okay.
Q And is it your understanding that all of these appendices were prepared by your predecessor at Earthtech?
A That's my understanding.
Q Okay. And that would be Mr. Querio, whose engineering seal is contained on, I believe, all those appendices?
A That's correct.
Q And before we get into these analyses -- I don't want to put words in your mouth, but generally, this attachment contains the slope stability analyses that were done for this application. Correct?
A That's a good characterization.
Q Thank you. And why does one do slope stability analyses associated with the design of a landfill?
A The design and then the construction of a landfill, of course, involves the excavation of soils and the creation of slopes. And you would like to, as part of the design process, make sure that these slopes that you have chosen will be stable in the long-term and the short-term.
Q Okay. And what would happen if they're not

Page 906

stable?
A Well, from the term of art slope stability, because there's sloughing and raveling and just the normal -- not normal but occasional movement of soil that's not a slope stability failure.
A slope stability failure typically is a large movement of earth, usually in a localized setting, often rotational, sometimes a sliding failure, and what it does is it causes a transposition of soil from one spot to another over a relatively short amount of time.
Q Okay. And during the -- associated with the design of a landfill and consequently its construction and operation, various aspects of that landfill will potentially have the possibility of slope failure. Correct?
A I would say it's in the "you could be hit by a meteor possibility," sure, but in practicality, no, not at this site.
Q No, no, no, no. Just in general, the possibility exists for any landfill, during its construction and operation, that slopes could fail?
A That could happen.
Q Okay. And that's why you do the slope stability analysis, is to try to make sure that

Page 907

doesn't happen?
A That's correct.
Q And that's what's been done at this site?
A Correct.
Q And tell us, please, what some of those potential slope failures -- how could they occur or where could they occur during the process of a construction or operation of a landfill, briefly.
A The first place would be at any cut face of soil that you are using in order to create the lower part of the landfill, the basement of the landfill. So think of that in terms of the leading edge of the natural soil being cut to make room for the deposition of trash. That would be the first slope that you would pay attention to.
Q One second. I'm going to draw again.
Do you think you're going to need to refer to these exhibits, TJFA-15 or 404, in talking about slope stability?
A I can't think of a reason right now.
Q Could you come up and draw for me kind of what you just said in your last answer to try to illustrate what you're referring to?
A Sure. I don't draw very good.
Q I'm not very good, so you've got to be better

Page 908

than me.
A So, for example, in order to make this room available -- this is soil.
JUDGE CARD: If you could, speak up a little bit.
A Sure. In order to make this room available, you would have equipment excavate this slope right here.
Q (By Mr. Dunbar) Okay. So is this top line considered to be natural ground?
A It would be.
Q That's why you put these hashed lines there?
A That's correct.
Q And then this would be -- this diagonal line would be the excavated cut into the natural ground?
A That's correct.
Q Okay. And then down to this point, and then the excavation kind of continuing on horizontally?
A Usually it's got some slope to it for drainage.
Q But it's this diagonal part of the excavation where there would be some potential for slope failure that you would want to do an analysis for to make sure it doesn't happen?
A You actually look beyond the toe and you look

Page 909

below that baseline that I've drawn with the tick marks, and then you go further back from the top of the slope as well. You look at that whole thing.
Q And the toe you're referring to is where I put a little black dot?
A That's correct.
Q I'll label that "toe." Is that all right?
A Yes.
Q So you're saying you would look further to the left of the toe?
A That's correct.
Q About how far?
A Oh, you put in a long distance. You put tens of feet, even hundreds of feet. Sometimes the program that we use hunts and finds the place where it fails beyond the toe for you.
Q Then you said you put some tick marks here, and I'm just going to put them a little darker. Did I do that all right?
A Sure.
Q And you said you would look then from -- to the -- away from the toe, from the other side of the excavation or slope; you would start somewhere there --
A Yes.

Page 910

Q -- and then you would come and look through to the toe, through the slope and then some distance beyond the slope. Correct?
A Correct.
Q Would it be fair to put another tick mark somewhere over here?
A Sure.
Q And it would be fair to put another tick mark to the left side of the toe?
A Sure.
Q So that distance there essentially -- or that would be kind of the scope of where you would have your slope stability analysis to determine any potential slope failure of that incline?
A It would also go down with depth. So you would be looking below the baseline.
Q Okay. Can I draw an arrow down?
A Sure.
Q And this would be an excavated slope we're currently talking about. Correct?
A Correct.
Q Has -- are you aware of any excavations associated with landfills in the state of Texas where the excavated sideslope has failed?
A I'm not aware of that.

Page 911

Q And do you know if it -- if the potential for failure is dependent, at least in part, on the nature of the soils associated with or that are under the excavation?
A Yes, they are.
Q Okay. Is it one of the most important components?
A It's an important component.
Q Okay. Is the height of the excavation important?
A Yes, it is.
Q Okay. Is the slope of the excavation important?
A Of course.
Q Okay. All right. So can I label this "excavation cut"?
A Yes.
Q Okay. What would be the next place during the course of a construction or operation of a landfill where you might have the potential for a slope failure?
A You could have it in the trash face, the leading trash face. At this site, they're using a four-to-one slope on the trash face. So just by inspection, a formal slope stability analysis was not

Page 912

done.
JUDGE CARD: I didn't hear that last part.
A There's -- a formal slope stability analysis of the trash face was not done because it's got such a flat -- about 11 degrees off the horizontal angle on the front of it. So it just -- it couldn't fail, and if it did, it would just be sloughing. It wouldn't be an actual slope failure.
Q (By Mr. Dunbar) Okay. Could you do your best attempt to draw on this exhibit what you're talking about? Do you want to use a different color or black?
A Sure. Black is fine.
Q Okay. You've now drawn to the left side of this drawing something. Please explain it to me.
A That's meant to represent trash, and the reason I even brought this up is that at some locations they try to have steep trash faces -- working faces, and then the idea of it, you know, coming tumbling down is actually an issue. It's not an issue here, but I brought it up academically just so you knew that would be one thing you might look at.
Q Okay. So the first thing I could probably do is label that "waste"?

Page 913

A Yes.
Q And so I think what you're trying to say -- correct me in I'm wrong -- is during the operation of a landfill as they bring waste in, they put the waste down in the bottom of the landfill, and there is a slope associated with that waste pile?
A That's correct.
Q And it's your testimony that that slope that is proposed for the waste pile at this landfill site is four-to-one?
A Correct, about 11 degrees.
Q So I'm going to put four-to-one, and I also put 11 degrees.
A And what I was trying to do with the tick marks is the excavation cut maximum slope is three-to-one. That's about 18 degrees off the horizontal.
Q Whoa.
A Sorry.
Q Say that again slowly.
A So the excavation cut --
Q Over here?
A -- over there is at a maximum three-to-one slope, which is about 18 degrees off the horizontal.
Q Okay. So I can put a three-to-one and an

Page 914

18 degrees on this drawing associated with the excavation cut?
A Correct.
Q All right. I believe you said that for the excavation cut -- or maybe you haven't said it. Strike that.
Let me ask this question: For the excavation cut, has a slope stability analysis been performed in this application?
A Yes.
Q But for the waste pile, a slope stability analysis has not been performed?
A That's correct.
Q Okay. And the reason why is because it's at a four-to-one slope?
A Right. And that's 14 degrees. I'm sorry. I misspoke.
Q So the 11 should be a 14?
A Correct.
Q Can you read that as 14?
A Yes.
Q So under the waste, I'm going to write here "no slope stability analysis" for the reasons you gave.
A Right.

Page 915

Q All right. This thing we've labeled "waste," is it just all waste, or would there be some soil associated with it?
A There would be daily cover, and I don't know the operations manual well enough to tell you what that is.
Q Okay. When you were saying that the slope would be four-to-one or 14 degrees associated with the waste, were you including in that the daily cover?
A My understanding is it does.
Q Okay. So I'm going to write here "waste with daily cover." Okay. Does your assumption go beyond waste with daily cover, and does it include waste with intermediate cover?
A I don't know what that is.
Q Okay. I'm going to cross out the little "w" I put in the left-hand corner because it doesn't mean anything. Is that all right?
A Yes.
Q Okay. What would be the next or another place throughout the construction or operation of a landfill where you would anticipate or expect the possibility of a slope failure?
A You would want to take a look at the final constructed cross-section and you would want to look

Page 916

at different parts of that for failures.
Q Okay.
A I'm sorry. I missed one. On the excavation cut, of course, you're going to be putting a liner on top of that, and so you are going to want to study to see if there's a chance of a sliding failure of the liner materials.
Q Okay. Do you want to try to draw what you're talking about in terms of the liner?
A We might want to go with a different color.
Q Okay. What you've drawn on this drawing in pink is the liner you were just referring to that would be placed on top of the excavation cut?
A That's correct.
Q So I'm going to label that as "liner." Would that be fair?
A I think it's called side liner, but I'm not sure. Liner is fine. I'll understand it.
Q All right. I'll put an arrow like that. And it would have the same three-to-one, 18 -- three-to-one slope, 18-degree slope associated with it?
A That's correct.
Q And there was a possibility that there could be a slope failure because of the connection between

Page 917

the liner and the excavated cut soil?
A It could be related to that, or it could be related to the soil that's on top of the -- that whole liner is one term for several things, but there's a geofabric in there. So the topsoil above the geofabric could slide off of it as well, and then you could have the geotechnical fabric slide off by itself.
Q Okay. Can we then maybe refer to this liner as a composite liner that is composed of a number of different components?
A Sure.
Q So there is the potential for slope failure associated with the various components of that composite liner interacting with themselves as well as interacting with the soil underneath?
A That's correct.
Q And would that also be the case, that there is the potential for a slope failure associated with the waste that gets put on top of that composite liner, or were you inferring it was the same thing that we talked about over here on the left?
A I guess I'm not understanding the mechanics.
Q All right. When we were talking about the waste on the left of this drawing with a daily cover,

Page 918

do you know if underneath this waste there would be a composite liner?
A My understanding is there is.
Q Okay. And so would it be fair to also say then that on top of the composite liner we've drawn in pink on this drawing you would anticipate or expect there would be waste on top of it?
A Yes.
Q And do you know if a slope stability analysis was performed associated with the waste that would be placed on top of the composite liner that is sloped from natural ground to the bottom?
A I guess -- so what you're saying is during the filling process, trash goes on the excavation cut but before the top liner is put up, before it's built up. Is that what you're saying?
Q I'm asking you if you know if there's going to be waste put on top of the composite liner and whether a slope stability analysis was performed based upon that condition.
A Oh, I see. So if trash goes on that excavation cut, it would go down the side of the slope and out, and so my understanding is we did not do a slope stability analysis for that because it's the leading edge of the trash and the four-to-one would

Page 919

have ruled.
Q Okay. So even though the excavation cut would be a three-to-one and the overlying composite would be a three-to-one, any leading waste edge -- or as the waste gets placed, it would be placed such that its slope would be four-to-one?
A Right. It's placed from the bottom up when you get to an excavation cut. So you basically are just almost building it up as solid parallel layers.
Q Okay. So by drawing this, again, what you're saying is that this waste pile keeps getting added on to and added on to always at a four-to-one slope?
A That's my understanding, yes.
Q I tried to represent that with some black dashed lines on top of the waste with daily cover designation we had put on here before.
A Right.
Q And you would expect this kind of operation of the waste pile being moved at a four-to-one slope to also occur on top of this composite liner at a slope of three-to-one that we've shown on this drawing?
A Basically it would come up from the bottom up in order to move up the side of the excavation cut. So it would be almost like -- so it's not like you

Page 920

dump it from the top. You don't do that. It slowly grows from the bottom up in depth, the trash does.
Q Okay. What's the next potential for a slope failure in the construction or operation of a landfill?
A That's where I would go to final constructed landfill.
Q Okay. And what you're talking about there is a final cover slope going up above natural ground?
A Correct.
Q So can I draw a black line at a slope in this direction?
A I would do it a lot flatter. It's a really flat slope.
Q Why don't you do it?
A Do you mind if I measure?
Q Whatever you feel comfortable with.
A It's old trick of mine. It helps me with angles. So there's four this direction and one in this direction, so it's a four-to-one slope. That's the maximum slope for the height of the --
JUDGE CARD: Speak up, please.
A So this is the maximum slope of the -- steepest the landfill cap will be. It can be as flat as five-to-one, but I'm going to go ahead and show the

Page 921

four-to-one. So this is four in this direction, one in this direction.
Q (By Mr. Dunbar) So, Mr. Cravens, you have drawn another black line at a slope of four-to-one approximately --
A Correct.
Q -- from the intersection of the excavation cut at natural ground upward to the left. Correct?
A That's correct.
Q You were referring to that as the final cover?
A Correct.
Q So is it all right if I label that line that you drew as "final cover" and put on there -- first, is it okay to label this "final cover"?
A Yes.
Q I think you said you drew it approximately to represent a four-to-one slope --
A Correct.
Q -- recognizing that as you go, in some parts, the final cover is even at a five-to-one slope?
A Correct.
Q Should I put "five-to-one" and "four-to-one"?
A Sure.
Q All right. And so this is another place

Page 922

where during the course of the construction or operation of a landfill you could have the potential for a slope failure?
A That's correct.
Q And how might that happen?
A There's three different ways that this could happen. The first -- the first is through a failure of the foundation itself.
Q And what are you referring to when you say foundation?
A That would be the basement of the landfill itself along with an extension -- that baseline cut or drawing that I did at the bottom.
Q Okay. So this bottom line that runs approximately horizontal I could label as "foundation"?
A Sure.
So for that failure, you would be looking for a circumstance where the weight of the liner, the trash, everything on top of the foundation exceeds the capacity of the foundation and some of the materials I just mentioned, the trash itself, for example, was no longer sufficient to hold it, and you would actually have a rotating slide. That would be the failure type that we look at.

