BEFORE THE U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF ADMINISTRATIVE LAW JUDGES

In the Matter of:)
)
ENVIRONMENTAL PROTECTION) OPA-09-2018-00002
AGENCY,)
)
Complainant,) Administrative Law Judge
v.) Susan L. Biro
)
VSS INTERNATIONAL, INC.,)
)
Respondent.)

Phillip Burton Federal
Building and United States
Courthouse
Courtroom 15, 18th Floor
450 Golden Gate Ave
San Francisco California
Friday,
May 17, 2019

The parties met, pursuant to notice of the

Court, at 9:01 a.m.

BEFORE: HONORABLE SUSAN BIRO
Chief Administrative Law Judge
APPEARANCES:
For the Complainant:
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J. ANDREW HELMLINGER, Esquire
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(9:01 a.m.)

JUDGE BIRO: Good morning, everyone. Please be seated. Are there any preliminary matters before we continue?

MR. HELMLINGER: I think there's one, Your Honor. You had asked us to consider whether we could stipulate to admitting documents. I think we have that. So this will be a little duplicative of the list you had yesterday, and I apologize for that, but we're trying to keep it easy. There had been a stipulation before to the authenticity of documents, and we're just going to go ahead and stipulate to admit all of those documents.

JUDGE BIRO: Okay.

MR. HELMLINGER: So I can read this list to you. And I'm going to follow the same list with a slight amendment for the RX documents from that last stipulation that we sent you, but it would be CX 1 through 48 and 52 through 54 that could be deemed admitted into the record. And RX 1 through 24, 29, 32, 37 through 43 and 45 through 101, plus one that we deemed 104, which would be the declaration as well.

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(The documents referred to, previously marked for identification as Complainant's Exhibit Nos. 1 through 48, 52 through 54 and Respondent's Exhibit Nos. 1 through 24, 29, 32, 37 through 43, 45 through 101, and 104 and were received in evidence.)

JUDGE BIRO: Okay. We're all in agreement, we're going to admit those by agreement?

MR. HELMLINGER: By agreement, they're admitted --

JUDGE BIRO: Okay.

MR. HELMLINGER: -- if we have developments concerns or weight concerns, we'll argue that later.

JUDGE BIRO: Okay, right. That's a whole different issue. Okay. So by agreement, we're admitting all of those documents that Mr. Helmlinger just reiterated, Complainant's Exhibit 1 through 48, Complainant's Exhibit 52 through 54, Respondent's Exhibit 1 through 24, Respondent's Exhibits 29, 32, 37 to 43,45 through 101 and 104. Okay.

MR. HELMLINGER: Thank you.

JUDGE BIRO: Is there any other matter to proceed with preliminarily?

MR. HELMLINGER: I think we're ready to begin with the witness, if everyone else is.

JUDGE BIRO: Okay. Call your next witness, please.

MR. HELMLINGER: The Complainant calls Mr. Bill Michaud.

JUDGE BIRO: Madam Reporter, would you please swear the witness.

Whereupon,

WILLIAM MICHAUD

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

DIRECT EXAMINATION

BY MR. HELMLINGER:

Q Good morning, Mr. Michaud.

A Good morning.

Q Would you tell us where you are currently employed?

A I'm currently employed at CSRA, which is a company of General Dynamics Information Technology or GDIT.

Q And what's your position there?

A I'm a senior technical advisor within the

science and engineering division.

Q And how long have you had this position?

A I've been in this position for -- or with this company for 23 years, in different manifestations. We started with -- I started in a much smaller company that has been acquired and merged and et cetera to this point.

Q Could you describe your roles or responsibilities in this position?

A Sure. So I have a few different roles. I have administrative management roles where I manage a team of about 10 people. I have roles where I manage specific projects or task orders within contracts, and then on a more general element in my technical advisory role, I advise across many different projects with my colleagues. They'll bring me in to advise on technical matters on different projects.

Q Could you describe generally some of these projects?

A Yeah, so I work on probably dozens of projects. I can describe some of my current projects. For example, I'm working on some projects in the -- with the Great Lakes National Program Office, supporting that office of the EPA, dealing with screening level, ecological risk assessment,

developing clean up goals, remedial action levels for sediment projects, cleanup. Other projects, I've worked with communities, like a community down in Louisiana, I'm going to deal with flooding and flood mitigation issues. So that's just an example of some of my projects.

Q Could you describe your background, education a little bit, leading up to this position? What post-high school education do you have?

A I have a bachelor's in chemical engineering from Rensselaer Polytechnic Institute and a master's in public policy with a focus on economics and regulatory policy.

Q Do you have any certifications?

A I'm a professional engineer, licensed professional engineer.

Q In what state?

A In the Commonwealth of Massachusetts.

Q The Commonwealth, I'm sorry, not a state. Have you had any opportunities to participate in any peer studies, committee groups, other academics to broaden your professional experience?