Page 923

Q So between the final cover and the foundation, it would be fair to put in here on this line "waste"?
A That's what most of that mass is. Correct.
Q All right. And then there's a potential for a slope failure because of the weight of this waste on the underlying composite liner and/or soil that could cause this whole thing to slide that way?
A Correct. And it could slide where you just showed it, kind of stopping at the foundation, or it can go into the foundation. And actually, the first analysis we did, that's more of the thing that we're looking at because we did look at the one you just described separately.
Q Okay. All right. What's the -- I'm going to draw -- would you draw an arrow -- because I'm not sure I know how to draw it -- trying to describe generally the direction we're talking about with this sliding that we were referring to? However you want to draw it.
A (The witness complied.)
Q Okay. Mr. Cravens, what you've drawn on this drawing is a dashed line that is kind of in the shape of an arc that starts from the final cover, goes through the waste, through the foundation, down into

Page 924

the soil, back up through the soil up to the surface of natural ground. Correct?
A That's correct. Can I say what that line represents?
Q Please.
A That line represents -- it's fantasy on this, of course, but that represents the highest stresses compared to strength. So that's not a failure surface. That's that ratio of stresses to strength. That's what that dotted line really represents. If the stresses were higher than the strength, it would become a failure surface. Does that make sense?
JUDGE VICKERY: In that shape?
A In that shape roughly.
JUDGE VICKERY: When you -- this No. 1, foundation, potential failure that we're talking about right now, is that what is referred to in this waste mass stability, the sort of cross-sections it looks like that appear? Do you know what I'm talking about?
A I don't know.
JUDGE VICKERY: We'll get to it later.
Q (By Mr. Dunbar) Okay. And within the application and within the slope stability analyses part of the application, Attachment 6.C, there will be some calculations and some exhibits that would show

Page 925

this type of a foundation slope failure. Correct?
A It will show where that stress curve is that I just described, correct.
Q This arching curve you show with a dashed line?
A Correct.
Q Okay. And if a foundation slope failure were to occur, it essentially would take this final cover and the waste underneath it and some of the soil, and it would just fail and move to the right?
A It would rotate and move slightly to the right.
Q Okay. And would that be a good thing or a bad thing?
A That would be a bad thing.
Q Okay. And could that result in waste being exposed to the elements?
A It could.
Q And that would be a good thing or bad thing?
A That would be a bad thing.
Q All right. Okay. Would it be fair then to label this dashed arc you just drew -- I'm going to label it as a "1." Would that be all right --
A Yes.
Q -- to have it represent a foundation failure?

Page 926

A Yes.
Q All right. What would be the second kind of failure you were going to talk about?
A That would be -- I'm actually going to do it in order from the study.
Q Okay.
A We did liner next. So it would be called a liner failure.
Q All right. So the second would be a liner failure?
A Correct.
Q All right. And can you explain how that kind of failure could occur?
A So this is -- so generally in slope stability, you're looking at rotational failures. You're looking at sliding failures like we talked about for the soil on top of the liner, and then there can also be wedge failures where you can actually have -- instead of the rotation, because you have a well-defined bottom surface, which in this case would be our bottom liner and side liner, that can push the soil into a certain direction. Instead of rotating, it actually would kind of wedge out to the right. Did that make sense?
Q Okay. Do you think you could draw something

Page 927

that reflects that?
A That would be hard.
Q Would it be better to draw it on a separate piece of paper?
A Actually, I'll do the same thing. I'll do the stress surface, same dotted kind of line so it would work here.
Q Okay. So now you've drawn on this drawing we're creating a dash-and-dot line. Correct?
A Correct.
Q Starting from, again, the final cover on the left and coming down -- at a straight line but at an angle down to the foundation and then running parallel with the composite liner back up to the surface?
A Correct.
Q And that could be a failure that could occur because of problems with the composite liner?
A It wouldn't be a problem. It would just be that -- the stress versus strength issue again. So the stresses exceed the interface that I've put out with the dotted line.
Q Okay. So the stress of the -- kind of the weight of the waste sitting on this composite liner along the side and bottom of the landfill would exceed the strength that exists between the various

Page 928

components of the composite liner as well as the underlying soil?
A Correct.
Q Okay. I got that right?
A Pretty close.
Q I'll label that as "No. 2." Did I do that right?
A Yes.
Q What would be the third potential slope failure associated with the final cover?
A It would be a failure actually through the -- primarily through the wastes.
Q So I can label this "waste" as "No. 3"?
A Yes.
JUDGE CARD: Mr. Dunbar, after this segment, we'll probably break for lunch because I don't know how long this is going to take.
MR. DUNBAR: I'm hoping we can finish this right before lunch.
JUDGE CARD: Thank you.
Q (By Mr. Dunbar) Is it possible for you to draw the number three waste potential failure on here?
A I'm going to exaggerate this just to keep the lines separate.
Q Mr. Cravens, you have now drawn a bunch of

Page 929

dots in a somewhat arced shape; again, starting from the top of the final cover, running through the waste pile and through the word "waste" and over to the right and ending up back in the final cover. Correct?
A Correct.
Q And explain how that kind of a failure could occur that you've identified as a waste-related failure?
A This is the least likely thing to happen because of the strength of the waste and the very flat slope of the site, but if it were to happen -- you want to analyze it.
And so what you do with this study is you actually force the program not to look at the foundation soils and below the foundation soils. So it forces the analysis to find the weakest path that's through the trash, and it may actually go past the toe line; it may not, but basically it's a rotating failure that primarily illustrates what would happen if the stresses exceeded the strength through the trash but including some of the liner.
JUDGE CARD: What?
A But including the liner, so it does include the strength of the top liner.
Q (By Mr. Dunbar) So it would be fair to

Page 930

designate that one as number three, and I've drawn a 3 there pointing to that dot.
A Correct.
Q I think you said that that would be the most unlikely slope failure to occur of the three we identified?
A That's correct.
Q Between the other two, the foundation failure and the liner failure, which one of those would be the most likely or least likely to occur?
A Depends on the cross-section you're looking at.
Q Okay. Explain that, if you could.
A Sure. One of the things that we're not showing in this drawing is that, of course, we've got different materials. We've got the clay. We have some gravel sometimes. We have claystone and limestone at depth, and so we did four different analyses for each one of these failure types at four different locations in order to take a look at the different thicknesses and strengths of clay, different thicknesses and strengths of limestone, you know, like that.
So in the bottom -- in the final analysis in some cases, the foundation had the lowest

factor of safety. In some cases, the liner had the lowest factor of safety.
Q Okay. I'm just going to write on here "factor of safety," and we're not going to talk about that until after lunch, but in terms of foundation, you actually looked at four different types of soil conditions associated with the foundation. Correct?
A I believe that -- as you and I have defined foundation, I don't want to say that; instead, the cross-section that was examined included all four of the materials that we've seen out there --
Q Okay.
A -- the natural materials.
MR. DUNBAR: Okay. I think, Your Honor, I would like to mark this and offer it into evidence as an exhibit, TJFA No. 16 -- 18.
(TJFA Exhibit No. 18 marked)
JUDGE CARD: Okay. Any objections to TJFA-18?
(No response)
JUDGE CARD: No. Okay. It's admitted.
(TJFA Exhibit No. 18 admitted)
MR. DUNBAR: Let's take a break.
JUDGE CARD: Okay. Before we go off the record real quickly, Ms. Perales, did we find out

anything about Mr. Arnett? Do you need to talk about that over lunch or what?
MS. PERALES: Yeah. I still need to talk to Dr. Evans. I've spoken to Ms. Fox.
JUDGE CARD: Let us know after lunch. I think that will be soon enough, if you could do that.
The other thing is today I'm going to have to cut out a little bit early. We kind of talked about that before. So I would -- we were thinking we would probably shoot for about 4:30 or something like that.
MR. DUNBAR: Maybe even earlier.
JUDGE CARD: That would be good, too.
MR. DUNBAR: We'll see how it goes.
MR. RILEY: Your Honor, you're in complete control of that.
JUDGE CARD: No, I'm hardly in control of it at all. When things reverse then you'll be more in control. I know how that goes.
If we have to take people out of order or something, we will, but I don't -- okay.
If you-all have some housekeeping things, you can talk about it before we reconvene, but let's reconvene at one o'clock.
(Recess: 11:46 a.m. to 1:03 p.m.)

AFTERNOON SESSION
FRIDAY, AUGUST 24, 2007
(1:03 p.m.)
JUDGE CARD: The parties have conversed and agreed to interrupt Mr. Cravens' testimony to get Dr. Borrer's testimony on. Is that correct?
MR. DIETZ: That's correct.
JUDGE CARD: All right. That's fine with us.
Ms. Perales, did you want to call Dr. Borrer?
MS. PERALES: Yes. We call Dr. David Borrer.
THE REPORTER: Can you give me a minute? I can't hear through the --
JUDGE CARD: All right. We've got a glitch in our -- just come on up, Dr. Borrer.
(Brief Pause)
JUDGE CARD: Dr. Borrer, would you raise your right hand?
(Witness sworn)
JUDGE CARD: Go ahead, Ms. Perales.
(Hutto Citizens Group and The Heritage on the San Gabriel Exhibit Nos. 1, 1A, 1B and 1C marked)

PRESENTATION ON BEHALF OF
PROTESTANTS HUTTO CITIZENS GROUP AND THE HERITAGE ON THE SAN GABRIEL HOMEOWNERS ASSOCIATION
DAVID BORRER,
having been first duly sworn, testified as follows:
DIRECT EXAMINATION
BY MS. PERALES:
Q Dr. Borrer, do you have in front of you exhibit -- this would be Protestants' Exhibit No. 1.
A The one you just passed out?
Q Yes.
A Okay. Yes.
Q And do you recognize Exhibit 1 as the prefiled testimony that you prepared for this hearing?
A I do.
Q Do you also have in front of you Exhibit 1A?
A Yes.
Q And do you recognize that as the exhibit that's referred to in your prefiled testimony?
A Yes.
Q Do you have before you Exhibit 1B?
A The demographic report?
Q Yes.
A Yes.
Q And is that the demographic report that's

Page 935

referenced in your prefiled testimony?
A Yes, it is.
Q And do you have Exhibit 1C?
A Growth Guidance Plan from the CD?
Q Right.
A Yes.
Q And that's the Growth Guidance Plan that's referenced in your prefiled testimony?
A Yes.
Q Do you adopt your prefiled testimony today as if you had presented it live today?
A I'm sorry. One more time.
Q Do you adopt your prefiled testimony as if you were presenting testimony live today?
A Yes. Yes, I do.
MS. PERALES: Your Honor, we offer Exhibits 1 through 1A, 1B and 1C into evidence.
JUDGE CARD: And one -- Exhibit 1 reflects the motions to strike and the rulings on that. Is that correct?
MS. PERALES: That's right.
JUDGE CARD: Okay. Any other objections?
MR. DIETZ: No objection.
JUDGE CARD: 1, 1A, 1B, 1C are admitted.

Page 936

(Hutto Citizens Group and The Heritage on the San Gabriel Exhibit Nos. 1, 1A, 1B and 1C admitted)
MS. PERALES: I'll pass the witness.
JUDGE CARD: Okay. I believe -- Dr. Evans, any questions for Dr. Borrer?
MR. EVANS: No. I pass the witness.
JUDGE CARD: Ms. Fox.
MR. FOX: Pass the witness.
JUDGE CARD: I believe Mr. Dunbar would be next.
MR. RILEY: He said that he wanted to know how long this was because he was going to take a call; so I assume he has no cross-examination.
JUDGE CARD: Okay.
MR. RILEY: He did speak with me about it.
JUDGE CARD: Okay. We'll go ahead and -- he's not here; so -- Mr. Ekoh.
MR. EKOH: We pass the witness, Judge.
MR. DIETZ: Mr. Dietz or -- Mr. Dietz.

CROSS-EXAMINATION

BY MR. DIETZ:
Q Mr. Borrer, my name is Mark Dietz and I represent Williamson County. And although I attended

Page 937

your deposition, we didn't meet at that time.
I have a few questions for you relating to your testimony that you gave by direct testimony and also relating to the testimony that you gave when your deposition was taken. Do you understand?
A Yes, sir.
Q Now, let's start with the purpose of your testimony as I understand it from your direct testimony.
Your purpose is to discuss what you consider to be issues associated with the future growth of Hutto. Is that correct? The Hutto ISD.
A In part, yes, sir, and to basically give testimony to the growth of the district and the expansion of the district and so forth. Yes.
Q And as I understand your testimony, that is primarily concerned with the tract that has been purchased from the Wallins, a 100-acre tract which is going to be the site of a high school in the next five to seven years.
A In relation to that tract and just growth in general in that area of Hutto.
Q Now, I understand that that tract of land that you had discussed in your deposition testimony and your direct testimony was just purchased. Is that

Page 938

correct?
A We just closed last week. Yes, sir.
Q And you also obtained a first right of refusal for an additional 50-acre tract adjacent to that 100-acre tract.
A Yes, sir.
Q And as I understand it, you came to the district in about May of 2005.
A Yes, sir.
Q And your negotiations on this tract of land began in March or April of 2007.
A Approximately. Yes, sir.
Q And at that time that you began the negotiations, you were well aware of the existing landfill.
A Yes.
Q As a matter of fact, at the time you began the negotiations, the school board had already passed a resolution relating to the -- your participation in these proceedings.
A Yes, sir.
Q Now, you knew, at the time that you began those negotiations, that the landfill, as it existed, had a life of between 25 and 50 years.
A Yes, sir.

Page 939

Q And that's without any expansion; you could expect that landfill to be there for another 25 to 50 years.
A Yes, sir.
Q As I understand your testimony, at the time that you began this negotiation, there were other sites, but you can't recall where those other sites were as it relates to the location of another high school site.
A We had other sites that we looked at, yes, sir, as far as the cost and other considerations of those sites, but, no, I don't know the actual locations of the sites. They're not something that I kept track of because I -- I assist in that and we do have -- we work with a realtor and my director of finance -- or my director of business and operations generally is the person who negotiates and begins to seek those sites.
Q Well, you told us at the time of your deposition you couldn't even recall those other sites. Do you remember that?
A Yes, sir.
Q And you also told us that you had no records of any of the other sites.
A We keep no records of -- other than the

Page 940

visual, that we go and look at, and, you know, what the cost per acreage may be.
Q It was this site that you focused on for acquisition. You'd agree with me on that, don't you?
A Yes, the site we purchased.
Q And in order to purchase a piece of real estate on behalf of a school district, there has to be a negotiation that takes place between the owner and the purchaser, or the school district.
A Yes, sir.
Q And that negotiation must be made through the school board on your side of it. Isn't that true?
A Yes, sir.
Q And the school board did approve the purchase of this tract.
A Yes.
Q And that occurred in an open meeting. Is that correct?
A It did.
Q Now, did you receive any comments during that open meeting that were in opposition to the acquisition of this site?
A None that I recall.
Q So is it fair to say that the Hutto citizens did not have a problem with the school purchasing

Page 941

property to be -- school district purchasing property to be used as a landfill within -- I mean, as a school site within a mile of the landfill?
A I can't speak for the Hutto Citizens Group with what they felt about that purchase.
Q But they had an opportunity to come and express their opinions at that school board meeting.
A Yes, sir.
Q As did any other citizens.
A Absolutely.
Q And no one came to the school board meeting and said "Don't do this, School District. We think this is a bad idea."
A No, sir.
Q What was the final purchase price of the Wallin property?
A Approximately -- I think the total was $1.5 million, $15,000 an acre for the hundred acres.
Q Now, at the time that you were negotiating this, you realized that other land that was possibly available for school sites ranged between 22- and $50,000 an acre, didn't you?
A Sites that we have looked at and were elementaries in other areas, yes, sir, those were some of the prices per acreage.

Page 942

Q And you got a favorable price per acre on this tract of land.
A We did.
Q And in addition to that, you had an agreement with the landowner, the Wallins, that you're going to assist them in building out a 220-acre subdivision immediately adjacent to the school site.
A I don't believe that that was the actual agreement. I think it was we would consider being good neighbors and help with considerations along that. I'm not sure exactly how the contract read, but --
Q Well, it was more than that, wasn't it, sir? Wasn't it the agreement that you were going to assist in water and wastewater development connections between the two tracts?
A It probably was. Yes, sir. I don't have the contract in front of me.
Q And didn't the contract also state that you were to cooperate as much as possible in the development of that tract?
A Yes, sir.
Q And isn't it beneficial for a landowner to have a school site immediately adjacent to their tract of land; it helps them sell their property?

Page 943

A It would be in most cases. Yes, sir.
Q Now, at the time your deposition was taken, you told us that you had an appraisal of the Wallin land. Isn't that true?
A I believe I may have mentioned that. Yes, sir.
Q And we've asked for a copy of that appraisal to be produced. Isn't that true?
A I believe you have. Yes.
Q And you've never given it to us.
A We -- there's not one that exists.
Q And have you gone to the realtors to ask the realtors for that appraisal?
A No, sir.
Q Why haven't you?
A Because it was one that was requested from the school district that we didn't have.
Q Did you talk to your business manager about that appraisal?
A Yes, sir, I did.
Q We know, based on your testimony, that the appraisal had no mention of the fact that a landfill was anywhere close to the property affecting the value. Isn't that what you told me -- or told Mr. Riley in your deposition?

Page 944

A Say that one more time.
Q The appraisal made no mention of the fact that there was a landfill immediately adjacent or that --
MS. PERALES: Objection, Your Honor. I believe that Williamson County has moved to strike any issues related to property values, and this line of questioning appears to directly relate to property values.
MR. DIETZ: I think the -- Your Honor, if I may respond.
JUDGE CARD: Yes.
MR. DIETZ: It relates to appraisal value as it may impact the tax value of tracts that are immediately adjacent to the landfill rather than the value associated with this particular tract; they're two separate theories.
I will go on. I don't think that there's any particular note. It's just something that he had mentioned during his deposition.
JUDGE CARD: Okay. Yeah, if you'd move on, I think Ms. Perales is right.
MR. RILEY: Give us one second.
(Brief Pause)
Q (By Mr. Dietz) Now, the school board has

Page 945

made a decision, by virtue of its resolution, to participate in these proceedings. Is that correct?
A Well, the resolutions didn't specifically mention that, but through our involvement with the Hutto Citizens Group, we became involved in the proceedings.
Q Now, you've not previously worked at a school district that had schools in close proximity to a landfill, have you?
A No, sir.
Q In fact, your only source of experience with schools and landfills would be the information you have obtained while being employed at the Hutto Independent School District.
A Yes, sir.
Q And you haven't taken any sort of a land use class, have you?
A I have not.
Q And so you're not qualified to opine on the relationship between landfills and schools, are you?
A I am not.
Q And any opinions you express in your prefiled testimony regarding land use are based on speculation.
A Based on speculation and information that we've been able to gather through presentations from

Page 946

outside groups.
Q And the presentations from outside groups, as I understand it, are presentation made by Mr. Gregory. Is that correct?
A Mr. Gregory made a presentation to our school board. Yes, sir.
Q And a presentation made by the Hutto Citizens Group. Is that correct?
A Yes, sir.
Q Have you reviewed the permit application prior -- since the time that your deposition was taken?
A Not really. No, sir.
Q Now, before we go much farther, Mr. Borrer, I am surprised that you have not corrected your prefiled testimony based upon the issues that were raised by the News 8 report regarding your having a fraudulent or substandard Ph.D.
MS. PERALES: Objection, Your Honor. This is completely irrelevant, and, frankly, it's inadmissible testimony -- or questioning.
MR. DIETZ: It goes to his credibility, Your Honor.
MS. PERALES: Your Honor, the Texas Rules of Evidence do not allow for credibility or

Page 947

impeachment of a witness based on instances of conduct that do not result in a conviction.
MR. DIETZ: Your Honor, he has represented to this Court that he holds a Ph.D. Under the Texas Education Code, he does not; as a matter of fact -- for the fact that the law changed such that it became a criminal offense on September 1, his actions in obtaining his job would be subject to criminal prosecution. I'm not going there, but I do think the credibility of this witness by coming to this Court and telling this Court he has a Ph.D. when he does not is of import, and I think I'm entitled to proceed.
MS. PERALES: Your Honor, if I may respond. Irrespective of Mr. Dietz's opinions regarding the import of Mr. Dietz's -- or Dr. -- I mean -- sorry -- Dr. Borrer's Ph.D., the rule is clear in Texas, that unless a specific act or piece of conduct resulted in a conviction, there is no questioning allowed to impeach a witness regarding specific instances of conduct.
MR. DIETZ: I don't think this is misconduct. I'm not alleging it as misconduct. And, in fact, if I would have been allowed to elicit the testimony, it is only a question of whether or not he properly addressed this Court by telling the Court he

Page 948

was a Ph.D.
MS. PERALES: I didn't say "misconduct." I said "conduct." The rule does not allow questioning about specific instances of conduct in order to impeach a witness unless it resulted in a conviction.
JUDGE CARD: Okay. Where are you looking, Ms. Perales? We're going to have to take a second on this one.
MS. PERALES: I'm looking at Rule 608, Subsection (b).
JUDGE CARD: Off the record for a moment.
(Discussion off the record)
JUDGE CARD: Okay. We're back on the record.
We'll overrule the objection to the extent -- Mr. Dietz, you can ask him whether he's got a Ph.D. and ask around that. As far as going into a long thing about it, I don't want to hear that.
MR. DIETZ: I understand that.
JUDGE CARD: Any news reports, all that stuff, we're not interested.
Q (By Mr. Dietz) Mr. Borrer, you do not have a Ph.D. that's recognized by the Texas Education Code, do you?

Page 949

A I don't know what the Texas Education Code refers to as being "recognized." My degree is a state-certified degree from Louisiana. It is accredited through the State of Louisiana.
Q It's not accredited in the state of Texas, is it?
A No, sir.
Q As I understand the testimony that you gave at your deposition, Mr. Gregory approached you about making a presentation to you and your administrative staff about problems with the Williamson County landfill. Is that correct?
A No, sir. The presentation was what a landfill could possibly look like in another format.
Q There was a presentation made to you and your administrative staff. Is that true?
A Yes, sir.
Q And you determined that it was important enough to have that same presentation made to the school board.
A Yes, sir.
Q And that presentation was made prior to the time the school board passed its resolution to initiate your participation in these proceedings.
A It was passed prior to the purchase of the

Page 950

land and prior to me being involved here. Yes, sir.
Q The date of the resolution is January the 28th, 2007. Isn't that correct?
A Yes, sir.
Q And in our request for discovery, we asked for copies of that presentation that was made to your administrative staff. Is that correct?
A Yes, sir.
Q We also asked for copies of the presentation that was made to the school board. Is that correct?
A Yes, sir.
Q And you've not produced any such copies.
A As I recall, the presentation was brought by Mr. Gregory and we could not find the hard copies that were -- if any existed; so we had nothing other than what was brought by Mr. Gregory and taken away by Mr. Gregory.
Q Did you ask any of your school board members whether or not they had copies?
A I did not.
Q Wouldn't you have thought that would have been a good idea?
A I don't believe they existed.
Q But you didn't make inquiry from your school board?

Page 951

A I did not.
Q Let's turn our attention to your prefiled testimony. Do you have it there before you?
A Yes, sir.
Q As I understand, you have specific concerns that are identified on the last page of your prefiled testimony. There were six and I think we're now down to five after having one of them being struck. Find those?
A Yes, sir.
Q The first, as I understand it, it would be an unsightly neighbor which would distract students and be unappealing to families interested in moving to the area. Is that correct?
A That's the first one. Yes, sir.
Q And when we asked you about why it would be an unsightly neighbor, you indicated that you were concerned about the height of the proposed landfill.
A Yes, sir. I believe I did.
Q Do you know what the permitted height of the current landfill is?
A I believe it's 140 some-odd feet.
Q And at the time your deposition was taken, you didn't know for certain, but you told me -- or Mr. Riley, it was 150 feet.

Page 952

A I believe I did. Yes, sir.
Q Now, you can't see the existing landfill from any of the Hutto schools, can you?
A I would say no. I -- but I haven't really began to look at the landfill from each campus.
Q And you believe that the current height of that landfill is approximately 50 to 60 feet. Is that correct?
A Yes, sir. I believe that's what I had mentioned.
Q And what I understood from your testimony is you are concerned about the dramatic change that would occur if this landfill permit expansion was allowed that would dramatically allow a 700-foot or perhaps even a 750-foot landfill to be constructed. That was what you told me.
A Yes, sir.
Q And your concern was based upon information that you received from Texas Disposal Systems or Mr. Gregory about what they had learned from Waste Management as to how high it was going to be.
A Well, I'm not sure if I related it to what they had learned from Waste Management. It was from the presentation.
Q It was from something in the presentation.

Page 953

And at the time your deposition was taken, you said Waste Management had said it was going to be 750 feet high. Isn't that what you told us in the deposition?
A I'm not sure if I said that. If I said that, it wasn't meant to -- it wasn't meant to come across that way because I'm not sure what Waste Management had told anybody.
Q If I may give you a copy of your deposition. Let me turn your attention to Page 107 of your deposition -- down about -- halfway down that page, do you see that -- in which I believe you were discussing with Mr. Riley that Waste Management has indicated it would grow as high as 750 feet. Do you see that?
A Yes, sir.
Q That's what you told us at that time.
A Yes, sir.
Q But you --
MS. PERALES: Sorry. What page are you on?
MR. DIETZ: On Page 107, starting on Line 8 and extending through Line 12.
JUDGE CARD: Hold on a second.
(Brief Pause)
JUDGE CARD: Are you there, Ms. Perales?
MS. PERALES: I am there.

Page 954

Q (By Mr. Dietz) Now, you've never spoken with anybody from Waste Management, have you, about the height of the landfill?
A I have not.
MR. DIETZ: If I may approach and draw something, Your Honor.
(Brief Pause)
Q (By Mr. Dietz) Mr. Borrer, do you understand the difference between mean sea level and ground level?
A Yes, sir. Reasonably.
Q All right. Well, I'm going to tell you that -- based upon information I have, that the ground level out at the landfill is approximately 700 feet MSL. So this is ground level and I'm going to say this is 700 MSL. It varies out at the landfill, a little lower, a little higher, but I'm going to draw what I'm going to refer to as a "landfill-o-graph," because we've been discussing hydrographs and I thought it would be appropriate we keep in that same text.
So what you understand the current height of the landfill to be is approximately 50 feet. Is that correct?
A Yes, sir.

Page 955

Q All right. So I'm going to label that as "50 feet."

And then what you have told us at your deposition is you think that it's currently permitted to go up to 150 feet right now. Is that right?

A Yes, sir.

Q And so over the next 25 to 50 years, if there was no permit expansion, this is how high it would go. Is that correct?

A Yes, sir.

Q And your concern is -- I may not have gotten myself enough paper here. The exhibit is going to go all the way up here to 700 to 750 feet. Is that correct?

A Yes, sir.

Q And that's something that you believe could occur?

A It was presented as a possibility that that could occur. Yes, sir.

Q Next to you on the top of the exhibit books that are in a box, will you pick up that one that's laying on the top? I think it's 1 of 5.

A This one you're referring to?

Q Yes, sir. And would you turn to Page 20?

A (Witness complied)

Page 956

Q And if you would, look at the 1.2, the second paragraph. Do you see that?

A Yes, sir.

Q Do you see where it says, "The vertical expansion will increase the maximum height of the landfill from its current permitted height of 766 feet mean sea level" -- in other words, right about where you say it is right now, 16 feet higher than the 50 feet you think -- "to approximately 840 feet MSL"? So taking --

MR. DIETZ: Again, if I may approach and build on my "landfill-o-gram" -- graph.

Q (By Mr. Dietz) The permit, if you will agree with me, will take it right to there (indicating). Is that correct?

A The permit, as I understand it, yes.

Q That's what you read right there?

A Yes, sir.

Q All right. Approximately 140 feet above ground level. Is that right?

A Yes, sir.

Q Not 7- to 750 feet.

A Yes, sir.

Q Has anybody ever showed you that page before?

A I've not seen that page. No, sir.

Page 957

Q If I tell you that this page has been in existence for several years and that it was available to anybody that came to the school board to talk to the school board about the height of the landfill, would you be shocked to think that they might have misrepresented things to you?