A Sure, yes. I participate in professional societies. I was fairly active for a while in the American Evaluation Association. It's a very

researched-focused organization. I was appointed to the National Academy's Study Committee, evaluating some, streamlining regulations under the Department of Transportation, advising the Department on that -- those issues. And I've been -- I was appointed to an expert working group of the Organization for Economic Cooperation and Development on chemical safety performance indicators.

Q Could you describe any emphasis in your engineering education, whether it be mechanical, electrical?

A Sure, yeah. It's -- you know, as I said, I do have a degree in chemical engineering, and so I would say that I've practiced for the first eight or nine years of my career in a more traditional civil engineering capacity, dealing with hydraulics, hydrology, you know, design of hydrological systems or hydraulic systems and analysis, hydrology, strong currents (phonetic), things like that.

Since I got my graduate degree, I focused my -- I've been able to focus more on kind of the intersection of chemistry and chemical engineering and the environment in a technical capacity.

Q How does work come to you? You mentioned EPA as a client. How does work come to you from EPA?

A There are different mechanisms, typically, we'll have a contract with EPA. Some of those contracts -- we have many different contracts with EPA -- I might work on five or six at any one time, different contracts. Some of those contracts are very standard, thee are certain activities that are spelled out in the contract. For example, you know, a hazard ranking system, support for -- and listing sites from the national priorities list, that contract has some very set activities, Q&A review, response to comments, rule-making support, training, things like that.

Other contracts are much more open-ended, where EPA will come to us with a, you know, new task. I do a lot of work with the Office of Research and Development at EPA. And, and, and they'll come to us with some fairly technically challenging tasks that aren't set in stone, more open-ended types of projects. That's where I tend to do most of my work in this later part of my career, is in these more open-ended types of projects.

Q Could you describe whether any of these projects from EPA come to you with any sort of assumptions presented, either on law or technical material?

A I would say at least -- most of my projects

maybe, maybe half of my projects end in a type of research. The question will be couched in, in a broader regulatory context. So, for example, questions around cleanup levels or ecological risk or those types of questions obviously have a whole set of regulations that provide boundaries and context for any answer I would provide.

And in addition to regulations, you know, are obviously the statutes. You've got guidance and policy, and so, in order for me to answer questions that will come to me, I need to understand that broad context, absolutely.

Q Have you had, given your background in regulatory policy or engineering, opportunity or experiences where you have disagreed with any of the assumptions presented to you by EPA?

A Sure. And, you know, at times, those will be the technical assumptions and methods, regulatory implementation and how to interpret what the regulations say. And just as an example, last week, a client came to me or two weeks ago, I think now, and said, you know, we'd like you to establish cleanup goals based on petroleum hydrocarbons in sediment. And the client presented the methodology for doing that where, where, you know, certain risk-based

assumptions were made. And I looked at it, I didn't think that it really complied with a technically valid approach, given that it was a mixture of contaminants, a mixture of hydrocarbons and, and the way you would apply a risk-type framework, it didn't seem to me to, to me to be compliant with that or, or to be a valid, valid defensible approach.

So, you know, as uncomfortable as it might be, you know, this was a new client, he really didn't have a longstanding relationship. He didn't really -- we hadn't established that trust relationship. Nonetheless, I did critique this map that he had developed and, and explained myself, and explained rationale for it. And we discussed it, and I think in the end that he agreed that, you know, that my rationale was reasonable, and we moved forward with a different approach.

Q Thank you. In your work, have you become familiar with the oil pollution prevention regulations, 40CFR Part 112?

A I have, yes.

Q And could you state generally your understanding of what those regulations regard?

A Well, the parts of the regulations that I really deal with specifically are the regulations

dealing with the facility response plan requirements, and more specifically, the applicability, so that 40 CFR 11220 is the part of the regulations that I'm most familiar with. Obviously, I need to understand the full regulation in order to implement the rationale.

Q Sure. I have -- I don't know if you can see it here, but CX53, if you want to go to the binders in front of you. It's an illustration that was admitted yesterday and this morning. You recognize this document, yes?

A I do.

Q You were -- can you turn it a little bit, just a little bit?

A Sure, thank you. Thank you.

Q You were in the courtroom yesterday and heard Mr. Swackhammer describe his impression of a D1, D2, D3, D4. Do you have any disagreement with any of the representations that he made?

A I do not.

Q So is there any additional material that you think you need to explain at present to fill in anything you thought Mr. Swackhammer hadn't explained to, to give you a general understanding of D1, D2, D3, D4, and I mean this only in a general sense? I think if we have specific questions, we'll get there, but

I'm trying to save some time with the court and not go through this whole thing again.

A Nothing specific. The only thing that -- in the description that -- no, I think -- you know, I think that D1 is, is the distance to the storm drain. D2, I think, he jumped quickly into, into some, some assumptions about -- D2 is that distance from that storm drain or when it enters the concrete culvert to when it would reach navigable water. To me, that wasn't entirely clear, so I would just clarify that.

Q Sure. And you heard the discussions about the relevance of the half-mile distance between the facility and navigable water. Do you agree with that discussion that you heard yesterday?