A I don't feel that it was -- been misrepresented, but if this was available and it was presented to me, then it was not understood exactly by me or our school board exactly what that was referring to, I would assume.

Q And to review, what you've been told, the Hutto Independent School District made its decision to oppose this landfill expansion based upon a misrepresentation of fact. Isn't that true?

A That's the -- that is not the reason -- the complete reason that the school board or Hutto ISD has had issues with the expansion, because it may potentially go to 700 feet.

Q That's just one. And we've got others we're going to talk about here in a minute.

A That would be a concern. Yes, sir.

Q All right. And as it relates to this concern, do you now think it would be appropriate to withdraw your testimony about it being an unsightly

Page 958

neighbor since you completely misunderstood the height of the landfill?

A Well, I think there's -- can be concerns about the proposed expansion as far as the doubling of the height. The existing height and the doubling of the existing size would still create some concern that the district would have.

Q Well, do you remember what you told me at your deposition -- Mr. Riley at the deposition, that the existing permit would take it to 150 feet and now you've learned that this expansion permit will only take it to 140 feet above ground level? So it doesn't really double the height based upon what you understood and your school board understood, does it?

A No. We understood what the permit was going to allow, which essentially doubles the size to what it could be, but we also heard that there is a propensity that that could increase as well.

MS. PERALES: Your Honor, if I may interject. I think one of the things that's causing confusion here is that when -- Mr. Dietz, when you're talking about the existing permit, there's some confusion over whether you're talking about the existing draft permit, the draft permit that's proposed in this hearing.

Page 959

MR. DIETZ: All right. Let me clarify that.
Q (By Mr. Dietz) When I say "the existing permit" and what you were asked about in the existing permit, you were talking, I understood, about that 50-foot level that you see now, and what you understood, it could go to 150 feet under the existing permit.
A Well, under what the -- under the -- the information given by the Williamson County fact sheet, to grow to 140 --
Q And at some point during --
A -- some-odd feet.
Q Excuse me. I'm sorry.
At some point during that discussion, you came to believe that it could grow to 700 to 750 feet above the ground level.
A We were presented information that that is a possibility. Yes, sir.
JUDGE CARD: Dr. Borrer, if you can speak up a little bit.
A Yes. I said --
JUDGE VICKERY: And you may want to pull that mic a little closer.
Q (By Mr. Dietz) And you did not do any

Page 960

independent research of any of the information provided to you by Texas Disposal Systems or Hutto Citizens Group or TJFA about what they were telling you as far as the extended height going to 700 or 750 feet?
A The school district did not do any independent studies. No, sir.
Q Now, earlier you told me that in a discussion with Mr. Gregory and your administrative staff, that he told you what a landfill should or could look like, and that included screening of a landfill by industrial sites. Is that correct?
A Yes, sir. Reasonably.
Q I'm going to show you a picture of a landfill, and I'm going to mark this as Applicant --
MR. DUNBAR: Your Honor, I'm going to object to Mr. Dietz's characterization of this picture, that -- and see if the witness could identify it rather than --
JUDGE CARD: Well, I'm going to let him mark it, and we'll see. Yeah.
MR. DUNBAR: Okay. That's fine.
JUDGE CARD: We'll see if he can identify it or not, because I see where you're going, but --

Page 961

MR. DUNBAR: Thank you.
MR. DIETZ: Let's make this Applicant No. 602.
JUDGE VICKERY: Let me ask you this -- let's go off the record.
(Discussion off the record)
(Exhibit No. APP-700 marked)
JUDGE CARD: All right. Go ahead.
Q (By Mr. Dietz) Exhibit No. 700, I'm going to represent to you, is a picture of a landfill. Is this the type of --
MR. DUNBAR: Objection, Your Honor. I don't think he can represent anything. I think he needs to ask the witness if he is familiar with or recognizes what this picture is.
JUDGE CARD: Well, I'll let him say that. And whether it actually has any evidentiary value or not, I'll let him make that representation and see where we get from there.
Q (By Mr. Dietz) Is this the type of activity that -- or landfill that you think should be screened by an industrial park?
A I'm assuming this is a landfill.
Q Yes. You take my representation on that. Is this --

Page 962

A And you're asking me --
Q Is this the type of thing that you should -- think should be screened by an industrial park?
A And my reference on our deposition when I was talking about industrial park, it was more -- not necessarily along the lines of screening as it was about what other impact that an industrial park would have in the district.
Q Did you understand from Mr. Gregory that a landfill should look better than that type of landfill that you see there on that picture?
A What I understood from Mr. Gregory was that a landfill could have some economic impact on our district as well as our community if done through other processes.
Q And so that type of appearance is not offensive to you as a landfill could or should be operated, as represented in Picture No. 700 -- or Applicant 700?
A Are you asking if this type of appearance is --
Q Offensive to you.
A Is offensive to me?
Q Yes.
A Individually?

Page 963

Q As -- on behalf of the school district. That's how I understand you to be here. Do you think that's offensive to you?
A I've seen worse; I've seen better. If I were to look at that and want to see something different, I'd prefer to see something a little more sightly.
MR. DIETZ: This will be 701.
(Exhibit No. APP-701 marked)
MR. DIETZ: I think I've got a bigger one of this one for you to look at.
Q (By Mr. Dietz) What I've marked as APP-701 -- same question: Is this the type of landfill that you would feel would be offensive and distracting?
MR. DUNBAR: I'm going to object, Your Honor. Mr. Dietz is inferring that this picture is a photograph of a landfill.
MR. DIETZ: Well, I --
MR. DUNBAR: If he makes that representation, that's fine.
MR. DIETZ: I make the representation that this is a picture of a landfill.
A Again, I would go back to my last statement, that I've seen worse; I've seen better, but it would not be as attractive picture of a -- representation of

Page 964

a landfill.
Q (By Mr. Dietz) And based upon your experience, how high is the rise from ground level to the top of that landfill? If you know.
A I don't know.
Q Okay. Have you visited the Texas Disposal System landfill?
A I have.
Q Have you seen this to be the Texas Disposal System landfill?
A The part that I was at, that doesn't look like the Texas Disposal System landfill, but then I went to the -- to a function there that was in another location from that. And we're talking about the Creedmoor --
Q Correct.
A -- the one that I attended?
Q Correct. And as I understand your testimony, you were invited there by Mr. Fowler.
A I believe so. It was -- it's been a couple of years ago. I can't remember, but I believe Mr. Fowler was the one who invited me.
Q And did you know or understand that Mr. Fowler or his company is a consultant to Texas Disposal Systems or TJFA?

Page 965

A I don't believe at that time he was, but I wasn't invited there individually. Our school district was invited there and we had went to attend a ceremony that happened to be on that location.
Q You now know he is a consultant?
A Yes, sir.
Q Now, the current Williamson County landfill has not been a distraction for the Hutto students, has it?
A I can't speak for the students as far as a distraction of landfill.
Q Didn't you tell me that it was not? Isn't that what you told me in your deposition on Page 118, Line No. 5? Do you want to look at your deposition?
A What page?
Q Page 118, Line 4, actually, where I asked you the question, "Has it been a distraction to the students so far," and we were talking about --
JUDGE VICKERY: Mr. Dietz.
MR. DIETZ: I'm sorry.
JUDGE VICKERY: I'm watching Ms. Perales to make sure that she's there.
Are you there?
MS. PERALES: Yeah. I am there, and I just want to make a correction. I don't believe it

Page 966

was you that asked the questions.
MR. DIETZ: You're correct.
Q (By Mr. Dietz) Mr. Riley asked the questions. And if I say "me" --
A I understand.
Q -- at any point, I mean this guy, too.
A I understand.
(Laughter)
JUDGE CARD: The collective you.
(Laughter)
MR. RILEY: I'll sit right behind him. That way --
(Laughter)
Q (By Mr. Dietz) At the time your deposition was taken, you told me that -- or told Mr. Riley that it had not been a distraction to the students so far. Is that correct?
A That's -- that's -- yes, sir.
Q And you also said that you didn't have any evidence that the expansion would create a distraction for the students other than speculation.
A Yes, sir.
Q I think that's pretty much it on Item No. 1.
Let's go on to Item No. 2 on your prefiled testimony, and that has to do, I believe,

Page 967

with odors. Your testimony is "Unpleasant odors may disrupt outdoor activities held on school grounds."
A Yes, sir.
Q And I'm assuming this will be on the school grounds on the property that your school district bought knowing a landfill was going to be across the road.
A Well, I'm speaking more generally of any future site that we may have in that location and anyone that may be close to it.
Q Now, you don't live anywhere close to the existing landfill, do you?
A Me, personally?
Q That's correct.
A I probably live within five miles. I'm not sure if that's close.
Q You live on the other side of the town of Hutto and on the other side of Highway 79 and south of the high school.
A Yes, sir.
Q And, in fact, you don't even pass by the existing landfill but infrequently. Isn't that true?
A Again, relative to what "infrequent" means, I -- you know, I have, on several occasions, passed by it, but it's not on my way to work.

Page 968

Q And you -- I think during your testimony at deposition you said you pass by it infrequently.
A (No verbal response)
Q Now, have you reviewed any of the testimony of the other prefiled protestants?
A No, sir.
Q So you aren't aware that Dr. Evans has testified that -- in this lawsuit that's currently pending, that complaints that he made to the Commissioners, after those were made, a flare was installed that quite reduced the foul odors at that point considerably.
MS. PERALES: Objection, Your Honor. Dr. Evans has not yet testified in this matter.
JUDGE CARD: I'll overrule that. We anticipate it and we've -- he can ask whether he knows about that or not.
MS. PERALES: Okay.
A I'm not familiar with any testimony that was given by Dr. Evans.
Q (By Mr. Dietz) Are you aware of the general knowledge that he says that after February or March of 2005 the odors around the landfill were reduced significantly?
A No, sir.

Page 969

Q No one has ever told you that?
A I'm not aware of that.
Q And the first day that you had on the job was in May of 2005. Is that correct?
A Yes.
Q Now, have you -- I think you've told me you have not reviewed the permit. Is that true?
A I have not read through the entire permit. No, sir.
Q So you have no reason to believe that the policies and procedures that are set forth in the permit wouldn't control the odors as you might be concerned about; you don't have any knowledge of that one way or another?
A I have no knowledge of that. No, sir.
Q Based on what I've just told you, don't you think it would be appropriate to remove this portion of your testimony from your prefiled testimony?
A I just know that odors exist currently, and whether they come from the landfill or not, I don't know, but there is a strong opinion that they may.
Q Okay. It's just speculation.
A It's speculation.
Q All right. Concern No. 3 in your prefiled testimony had to do with "transportation issues with

Page 970

school buses having to share the roadways with vehicles transporting waste. The routes chosen by trucks carrying waste could conflict with routes our buses take." Is that right?
A Yes, sir.
Q Now, we both understand that the population growth around Hutto has caused an increase in traffic. Isn't that an agreement we can make?
A Yes, sir.
Q And you're not aware of any instance in which a garbage truck has collided with a school bus in Williamson County, are you?
A I'm not aware of any. No, sir.
Q And you would also agree with me that traffic incidents or accidents are just a function of people driving cars?
A I would assume that, say, a particular -- one of the functions. Yes, sir.
Q And you don't have any evidence that there's a greater frequency of accidents in the population of garbage trucks than any other population of vehicles, do you?
A I have no way of producing that. No, sir.
Q Is there anything that you can point to that says that garbage vehicles on an average or a

Page 971

frequency level are in any way different from the population of vehicles at large?
A There's nothing that I can point to from anything that I'm aware of. No, sir.
Q And you would agree that the population growth in and around Hutto has greatly led to the increase of construction vehicles on the road. Isn't that true?
A Yes.
Q And there are currently significant number of construction vehicles or trucks on the roads in and around Hutto.
A There are.
Q And that you expect to continue. Isn't that true?
A Yes.
Q The continued operation of the landfill for at least another 25 years coupled with the increase in population would increase the number of garbage trucks and the number of construction vehicles on the road, would it not?
A Yes.
Q So it's not the growth of the landfill but the growth of Hutto in general that's going to affect traffic in and around the landfill. Isn't that true?

Page 972

A Growth in general in Hutto will be affected by construction and the growth of the landfill.
Q It's not just garbage trucks; it's construction vehicles and other traffic --
A Yes.
Q -- we have.
And all of those could cause conflict with school buses.
A Absolutely.
Q So would you agree with me it would probably be appropriate to delete that portion from your prefiled testimony?
A We still have a strong opinion that the increased amount of activity from the proposed expansion of the landfill would be a safety issue. It's not the only safety issue we have. We have other safety issues in the district as well in regards to transportation, but it is still a concern that we have. Yes, sir.
Q And that opinion is not based upon any study, is it?
A It's not based on any study.
Q And it's not based upon just the natural fact that traffic increases with population.
A It's based on the fact that we have a strong

Page 973

concern about the safety of our children and anything -- whether it's garbage trucks, whether it's construction trucks, whether it's increased automobiles, it's a concern that we have.
Q Okay. But you haven't done anything to petition that construction vehicles be removed from the road, have you?
A We are concerned about the issues that are in regards to construction --
(Interruption)
THE REPORTER: Wait. About the issues that what?
JUDGE CARD: If you could speak up a little bit. We've got that -- speaking of construction, we've got that going on. You need to speak up a little more.
A I'm sorry, Mr. Dietz. Ask me that one more time.
Q (By Mr. Dietz) Well, you have not done anything to stop the use of construction vehicles in and around the schools of the Hutto ISD, have you?
A Have we passed a resolution that shows our interest and concerns against anything? We have not.
Q Now, we were talking about deleting items from your testimony. Perhaps there is one that we

Page 974

possibly can agree on, and that has to do with Exhibit 1C to your testimony. That's the City of Hutto Growth Guidance Plan. And that was something that had nothing to do with Hutto ISD, did it?
A No, sir. Not in regards to anything that we participated in.
Q It is only a document that was used by the Hutto Citizens Group counsel and perhaps the Hutto Citizens Group. Isn't that true?
A I don't know how it was used other than the fact that it was done, I believe, before I even got to my position in Hutto.
Q Wouldn't you agree that Exhibit C doesn't have anything to do with you?
A Exhibit C, it was not used in any form or fashion from Hutto ISD to track or project student growth in our district.
Q And you -- don't you agree it should be removed from the testimony that you give in this matter?
A As far as I'm concerned, it doesn't concern me.
Q Let's turn to Exhibit -- I mean, Item No. 4. "Public safety concerning transportation is an issue." And in this instance, as I understand it, the concern

Page 975

is students driving to and from school will be on roadways with more vehicles transporting waste, and as new drivers, they could become involved in accidents; and pedestrian safety is a concern also.
A Yes, sir.
Q Has there ever been any instance that you're aware of, the time you've been at Hutto, with a waste vehicle or a garbage vehicle colliding with a new student driver?
A None that I'm aware of.
Q And we just discussed the fact that the Hutto ISD is not opposed to construction vehicles that regularly ply the roads in and around your schools to assist in the protection of the new student drivers, have they?
A We have concerns about those. Yes, sir.
Q You have concerns but you haven't passed a resolution.
A We have not passed a resolution on any of those.
Q Now, the landfill is situated on Highway 1660 -- is that correct -- just off of 1660?
A I believe so. Yes, sir.
Q And the new school that you propose to build in five to seven years is on the same road, 1660.

Page 976

A Yes, sir.
Q Do you know what the current speed limit on 1660 is?
A I don't have -- no, sir. I don't have it -- knowledge of that right now.
Q Would you consider 1660 a pedestrian-friendly right of way?
A I don't know that it's necessarily pedestrian friendly, but it's -- it's a major artery in Hutto and that is a major road for our transportation of students.
Q The school and -- the school board and its consultants would have control over the design and construction of ingress and egress to this new school site, wouldn't they?
A Yes.
Q And wouldn't you agree that based on what you've told me as far as safety concerns, that it would be incumbent upon the school or its consultants to assure that its pedestrians and/or student drivers would have safe ingress and egress into that school site? Wouldn't they?
A That would be our top priority.
Q Now, that's something the school district has responsibility for, isn't it?

Page 977

A It is.
Q So based upon what we've now agreed is a school district responsibility, don't you believe that Item No. 4 should come off of your testimony?
A I think it's everyone's responsibility for the safety of kids. I'm ashamed that the county wouldn't think that.
Q There's an existing landfill out there for 20 to 20 -- 25 to 50 years. Is that correct?
A Yes, sir.
Q Even without this expansion?
A Even without the expansion.
Q And there's going to be increased traffic to that landfill based upon population. We've already discussed that.
A Yes.
Q And we've already discussed the fact that you're going to be responsible -- meaning the school district is going to be responsible -- for protecting those kids at or around that school site because they've chosen to put that school site there. Isn't that true?
A We will do everything within our power to protect the safety of our students and we would appreciate the county being involved with that as

Page 978

well.
Q Let's turn your attention to the last item, and that is: Scavengers, such as vultures, may act as further distractions for the school children or for students.
You've not seen any scavengers at the existing landfill, have you?
A Do I see vultures at the existing landfill?
Q Well, it -- in fact, you told Mr. Riley during your deposition you had not seen any scavenger birds at the existing landfill.
A Well, is that what I said?
Q Well, if we want to look at your deposition, Page 141.
JUDGE CARD: Let's let Ms. Perales get there, too.
MS. PERALES: What page?
JUDGE CARD: 141.
MR. DIETZ: 141.
Q (By Mr. Dietz) You see there on Line No. 4 where you were asked -- you're talking about all types of scavenging types birds, and the question was put to you, "Do you see them at the current operations at the Williamson County landfill?" And what was your answer?

Page 979

A I said, "I do see scavenger types" -- "do I see scavenger types of birds? I haven't" -- "I probably haven't seen enough that it becomes a huge -- it doesn't ring in my mind."
Q So the next question: "So is it fair to say, then, under the present conditions and operations you have not experienced the phenomena that you're concerned of with vultures?"
A "Under the" -- well, no. I said that I have seen those and it is a concern.
Q What did you see -- just -- let's read through your deposition and let's --
JUDGE CARD: If you would read the deposition answer real quick and then you can explain.
Q (By Mr. Dietz) What was -- the next question (sic) was: "Under the current conditions?"
A "Do I see scavenger types of birds? I probably haven't seen enough that it becomes a huge -- it doesn't ring in my mind."
Q And the next question put to you, "So is it fair to say that under present conditions and operations you have not experienced the phenomena that you're concerned of with vultures?"
A And I say, "Under the current conditions?"
Q "Yes." And then your answer?

Page 980

A "I have not -- I have not had reason to see that as a big issue."
Q And --
A Under the current conditions.
Q And so based upon that testimony, you were then asked whether you had any basis that more waste attracts more birds other than speculation, and you said again it would just be speculation. Isn't that correct?
A Yes.
Q Well, now let's turn our attention back to what you have by prefiled. You don't have any experience at the Williamson County landfill that would suggest this. Isn't that true?
A Any experience that would suggest that --
Q Scavengers are at that landfill.
A Well, I have experience that it's a landfill, and, by nature, that's what happens.
Q But as your experience with the Williamson County landfill, that has not occurred?
A I have seen -- I have seen scavenger types of birds, but not to the extent, under current conditions, that has raised a big issue with me.
Q And it would be pure speculation to think that it would change. Isn't that what you told

Page 981

Mr. Riley?
A I think it would be a logical speculation that that could exist in a -- in the expansion, but I have -- it's only speculation.
Q It wasn't logical. As a matter of fact, Mr. Riley asked you, "Do you have any basis for that?" And your answer was, "No, sir."
A And I said it would be just speculation. I'm saying that right now.
Q Based upon the fact that you're speculating, don't you think it would be appropriate for you to withdraw that line from your testimony?
A I still believe that there are concerns of scavengers and other types of vultures and unattractive types of animals that in the expansion of the landfill could create unpleasant situations for our school district.
Q Again, just speculation.
A It's just speculation.
Q We've discussed all five of these factors, and all of those factors together did not override the Hutto Independent School District decision to purchase this property, this 100-acre site, did it?
A Mr. Dietz, these are two separate issues.
Q Just answer my question first. Your lawyer

Page 982

may have -- but it didn't override --
A It did not override our decision to purchase land in the location that we purchased it.
Q If it wasn't important enough for the Hutto Independent School District to make a different decision, then it shouldn't be important enough for the TCEQ to make a different decision about the expansion of the landfill. Isn't that true?
A As I had mentioned, we are talking about apples and oranges in regards to our purchase of -- and the location of our purchase and our issue with the landfill.
Q If you had put your school site some place else, this would not have been as much of an issue for the Hutto Independent School District. Is that true?
A Based on the fact that our school district is expanding to the north -- and you've seen that in the demographic study that we have provided for you -- somewhere -- if it wasn't on that location, somewhere else around the landfill, we would have been forced to purchase land. That issue would exist whether it's in the current location that we purchased or somewhere else where we had purchased.
Q And that would have been true even without this expansion?

Page 983

A We can't do anything about the current landfill. It's there. We can't do anything about the expansion of Hutto and Hutto ISD's -- as far as our student growth and location, but this has given us the opportunity now to express our concerns to the county, which, by the way, nobody from the county or from Waste Management ever approached the school to give us any information. We've been left to get information from concerned citizens, which we listen to our constituents and we do try to get information of concern from them; whereas, no one from the county has bothered to come to me and talk to me about this situation.

Q And, equally, you have not done anything to investigate on your own, have you?

A I don't use my taxpayers' money in areas where someone who should be a good neighbor -- I'm talking about our county -- should come and give me information if they see it's negative from what I'm hearing.

Q And so if you're told a falsehood by someone that you don't know, you don't take it upon yourself to check out whether or not that falsehood is true?

A I'm not sure that I've been told any falsehoods, but --

Page 984

Q Let's go look at that "landfill-o-graph" again. Based upon what you read here today, isn't it false to say that the landfill would be 700 to 750 feet high?

A Under the application, it would be false, but under what we understood it could be, then I don't believe that's a false statement, because it was not ever presented to us as fact.

MR. DIETZ: Pass the witness.

JUDGE CARD: Mr. Humphrey.

CROSS-EXAMINATION

BY MR. HUMPHREY:

Q Is it my understanding that the school district originally got involved in this at the urging of the Hutto Citizens Group?

A Yes.

You're talking about this process?

Q Uh-huh.

A Yes.

Q Yes. This process. Right.

And when the school district was contemplating purchasing this land, you were aware of the existence of the landfill, weren't you?

A Yes.

Q So when the school district was considering

Page 985

whether to purchase the land or not, they discussed the pros and cons of purchasing this close to the landfill?

A Yes, we did.

Q So would it be fair to say that the school district decided, despite the location of the landfill, to go ahead and purchase the land because the landfill as it exists would be acceptable but the expansion would not be?

A Yes.

Q Okay. And if I may, I would like to clarify your education. It says in your prefiled that you have a Ph.D. in Education Administration from LaSalle University. Is that correct?

A Yes, sir.

Q What year did you -- I assume you completed the program. Right?

A Yes.

Q And what year did you complete it?

A I believe it was 1999.

Q What was the subject of your dissertation?

A It was effective school -- effective middle school principles in and around South Texas.

MR. HUMPHREY: Okay. Thank you very much. I'll pass the witness.

Page 986

JUDGE CARD: Ms. Perales.

JUDGE VICKERY: I actually --

JUDGE CARD: Oh. Hold on a second. Do you want to ask --

JUDGE VICKERY: Yeah. Let me -- just so we can all be wrapped up in redirect.

CLARIFYING EXAMINATION

BY JUDGE VICKERY:

Q I think the question I have about -- once again, Mr. Humphrey has touched on questions that I have, and it seems to happen in almost every proceeding Mr. Humphrey participates in and where I preside.

The question for me is this: School board is -- accepts the current landfill and accepts the idea of purchasing land for expansion of school facilities in the immediate vicinity of the landfill as evidenced by this recent purchase. Is that correct?

A If I understand what you're saying, we understood the current conditions of the landfill as a school district along with proposed expansion, and we --

Q Ignore the proposed expansion.

A Okay.

Page 987

Q What you just said to Mr. Humphrey is as the landfill exists right now under the current permit --
A Yes.
Q -- you don't -- the school board doesn't have a problem with that as far as purchasing land right next to the landfill. Is that correct?
A As it exists currently, no, sir.
Q All right. And here is -- here's a question I've had all the way through, and you may or may not be able to answer it, but based on what you just said, it's my understanding, with the growth in Hutto and Williamson County in general, traffic itself -- it's my understanding that the expansion of the landfill isn't going to have any impact on the traffic that's coming in and out because of the growth that we've talked about throughout this entire proceeding. It's just a matter of making the landfill itself bigger, but the actual volume -- my understanding is that volume, as the population increases in Williamson County, is going to increase as well. Is that -- is that accurate?
A It would be our assumption that the volume would increase. Yes, sir.
Q Regardless of the -- of this permit amendment?

Page 988

A I think the natural byproduct -- I'm not really sure I know what you're asking me, but the byproduct of the growth would be the volume increase, I think, of waste, if that's what you're asking me.
Q That is my assumption, that if we just -- if we just assume that the permit stays under its 1405A -- let's just assume it stays under 1405A. It may fill up, I suppose, to the existing parameters a bit faster, but what I understand is the volume is going to increase regardless of the permit expansion, and so if -- if the school board is okay with the current permit, 1405A, it seems like it's also okay with this increase in volume to the landfill. Is that accurate?
A Let me just get clarification on what you're asking when you say "Are we okay with current permit?" We're okay with the current conditions of the landfill. We have concerns about what the proposed permit would allow as far as the increase in the size of the landfill and the height of the landfill; so I'm not sure if, semantically, I'm understanding what you're saying, but that's basically our concern.
Q I may be missing something in the course of this proceeding. That's a perfect possibility; however, what I'm -- all I'm getting at is this: My

Page 989

understanding -- and I'm sure this will be corrected if I'm wrong, but my understanding is the growth is going to happen regardless of whether or not permit 14 -- or the permit that's being sought, the Permit Amendment 1405B happens. Regardless of whether or not that happens, there's still going to be growth.

What's been in my mind is: If that growth is going to happen regardless of the permit amendment, you're still going to have this increase in traffic and some of these other issues which I think get tacked onto the amendment itself, and, yet, are going to happen anyway. And so when you answered Mr. Humphrey's question, which is "School board is okay with buying land right next to the landfill as it is under its current permit," some of the issues that you raise in your testimony, to me, seem as if they're going to happen regardless. And that, for instance, would be this traffic safety issue, you know.

If I'm wrong, I'm sure it will be cleared up by the parties and I welcome those questions, but that's my understanding. And so I just wanted to make sure that my understanding is an accurate one. Is that accurate as far as you know?
A Is it accurate, your understanding about the issues -- I'm --

Page 990

Q It's growth. It's all about growth.
A Yeah.
Q I'm limiting it to that --
A Right.
Q -- future, "We know that it's growing."
A These issues will be a byproduct of growth to an extent. Yes, sir.

JUDGE VICKERY: Okay. All right. Thank you.

Ms. Perales.

REDIRECT EXAMINATION

BY MS. PERALES:
Q Dr. Borrer, what were the factors that the school district considered in determining where to purchase a new piece of property?
A Well, of course, the most significant factor we have is our demographic study that shows that growth in our school district is growing north of Highway 79, and so that is a predominant factor involved with our purchase of any land, is where our demographic studies show us our students are going to be. And then, of course, we want to look at, you know, the land use, what -- you know, if it's going to work for what we need for school campuses, and certainly we want to get the best buy for our money.

Page 991

Q So you mention that growth is one of the primary factors in determining where to purchase land. I assume, then, that your information indicated to you that the growth was headed in the direction of where you purchased this piece of property.
A Yes.
Q So growth was in the direction of this landfill?
A Yes, ma'am.
Q And there was some discussion about information provided by various parties or individuals to the school district regarding the proposed landfill expansion. Did anyone from the county ever make any sort of presentation or provide any information to the school district?
A No, they did not.
Q Did anyone from Waste Management ever do that?
A No, they did not.
Q Did anyone from the county ever attempt to coordinate with a member of the school district?
A No, ma'am.
Q Would the school district have provided their -- its demographic analysis to the county if the county had asked for it?

Page 992

A Absolutely.
Q And, in fact, prior to getting involved in this proceeding, have you ever had -- or outside of this proceeding, outside of this adversarial proceeding, have you ever had communications with a representative of the county regarding the landfill?
A No, ma'am.
Q Now, there was some discussion about the possibility of the landfill one day reaching over 700 feet. Did that proposition come from the citizens' group -- the Hutto Citizens Group?
A I believe -- and, again, this has been a number of months since we saw that, but that one came from the citizens' group, and it may have been in the presentation by TDS.
Q Okay. And so when it was presented from the citizens' group, was it presented as a possibility or was it presented as a fact?
A It was presented as a possibility. Never a fact.
Q And you're a member of the Hutto community, I presume.
A I am.
Q Is that right?
And so you have interactions and

Page 993

communications with many members of the community. Is that correct?
A I do.
Q And is it my understanding that you on occasion also attend the Hutto Citizens Group meetings?
A I have, on occasion, attended.
Q So in -- as a member of the community and as an attendee of the Hutto Citizens Group meetings, do you, on occasion, discuss with other people this landfill application?
A Yes.
Q And do you hear the concerns of other citizens and other members of the Hutto Citizens Group with regard to this proposed landfill expansion?
MR. DIETZ: We've now moved into hearsay, Your Honor. I'm going to have to object.
MS. PERALES: I'm asking him about whether he hears concerns. I'm not asking him about the specifics of those.
JUDGE CARD: I'll sustain.
Q (By Ms. Perales) Dr. Borrer, as -- does the school district have any control over the rate of growth or growth patterns in the area?
A No. We wish we did, but we don't.

Page 994

Q So would it be fair to say that the school district just attempts to deal with the growth?
A We attempt to deal with growth.
Q And I understand you were not a member of the community or weren't living in Hutto at the time that this landfill was initially permitted. Is that correct?
A That's correct.
Q So you wouldn't have had an opportunity to even get involved back then. Is that correct?
A I had no knowledge of anything that existed as far as a landfill in a lot of the areas and anything in Hutto, actually, at that time; so that's correct.
Q And so this is -- this appears to be the first time that you have had the opportunity to provide some public input into how this landfill should be expanding. Is that correct?
A That would be correct.
Q And you mentioned a concern for the safety of your students. Is that part of the reason that you decided to provide testimony and get involved in this hearing?
MR. DIETZ: Seems to be bolstering the prior prefiled direct testimony. That's directly out

Page 995

of that direct testimony; so I object to this.
JUDGE CARD: Overruled.
A Yes. Priority is number one safety of our students in our school district.
Q And during your cross-examination, many of the questions appeared to focus on specific concerns that were in one small part of your prefiled testimony. Is that fair to say?
A It seemed to. Yes, ma'am.
Q The motivation for your involvement in this proceeding, is it limited to those specific factors that were discussed in your cross-examination?
A It's not limited to, no, ma'am.
Q And, in fact, as part of your prefiled testimony, you included a demographic analysis. Isn't that true?
A I did.
Q Do you think that growth patterns or the demographics of the area is an important consideration to discuss as part of this landfill expansion?
A I believe it is. Yes.
Q And is -- the growth of the community in the direction of the landfill, is that one of the concerns that you have with regard to the proposed landfill expansion?

Page 996

A It is.
Q And whether current growth patterns are at all compatible with the expansion as it's currently proposed?
A Those are our concerns. Yes.
Q And the growth patterns that are reflected in the demographic analysis, was that a -- how big of a factor was that in deciding to purchase the land where you did?
A Certainly the top priority in regards to looking for land was the growth of our school district and where that growth is located.
Q And do you think that -- the information in the demographics analysis, do you think that that information should be or needs to be limited to guiding an entity like the school district in purchasing only schools? In other words, could you use that information for other sorts of government construction or expansion?
MR. DIETZ: It's now moved out of any expertise. This witness has testified -- he's testified that he has no landfill -- land use expertise, and so I think that she's now attempting to elicit an expert opinion for which he has not been qualified, and, in fact, has said he is not qualified.

Page 997

MS. PERALES: I'm merely asking if the demographic analysis, if he would limit it only to the purchase of school properties as far -- I mean, if he knows and in his experience. I think he can answer that question.
MR. DIETZ: Again, I renew my objection, and on top of that, it calls for him to speculate as to what other governmental entities may or may not require.
JUDGE CARD: We're going to sustain the objection.
MS. PERALES: Okay.
Q (By Ms. Perales) In your experience as a superintendent, does the demographics analysis guide you only in your decisions regarding where to place a school -- a particular school?
A That is not the only ways that that is helpful. No.
Q And, in fact, was the demographics analysis prepared for that sole purpose?
A No. It was not for that sole purpose.
Q What was the purpose of the -- what is the purpose of the demographics analysis?
A Basically, it provides us a huge variety of information, certainly what the projected growth of

Page 998

our district is, where the projected growth of our district will be. It gives us informations in regard to where development and future development in the district would look like in regards to neighborhoods and subdivisions. It gives us some long-range information for planning; not just for the immediate future but for the next five to ten years. It gives us the breakdown of ethnic groups. It gives us the breakdown of -- it provides patterns of where growth is currently, where growth will be. It provides us a breakdown of young families, the medium age versus the elderly families, which gives us information, again, as to future projection.
Probably a lot of other things, but those are a handful of things that we really study.
Q And there was -- excuse me. There was some discussion as to why you provided the City of Hutto's Growth Guidance Plan. Was that guidance plan requested of you by the Hutto Citizens Group?
A I believe it was. It was requested through the process of this trial.
Q And presumably that's because the Hutto Citizens Group hadn't obtained it from the county or the Applicant in this matter. Is that correct?
A Yes. They -- they -- no one knew it existed,

Page 999

apparently, and we happened to have a copy of it.
Q So the Hutto Citizens Group basically relied on -- or turned to you to get information about demographics, growth guidance information and land use information in general. Is that correct?
A I -- yes.
Q The county did not. Is that correct?
A I had no contact with the county.
MS. PERALES: Thank you, Dr. Borrer. I'll pass the witness.
JUDGE CARD: Dr. Evans.
MR. EVANS: May I, please?
RECROSS-EXAMINATION
BY MR. EVANS:
Q Mr. Borrer, we're kind of at the far end, and like Mr. Cravens, I do have a problem; so I'd like to ask you to see if I understood some things.
Did I hear -- oh, yes, and I have an absent mind, too, I guess. Sorry.
Did I hear Mr. Dietz cite the prefiled testimony of an expert identified as Dr. Evans?
(Laughter)
A I believe -- I believe so, but --
Q (By Mr. Evans) Do you know who he was speaking of?

Page 1000

A I know you're Dr. Evans.
Q Okay. Well, perhaps I'm the same one. I don't know. He did not use my proper name.
Mr. Dietz repeatedly suggested that the present -- that the life expectancy of the present permit, which is generally, among many of the people here, known as MSW 1405A, to be 25 to 50 years. You -- I did not see any objection on your part that you found that those numbers were excessive or improper.
A I'm not sure that I'm -- that I have enough knowledge about landfill life expectancy to really make a judgment on whether those are improper or not.
Q Have you seen any documents estimating the landfill -- I'm sorry -- the life expectancy of the current landfill, MSW 1405A?
A I'm sure I've got documents that I have seen that probably discuss that. I'm not sure that I can recall, necessarily, what all those were saying.
Q Have you read in the application that the expected life expectancy -- I'm sorry. Have you read in the application for MSW 1405B that the predicted life expectancy is 49 years after expansion?
A I have not read that, but I -- I expect --
Q Does that --

Page 1001

A -- it's there.
Q I'm sorry. Excuse me.
A I was going to say I would expect that if you're quoting that, that that's probably there.
Q Would that arithmetic, even without your graduate degrees, give you a mathematic problem?
A Well, I think I've heard those called "fuzzy math" in the past.
Q I call them a conundrum.
Are you aware of any restrictions in the source of waste from -- any restrictions in this permit, 1405A, or the requested permit, 1405B, that restricts waste from any place in Central Texas?
A I'm not aware of that. No, sir.
Q From any place in the state of Texas?
A I'm not aware of that. No, sir.
Q From any state in the United States?
A I'm not aware of it.
Q From Mexico?
A No, sir.
Q Are you aware of any restriction in the contract between Waste Management and the county -- 2003 existing contract that restricts waste from anywhere in Central Texas?
A I'm not aware of any restrictions. No, sir.

Page 1002

Q Anywhere in the state?
A No, sir.
Q Anywhere in the nation?
A No, sir.
Q Mexico?
A No, sir.
Q Have you taken a look at the draft of the proposed contract between Williamson County and Waste Management?
A I've seen the draft. I have not studied it, but I'm aware of it.
Q Are you aware of any limitations in that contract for --
A Not that --
Q -- waste limited from the CAPCOG area?
A None that I'm aware of. No, sir.
Q So would it be appropriate to conclude that waste brought into Williamson County is not determined solely by the growth in Williamson County?
A I could conclude that. Yes sir.
MR. EVANS: Thank you. I pass the witness.
JUDGE CARD: Ms. Fox.
MR. FOX: Pass the witness.
JUDGE CARD: Mr. Dunbar.

Page 1003

MR. DUNBAR: No questions.
JUDGE CARD: Mr. Ekoh.
MR. EKOH: Judge, I have just a few questions.

RECROSS-EXAMINATION

BY MR. EKOH:

Q Mr. Borrer, you testified that this would be the first opportunity you have to provide input as far as the expansion application is concerned.

A In a public situation, yes, sir.

Q Were you aware that there were public meetings held with respect to the expansion application?

A I'm aware of a few of the public meetings. Yes, sir.

Q Did you attend any of the public meetings?

A The ones I was aware of I had conflicts either with board meetings of my own or of other ones; so, no, sir, I did not. But we did have representatives there from the district. My assistant superintendent attended, I believe, one or two, and then we had principals, I believe, that attended some.

Q Do you know if any of the board members attended any of the public meetings?

A I'm not aware that that took place. That

Page 1004

could have, but I'm not aware of that.

Q And, in fact, one of the public meetings was conducted at one of your facilities. Right?

A Yes.

Q And the second one was conducted at the -- one of your high schools. Is that correct?

A Well, we've only got one. So if it was conducted at our high school, it would have been conducted there.

Q Now, did anyone at some point represent to you, for instance, that the Executive Director had issued a draft permit approving the expansion in this case?

A I'm sorry. One more time.

Q Are you aware that a draft permit has been issued with respect to the expansion application in this case?

A I'm not aware of a draft permit. No, sir.

Q Prior to your making of -- prior to the school district making the decision to purchase the land -- and I'm going to quote you here, "within one mile of the expansion application," prior to that decision being made, did you or anyone in the school board, did you have any representation from anyone that the expansion would not be approved if you

Page 1005

opposed it?

A Would -- I was -- when you say "representation," was there someone available is what you're asking?

Q Did anyone tell you or do you know of anyone ever representing to you that if you opposed the expansion, that the Executive Director would not approve it?

A I suppose not. I'm not really sure I understand the nature of the question, but --

Q Now, did anyone ever represent to you that the landfill would not be expanded in the future?

A I don't recall anyone making that representation to me.

MR. EKOH: I'll pass the witness, Judge.
JUDGE CARD: Mr. Dietz.

RECROSS-EXAMINATION

BY MR. DIETZ:

Q Following on Mr. Ekoh's questions, there were three public hearings on the landfill. Are you aware of anyone from Hutto Independent School District commenting at those public hearings in opposition to the landfill expansion?

A I am not aware of anyone making comments of that. No, sir.

Page 1006

Q The landfill application came first before the acquisition of property by the Hutto Independent School District. Is that true?

A I would say yes.

MR. DUNBAR: Excuse me, Mr. Dietz. Can you speak in the microphone a little better?

Q (By Mr. Dietz) The landfill --

MR. DIETZ: I'll repeat for your benefit.

Q (By Mr. Dietz) The landfill application came first before the acquisition of property for the Hutto Independent School District.

A Yes.

Q You have complained that no one from the county came to the Hutto Independent School District. Did anyone from the Hutto Independent School District ever go to the county, go to a Commissioners' Court meeting and explain their position?

A To my knowledge, no, but I can't speak that that did not take place.

MR. DIETZ: No further questions.
JUDGE CARD: Mr. Humphrey.
MR. HUMPHREY: None.
JUDGE CARD: Ms. Perales, anything based on Mr. Dietz's cross?

FURTHER REDIRECT EXAMINATION
BY MS. PERALES:
Q By your testimony at this hearing, are you now expressing your concerns to the county for the school district?
A I am. Yes.
MS. PERALES: Thank you.
JUDGE CARD: Anything else based on that one question?
(No response)
JUDGE CARD: Thank you, Dr. Borrer. We appreciate it.
A Thank you.
JUDGE CARD: Let's take ten minutes and we'll resume with Mr. Cravens.
(Recess: 2:39 p.m. to 2:56 p.m.)
JUDGE CARD: We're back on the record. And I believe, Mr. Dunbar, you were cross-examining Mr. Cravens.
Thank you for waiting.
A You're very welcome.
JUDGE CARD: Appreciate it.

PRESENTATION ON BEHALF OF THE APPLICANT (CONTINUED)
PAUL B. CRAVENS,
having been previously duly sworn, testified as follows:
CROSS-EXAMINATION (CONTINUED)
BY MR. DUNBAR:
Q Mr. Cravens, prior to the break, we had -- you and I had worked on putting together a drawing, I believe, that's been labeled TJFA-18.
A Yes.
Q Okay. And we were generally describing the various possible slow failures that could occur as a result of the construction and operation of a landfill. Correct?
A That's correct.
Q Okay. And hopefully you and I did a good enough job to prepare that drawing that people can, maybe, understand it at the end of this hearing.
Right before we stopped, you had used a phrase, "factor of safety." Do you remember that?
A That's correct.
Q Okay. And I just wanted to kind of talk briefly about that so we all understand what that means. If you would, turn to Page 1638 of Attachment 6C.

A I'm there.
Q And the third paragraph there on that page right before Table 1 -- and this -- the sentence says: "The design criteria for the slope stability analyses are measured by the factor of safety." Correct?
A Correct.
Q Okay. Could you explain to us briefly what a factor of safety is?
A Certainly. The potential failure surfaces that you see on that drawing represent the interface behind driving forces, which is, for the most part, the weight of the soil above that surface that we've drawn, and resisting forces, which are the inherent strengths of the soils. And I'm really oversimplifying, but just to get us past this. And so factor of safety is a measure of the resisting forces compared to the driving forces -- or vice versa, actually.
Q And so what is the reason to have a factor of safety?
A The purpose for a factor of safety is to -- it's to give you a threshold to evaluate a cross-section, and it's a -- it's a decision threshold. You would -- so the purpose of it really is to give you a threshold by which you can evaluate a

slope stability problem and make a decision as to whether you wish to investigate it further, flatten the slope -- make a decision about it -- or whether it's fine the way it is.
Q Okay. And so when you perform a slope stability analysis, with all of the parameters you put into that analysis, one of the numbers that comes out of it is a factor of safety.
A That's correct.
Q Okay. And if you do your analysis and you get a factor of safety of less than one, what does that imply?
A Generally, that implies that you would not want to -- you'd either want to get more information and continue your analysis or you'd make a decision that that's not a slope that you'd want to build and you'd want to flatten it or do some sort of engineering corrective action.
(Interruption)
A That's probably me. I'm sorry.
Q (By Mr. Dunbar) Isn't it true, Mr. Kerry -- excuse me. Isn't it true, Mr. Cravens, that if you calculate a factor of safety less than one, that, therefore, if all of your assumptions were correct in the analysis, that would indicate that, in fact, you

Page 1011

would get a slope failure if you built it exactly the way you designed it?
A No.
Q No. Okay. Why not?
A The -- you can have slopes that, because of the conservative assumptions that you make going into the analysis, will stand for years at a slope that has a factor of safety less than one, and you still may choose not to build it or you may choose to make more of a study.
I didn't say that very well.
Q Yeah. Let me ask the question again because it, obviously, wasn't a good question.
A Okay.
Q What does a factor of safety of 1.0 mean when you do your calculation?
A Factor of safety of 1.0 means that for the data that you input into the system that -- it would indicate that the resisting forces are equal to the driving forces, and, therefore, adding any more driving forces would, in the model -- maybe not real life, but in the model would cause a slope failure.
Q Okay. And that's what I was trying to get at, and, obviously, I did a good job of asking the question.

Page 1012

So if you -- if the forces that are acting upon the various components of -- let's say, your liner, for example. If the forces that are acting upon your liner are greater than the forces that are preventing your liner from moving, then you'd expect a liner to move and shift.
A In -- correct.
Q Okay.
A In real life.
Q And if you do your calculations of the forces against the liner and what those shear strengths are and they are greater than the forces associated with keeping the liner there, you'd get a factor of safety of less than one.
A In the model, that's correct.
Q Yes, in the model.
A Correct.
Q Okay. And that would indicate, at least based on the model, that you would have a slope failure.
A That's correct.
Q Okay. Conversely, if you -- if the forces acting upon your liner are less than the force keeping the liner there, you would calculate a factor of safety of greater than one.

Page 1013

A That's correct.
Q And you would, therefore, anticipate and expect, at least based upon the model, that you would not have a slope failure.
A That's correct.
Q Okay. So your slope stability analyses is essentially a mathematical model or calculation on what you would anticipate to be the likelihood of a slope failure or not the likelihood of a slope failure.
A I'm sorry. The -- the drilling distracted me. Would you ask that again?
Q I will ask that again.
In other words, we are doing a -- we are using, essentially, a mathematical model or calculations to determine this factor of safety.
A That's correct.
Q And it is based upon various assumptions that go into that model or calculation.
A It's -- it's data that goes in there, combined with engineering judgment.
Q Okay. And are you more comfortable in referring to this as a model versus the word "calculations"?
A The "model" is more accurate since it has to

Page 1014

do with space as well as mathematical concepts.
Q Okay. So I will refer to "model" and you'll understand and hopefully we all will understand that that's referring to a -- maybe a series of calculations that are essentially trying to calculate the factor of safety.
A That's correct.
Q Okay. All right. So like any model, garbage in, garbage out. Would you agree with that?
A That's correct.
Q All right. So do you agree, therefore, that it is important that the input into the model be as accurate as you can get?
A Well, there's a point of diminishing returns, but you want it to be accurate so that you have a good degree of certainty.
Q Okay. Because -- well, at least would you agree with me that the more accurate information you put in the model, the more confident you would be in the result that you'd get?
A Up to a point, yes.
Q Okay. And, likewise, the less accurate or less certain you are about the assumptions you put in the model, then the less accurate or less certain you are about the result the model gives you.

Page 1015

A Generally speaking, yes.
Q Okay. And would you agree with me that in this model calculation, that not only is the uncertainty of the input an important consideration, but also the risk of what a -- of the subsequent effects of a slope failure might produce be a consideration in determining what an acceptable factor of safety would be?
A That's -- the effect of a slope failure does impact which factor of safety threshold you would choose.
Q Okay.
A Yeah.
Q And maybe to make it simpler, I'm going to bring it up in two parts.
A Thank you.
Q The factor of safety you would select that's one that you would be comfortable with is dependent, in part, on the uncertainty of -- that you have or the lack of confidence you have in the input parameters you're putting in.
A That is less so than the parameters that you choose. So the factor of safety generally -- it can be adjusted for uncertainty in data, but for the most part, it's related to whether it's a long-term slope

Page 1016

or a short-term slope, whether it's -- there's a foundation or a building involved with it or if it's a landfill where you -- it's not a big of an impact; it's not a health hazard, for example.
So that's -- that goes more into the selection of the factor of safety than the data input. The data input, separately, you would look at that and make decisions about what the input data would be for the most part separately from the factor of safety threshold you would pick.
Q Okay. But those are two things you would consider in ultimately deciding whether the factor of safety you end up with from your model is one you would accept as an engineer?
A Yes.
Q Okay. And did I understand you correctly in your answer previously that -- when you talked about a failure of a landfill, did I understand you that you didn't think that was -- would cause any concern to the environment or anything?
A I did not say that.
Q Okay. I misunderstood.
A Okay.
Q Do you believe that a failure of a landfill poses a significant risk to the environment?

Page 1017

A Failure of a municipal solid waste landfill?
Q Yes.
A I don't think it would be a significant risk. No.
Q Okay. You don't think a failure of a municipal solid waste landfill would pose a significant risk to the surrounding environment, if it were to happen?
A If it were left unattended, if it weren't healed, if it weren't fixed or repaired, then, yes, but if it fails and it's observed and repaired, then there's a very short period of time where the trash would be exposed to the environment.
Q Even if we have one of these big failures we've talked about and showed on TJFA Exhibit No. 18 where the whole final buildout, the whole landfill slides and pushes off to the side onto natural ground?
A That would not be the whole landfill sliding. This would be a discrete portion of the landfill sliding, and it would expose the garbage. It would damage the liner, and it's all repairable. I'm not saying it's not a -- that it's a bad thing. It's not something we want to happen, but I don't understand the impact -- long-term impact to the environment if it were addressed quickly.

Page 1018

Q Okay. What about the short-term impact to the environment if that failure -- this waste and this whole landfill slide being pushed out in an act of -- to the natural ground there and that natural ground, let's say, happens to be a creek --
A Uh-huh.
Q -- and there's water in it and trash starts floating down the creek?
A That would be a -- I mean, it always depends on what's in the material that's going into the creek, but it wouldn't be something you'd want -- I don't -- I haven't studied the environmental impacts of municipal solid waste going into a creek.
Q Okay. But, clearly, it's not something you would think you'd want to have happen. Correct?
A No. Of course not.
Q Okay. So -- and in the factors of safety that you have reviewed in this application for the various slope stability analyses, what's the highest factor of safety that you've seen calculated?
A For which analysis?
Q Any analysis.
A Any analysis?
Q Yes, sir.
A I'd want to review the documents really

Page 1019

quickly.
Q Please. Go ahead.
(Brief Pause)
A 20.7.
Q (By Mr. Dunbar) I'm sorry. 20.7?
A 20.7.
Q Okay. I'm going to do some more drawing here and create a drawing that's associated with factors of safety according -- associated with this permit application and the slope stability analyses, and I believe your testimony was the maximum number that was calculated was 20.7.
A That's correct.
Q Okay. And I'm including on this drawing as well a factor of safety of one as kind of being the threshold above which we would expect, based upon the model results, no slope failure and below which we would expect, based on the model, a slope failure.
A That's correct.
Q Okay. What's the -- do you have any factors of safety that you've calculated that have been over 10?
A Yes. There's 14.8.
Q Okay.
A That's the only other one.

Page 1020

Q Okay. And with a factor of safety of 20.7, as a geotechnical engineer, are you pretty comfortable in concluding from that that there is a small risk of slope failure based upon the analysis that you did or that was done that gave you a 20.7 factor of safety?
A It would be a -- it's an indication -- I'm hesitating because it's -- can you hear me?
(No verbal response)
A Okay. I thought it went off.
I'm hesitating because it's not as scalable as we may think. So a 20.7 isn't necessarily twice as good as a 10.35. It really just means that it's incredibly stable. And so I want to be clear that when I say, "yes," that it's -- it's way out there.
Q Okay.
A Yeah.
Q The conclusion that you would reach, then, is it's incredibly stable.
A Right. That's assuming all the input was correct, all that good stuff.
Q Okay. And if the input was not correct, that factor of safety of 20.7 could be higher or lower.
A Correct.
Q Okay. And what about a factor of safety of

Page 1021

14.8, would you have the same conclusion that it was -- what was your word again, "incredibly" --
A Very stable.
Q Very stable. Okay.
And in the design of a landfill, given the potential risk of the environment, whatever it may be, what is an appropriate or the minimum factor of safety we should be -- or that was used in this application for the slope -- any slope stability analysis?
A We actually -- it changed based on the analysis. Because for short-term period, you can have a lower factor of safety -- during construction, for example -- so the threshold -- the target factor of safety, if you will, was 1.3.
Q Okay. And I can refer to that as the minimum?
A Sure.
Q Okay. And that 1.3 was associated with -- did you say short-term?
A So that was associated with the construction -- leading construction face, the open soil. The sidewall.
(Brief Pause)
A There we go.

Page 1022

Q (By Mr. Dunbar) It was associated with the --
A "Excavation cut" is how it's labeled there.
Q Okay. Excavation cut. All right.
A That's correct.
Q All right. What about the factor of safety associated with the waste with daily cover at four to one slope?
A We didn't do a slope stability analysis on that. We considered that stable through inspection through the knowledge of the -- how shallow the slope was.
JUDGE CARD: If you would, speak up a little bit more. I'm having a little trouble.
A Yeah. I'm having trouble, too.
I'll try.
Q (By Mr. Dunbar) Okay. Can you repeat your answer?
A Sure. For the working face of the trash, a four to one slope is very, very flat. It's inherently stable. We didn't do a slope stability analysis on it because you could tell through the characteristics of the material that it's not going to fail in a four to one or a three to one or anything close to it.
Q Okay. Well -- but the final cover is also at

Page 1023

four to one; so I guess I'm having a little confusion understanding why the leading waste face at four to one you didn't have any problems, needed a slope stability analysis, but the final cover four to one you did.

A On the waste, it's a work in progress while you're stacking it up; so it keeps changing where it is. It's also in a controlled environment; it's also under construction. And so it doesn't have the same impact -- if there's a sloughing of the waste, there's no impact. There's no damage to a liner. There's no damage to -- there's no chance of trash moving into a creek, as you mentioned. None of that is going to happen.

Q Okay. But these kind of failures that we were showing here in 1 or 2 or 3, couldn't they occur as this working face of the entire landfill works its way towards filling up the whole landfill?

A I guess I'm not following.

Q Okay. Let me try again. Are you -- we talked about when you had a final cover. Correct?

A Oh. I understand now.

Q And when we had the final cover, I think you talked about there were three different types of slope failures that could occur.

Page 1024

A Correct.

Q Okay. And when you -- when we were talking about the final cover, was your understanding of that being that the entire landfill was total complete buildout, it was over with and no more waste was going to be put in the landfill?

A Correct.

Q Okay. Prior to that final point, throughout the development of the landfill and operation of the landfill, is there periods of time when the landfill would have a final cover on a portion of it?

A My understanding is is the final cover is constructed along the leading edge, but I'm not the designer. I don't remember exactly how that works.

Q Okay. Assume with me, then, that through the course of development of the landfill and the filling up of the hole with waste, that as the -- that operation moves from the west to the east, that during the course of that operation, final cover is being put on portions of the landfill that have reached the final height. Does that make sense?

A Yes.

Q Okay. And you understand what I'm talking about here?

A Yes.

Page 1025

Q Okay. In that kind of situation, could you not have the potential for a foundation failure, a liner failure or a waste failure?

A Yes.

Q Okay. And did you look at or was there a slope stability analysis done for that kind of situation?

A The analysis that we're looking at right there with the final cover and the waste in it?

Q Yes.

A What you're describing approaches that, and, therefore, this analysis can apply to that. In other words, what I think you're saying is "Can't you have a similar failure to this not at the very, very end when everything is tucked away but as we're constructing it at the very end?"

Q That is what I'm asking.

A All right. And the --

Q Thank you.

A And the answer to that is that this analysis that we're doing here used very conservative assumptions -- I'm sorry -- the analysis for the foundation failure, liner failure, waste failure for the final cap surface, it was a long-term analysis, meaning that, you know, what's the worst case -- it's

Page 1026

a worst-case analysis.

And so what you just described, you know, would be a short-term situation where the waste would be close to the excavation cut and the cap is being placed on it, for example, and so it would be more stable than the model that we're describing here.

Q Okay. So the analysis that you did or that was done for the foundation liner and waste slope stability analyses was a worst-case condition. Correct?

A Well, it was a -- "worst case" takes in too much. It was a long-term stability with very conservative assumptions for the soil strength, for example. So long-term.

Q Okay. So I can write "long-term" on this exhibit and --

A Yes.

Q -- be -- it's appropriate to put there?

A I think that's better than "worst case."

Q Would you like me to cross out "worst case"?

A Please do.

Q All right. So it was a long-term -- based on long-term -- what do you mean "long-term," 5 years, 10 years, 50 years, 100 years, 1,000 years?

A Probably thinking in terms of -- for the

Page 1027

stability of this, probably 10 years.
Q Okay. And then you said something else besides long-term.
A It also included very conservative assumptions about -- not assumptions, values for the soil strength and subgrade strength.
Q Can I write down "very conservative assumptions"?
A Sure.
Q Okay. And do you know why very conservative assumptions were used in this slope stability analysis we've been talking about here?
A Well, I didn't perform the calculations; I reviewed them. So that's how I know they're conservative. They could have been higher strength values, for example, used to represent the soils that are out there.
So I don't know what was in his mind, but I do know that this is inherently such a stable system with very, very flat slopes for the cap, very stable subgrades, that it would make sense that you would want to push the envelope. So there's no reason not to use very conservative models, use a conservative assumption, go with long-term. It will give you the worst possible factor of safety you can

Page 1028

derive. So I don't know if that was his thought, but that's why I accepted it. I thought it was a reasonable thing to do.
Q Okay. And based upon your review of that analysis, you believe it was based on a long-term situation of about 10 years and that you believe it was using very conservative assumptions and that you believe that -- what was the last thing you just said?
A I can't remember.
Q I can't either.
(Laughter)
Q (By Mr. Dunbar) That you believe that you could -- well --
A Oh. It's inherently a very stable system, just by looking at it.
Q Can I write "inherently very stable"?
A Yeah.
Q Okay. And this slope stability analysis we're talking about here on TJFA Exhibit 18 on the right-hand side, is that labeled as, like, the final buildout condition? Is that what we're talking about?
A Yes, it is.
Q Okay. So do you mind if I put "final buildout condition" on top of 1, 2 and 3?
A Not at all.

Page 1029

Q Okay.
JUDGE VICKERY: Mr. Dunbar, can I break in and clarify something for us real quick?
CLARIFYING EXAMINATION
BY JUDGE VICKERY:
Q The long-term ten-year period, what does that refer to? What is that bridging?
A It is when you complete the construction of the cap and all of the soils get to kind of rest. And, over time, you can have lower shear strengths in the soil, and so rather than use really high values and high shear strengths for the soil, you want to use lower values so it gives a chance for the soil to release some of the water that's in it, because of the pressure that's on it now, and that lowers its shear strength. And so it's very unlikely that immediately after construction you would have one of these slope failures. It's unlikely it would happen here anyway, but if it were going to happen, it's more likely it would be in the future after the soil had had a chance to rest, lose some of the water, get squished out, and it loses some of its inherent strength that way.
Q So that this analysis is ten years in? It's based on -- it's covering a ten-year period or it's --
A No. It's --

Page 1030

Q -- ten years into the close of --
A And it's approximate. It's five, ten years, but it's out into the future is when the -- if a failure were to occur, the lowest strengths would occur after the water had time to leave, four or five, six, seven, eight years from now. Something like that.
CROSS-EXAMINATION (CONTINUED)
BY MR. DUNBAR:
Q So it would be more accurate in your testimony to put five to ten years?
A Sure. There's a lot of discussion about how long it takes, but five to ten years is more accurate.
Q All right. And I will write here "5 dash 10 years."
A Okay.
Q All right. And is it -- and you were talking to, in a question from the Judge, about moisture leaving the soil. Do you --
A Right.
Q -- recall that?
A Right.
Q What soil are you talking about?
A The foundation soils.
Q Okay. The foundation soils down here below

Page 1031

the bottom of the landfill?
A That's correct.
Q Okay. And that they, over time, become less strong because of the squeezing out of any moisture in that?
A Right. When they're first loaded, the water is taking up some of the load. Because it's such an impermeable clay, it takes a long time for the water to move out and for the soil particles to take up the rest of that load.
Q Okay. But besides the soil, you could have a slope failure associated with the contact between the liner and the soil. Correct?
A That's correct.
Q And the liner wouldn't have to have any time to have moisture be pushed out of it, would it?
A That's correct.
Q Okay. So a failure that would be associated with the liner could take place one year into the operation rather than five to ten?
A Correct.
Q Okay. And so this five to ten years is really associated with a failure that would be related to a failure involving the soil.
A The foundation. Right.

Page 1032

Q Excuse me. Foundation.
A Right. That makes this model very conservative when you're analyzing the liner and the waste, by the way, meaning that it gives you a lower factor of safety than if you had done a short-term analysis. All the numbers passed; so, you know, we just went on.
Q Okay. And -- boy, I didn't understand that one.
A Okay.
(Laughter)
A It's actually not important.
Q (By Mr. Dunbar) It's not important?
A It's not important for these purposes.
Q Okay. Good.
(Laughter)
A I'm just being an engineer. Sorry.
(Laughter)
Q (By Mr. Dunbar) I am, too, and I understand. When we talk about -- so this 1.3 minimum factor of safety we talked about earlier, you said it was associated with the short-term analyses.
A That's correct.
Q Okay. So can I put "short-term" under 1.3?
A Yes.

Page 1033

Q Okay. And with regards to the long-term analyses that were done, what was the minimum acceptable factor of safety in your mind?
A 1.5.
Q Okay. Can I label that "long-term"?
A Or "buildout," whichever you prefer.
Q Okay. Let's put "long-term."
Did any slope stability analysis that was run, besides final buildout, have the assumption that it was long-term?
A Not that I can think of. No.
Q Okay. So all of the analyses -- slope stability analyses were based on the assumption that they were considered short-term except for the final buildout?
A I believe so, but let me double-check.
Q Okay.
(Brief Pause)
A That's correct.
Q (By Mr. Dunbar) Okay. And so that's why you said I could put "final buildout"?
A Right.
Q And I will.
Now, do you know if there's any publications, references, literature research

Page 1034

information that can tell someone like yourself, a geotechnical engineer, what is the acceptable minimum factors of safety that one should use for the design or construction of a landfill?
A I had an answer already. There's -- short answer is: Yes.
Q Okay.
A There's journal papers; there's textbooks. I was about to say, the Army Corps of Engineer has a manual, but that's not focused simply on landfills, though -- wait a minute. In their discussion, they talk in terms of being able to use a lower factor of safety for engineering objects -- or projects that are not a direct health and safety impact to individuals. And I'm talking about physical safety.
Q Okay. And would you consider this situation of this proposed landfill as a situation that does not pose any risk or danger to people's health, safety or the environment?
A I think that a -- in the very unlikely instance that a slope would fail here, I don't think it would be a safety hazard. It would not push cars over and things like that. It's a contained -- well, I'm not going to go there. It's simply not that kind of a failure. It's not like a mud flow kind of

Page 1035

failure. It's just a rotation of soil.
Q Okay.
A For the environment, we've already discussed that.
Q Right. Okay.
Have you heard about any landfill failures that have occurred in the United States?
A Yes, I have.
Q Which ones have you heard about?
A Well, I don't remember them all. They get written up a lot.
Q Okay. Any that you remember?
A The Kellerman Hills, I think, is one that comes to mind.
Q Could you spell that?
A No.
Q Okay.
(Laughter)
Q (By Mr. Dunbar) Say it slowly.
A Kellerman, I believe is how -- I think it's K-e-l-l-e-r-m-a-n. I think.
Q All right. And that was a landfill failure?
A That's correct.
Q And was it based on a slope failure?
A It was a -- yes, it basically was a slope

Page 1036

failure.
Q Okay. And do you know what part of the country that was in?
A I believe it was in California.
Q Okay. And do you know approximately what year or decade or whenever that happened?
A I don't remember.
Q Okay. Was it in the last 20 years?
A Probably in the last 20 to 30.
Q Okay. All right. And do you know why that particular landfill slope failure occurred?
A As I recall, it had a very soft foundation, had a very soft clay foundation. There were other -- they were, basically -- if I remember correctly, they were actually filling in like a ravine, and the clay underneath it was very soft, didn't have very much strength, and that's what gave way.
Q Okay. But when somebody was designing that landfill, didn't they take into account the soft clay that was underneath the landfill?
A I don't know the history of the design.
Q Oh, okay. As a geotechnical engineer, would you have hoped they would have taken into account the soil conditions underneath the site?
A Yes.

Page 1037

Q Okay. And so it's possible that maybe they didn't or they made a mistake in their design calculations?
A I just -- I have no idea.
Q All right.
A And, actually, I'm not even sure of the age, to be quite honest. It may have been a very old landfill.
Q Okay. Any other landfill failures that you're aware of that occurred in the United States?
A I read about them, but I don't recall them right now.
Q Okay. Of the ones that you read about but don't recall their names, do you know why any of those landfill failures occurred?
A I don't recall. I'd have to review the literature.
Q Okay. Do you know if any of them occurred as a result of slope failure, or is that what we're talking about when we say "landfill failure"?
A No. It may have actually been a sloughing failure instead of an actual rotating failure.
Q Okay. And explain to us what a sloughing failure is versus the rotating failure.
A For example, instead of that entire mass

Page 1038

rotating out, it may have been just a surface flow. I'll call it a "flow" just for purposes of the testimony. So it would be a very steep slope, and so it would cause part of it to delaminate, I guess is a good way of putting it.
JUDGE CARD: What? I'm sorry.
A Delaminate.
Q (By Mr. Dunbar) Okay. So instead of kind of this rotational failure we were talking about before that we showed along, I guess, Line 3 or 1, it was more of a -- just a failure of one particular slope just sliding down the slope?
A That's correct.
Q Okay. And whether it was on the final cover or on the working face of the landfill or maybe just the slope of an excavation?
A Correct.
Q Okay. Now, when you do the final buildout slope stability analysis, I believe your testimony was that there were very conservative assumptions made in that.
A That's correct.
Q Okay. And because of those very conservative assumptions that were made, what was the factor of safety that was calculated for the final buildout?

Page 1039

A You have three factors of safety at four locations.
Q Okay. And that's -- so it's a total of 12 combinations.
A That's correct.
Q Okay. And what page are you looking at, to help all of us?
A This is APP-202, Page 1640.
Q 1640?
A One six four zero.
Q Okay. And that is Table 1?
A Table 2.
Q Okay. And that shows the factors of safety that were calculated for the final buildout that produced the -- those numbers in that table based upon a long-term analysis. Correct?
A Correct.
Q And based upon very conservative assumptions. Correct?
A Correct.
Q That produced, in your opinion, an inherently very stable final buildout condition?
A I don't know if it produced it, but we started with the inherently very stable buildout condition just because of the nature of the slope.

Page 1040

Q Okay. All right. And the factors of safety that you see on Table 2, what's the maximum factor of safety that was calculated?
A 3.119. 3.1 -- I'm sorry. 3.2. I missed one.
Q 3.2. And this is going to be from Table 2 -- right -- for final buildout?
A Correct.
Q Okay. And what was the minimum factor of safety?
A 1.8.
Q Okay. It's getting kind of close to your minimum 1.5, isn't it?
A It is an acceptable number.
Q It's an acceptable number?
A Correct.
Q Okay. Because it's higher than 1.5?
A Correct.
Q Okay. So if you had gotten 1.51, that would have been an acceptable number?
A That's correct.
Q And if you had gotten 1.49, that would not have been an acceptable number?
A It would have caused us to look further.
Q Okay. And do you feel confident that the slope stability analyses that were done and contained in this application are that accurate so that if it's 1.51 you're comfortable?
A Yes.
Q That's your testimony?
A Yes, it is.
Q All right.
MR. RILEY: Judge, could we go off the record just for a second?
JUDGE CARD: Sure.
(Discussion off the record)
JUDGE CARD: Back on the record.
MR. DUNBAR: I was going to say, this is probably a good switching point to stop unless you want me to go about 10 more minutes -- or 15 more minutes.
JUDGE CARD: Yeah. Let's go ahead and -- we can go ahead and stop. If this is a good stopping point, we might as well go ahead and stop now rather than, you know, try to -- before we go all the way to the end, I guess.
MR. RILEY: Are we on the record?
JUDGE CARD: I think we're -- we're on. Right?
THE REPORTER: I'm writing.

Page 1041

Page 1042

JUDGE CARD: Well -- okay. Let's go off.
MR. DUNBAR: Well, if I can make a request on the record, Your Honor.
JUDGE CARD: Let's go on.
(Laughter)
MR. DUNBAR: Can I go ahead and label that drawing while we're right here and kind of get that as TJFA Exhibit No. 19 and offered into evidence?
JUDGE CARD: Try.
(Laughter)
JUDGE VICKERY: Along those lines, I wanted to ask -- we're off. Right?
JUDGE CARD: We're on, actually. He's labeling.
(TJFA Exhibit No. 19 marked)
JUDGE CARD: We are on the record and you have a request.
MR. DUNBAR: Yes, Your Honor. I'd like to offer TJFA Exhibit No. 19 into evidence.
JUDGE CARD: Any objection?
MR. MOORE: No objection.
JUDGE CARD: It's admitted.
(TJFA Exhibit No. 19 admitted)
JUDGE CARD: Do we need to -- can we go

off the record now?
(No verbal response)
JUDGE CARD: Let's go off the record.
(Discussion off the record)
JUDGE CARD: We're back on the record. We've discussed various issues regarding possibly putting Mr. Murray on the stand, if necessary, Attachment 10, and I think the parties -- without going into it all, I think the parties agreed that we can work these matters out pretty civilly. And I don't think there's anything else except to -- we will continue with Mr. Cravens again.
I appreciate you postponing your testimony.
We will begin with him on Monday and we will reconvene at nine o'clock.
(Hearing recessed at 3:50 p.m.)