A Yes, I do.

Q So what remained relevant once you get into that half-mile discussion you recall was the D3 calculation? So I'd like to ask you more specific calculations about calculating D3.

A Sure.

Q Are you familiar with how D3 is calculated?

A Yes, I am.

Q And is there a formula that suggests how to calculate D3?

A Yes, there's a -- there are two formulas,

essentially, that we would use. The basic formula is that the distance, D3, is velocity times time. So, if you have, you know, something moving at velocity, you know, 15 -- say it's something we're familiar with, 15 miles per hour, and you have that going over an hour, so you've got 15 miles per hour is your velocity times an hour, that would be equal to 15 miles. So that's the basic equation for figuring out distance. In the equation in, in the regulations, there's also a conversion factor to make sure that you're using units, you know, the same units, so you're, you're using feet per second for, for your velocity, but you're using hours for your time. And you convert, just to make sure you're using the same units.

There's a second equation involved, which is the Channing -- Chezy Manning Equation, which is how you determine your velocity. And that -- and we can go through that equation, I don't know if you --

Q Yeah, I don't mean this to be a memory test.

A Sure.

Q So but if I think I understood you correctly, the first formula is D3 equals velocity times time times a constant coefficient.

A Correct.

Q And so the V, velocity, is the second

equation.
A Correct.
Q And I don't mean this to be a memory test, if you have trouble recalling it, please let us know, but do you recall the velocity formula?
A Yes, as I mentioned, it's the Chezy Manning Equation, which is -- I mean, I can -- it's one over N, N times R to the 2/3s, times S to the half. And I can explain what those different variables would be. Would it be helpful for people to look at something here?
(The document referred to was marked for identification as Complainant's Exhibit No. 55.)
BY MR. HELMLINGER:
Q It could be. I could turn you to -- Respondent had the regulations, but I think we also have CX55, I could turn you to that, it's going to be the most clean thing to take a look at.
JUDGE BIRO: Maybe Mr. Michaud could use the board and write out his formula and explain it, if it's significant enough.
MR. HELMLINGER: Do you think it would be helpful to use the board and write?

THE WITNESS: Either, either way --
MR. HELMLINGER: Once we get 55 here. Do you have that?
THE WITNESS: Yeah.
BY MR. HELMLINGER:
Q Do you see CX55?
A Yes, I do.
Q Could you take a moment and familiarize yourself with it and explain for us, if you can, what it is?
A So this is the second declaration run for this case.
Q And what was the purpose of this second declaration?
A There was some questions and in my understanding, there was some questions about my first declaration. So the second declaration was to help clarify some of that information.
Q In this declaration, do you conduct the planning distance calculation somewhat longhand?
A Yes, I do.
Q Would you adopt this declaration as testimony today, given the opportunity?
A Yes, I would.
MR. HELMLINGER: Your Honor, just for the

sake of time, I'd go ahead and admit CX55. It was not on our stipulated list.
JUDGE BIRO: Is there an objection?
MR. MCNEIL: No objection.
JUDGE BIRO: Okay. We're going to admit 55, Complainant's Exhibit 55 into the record.
(The document referred to, previously identified as Complainant's Exhibit No. 55, was received in evidence.)
BY MR. HELMLINGER:
Q So turning to Paragraph 11 on Page 5 of 9 of CX55, are you at that paragraph?
A Yes.
Q So there, it looks like you're laying out the velocity calculation there. So with that, I think it's something for everyone to read along with. Could you go ahead and explain what the different variables are, M, R and S?
A Sure. So M is the Manning's roughness coefficient, so when you're thinking about flow in a channel, in a -- in a concrete channel or a culvert, the important things to think about are at the -- at the contact between the water and the wall, you have friction. And so that's going to affect your, your

flow rating, so before you figure out your velocity. Velocity is, is your flow rate divided by your surface area, so Q divided by surface area. So that gives you your velocity or your -- or your cross-section.
So in order to figure out velocity, in order to figure out your flow rate, you need to take into account the shape of the channel, the, the roughness along the channel, so, for example, if you have a slow winding channel with a lot of trees and branches in it, you're going to have a, a higher Manning's coefficient than you would if you have a nice smooth channel, nice straight and smooth. And so that, that Manning coefficient helps you take into account those kinds of real world conditions.
Q Do the regulations prescribe some approaches towards that or are you left on your own, trying to figure that out?
A Yeah, there's a lot of different coefficients in the literature that the regulations do prescribe or provide some values for UTs.
Q Right. And which value did you use for the Sacramento River Deep Water Channel -- Ship Channel?
A I used a value of .035, and that, that was in consideration of the width of the channel and, and it's a straight channel.

Q And that, I take, is descriptive from the regulation?
A That's right, on the regulation, yes.
Q And can we discuss R, what, what variable to use for R?
A So R is the hydraulic radius. And that's, that's the, the length of contact between the water and the wall, and so there are different ways to calculate that. You can look at the geometry of the channel. You can estimate the depth of the channel, and you can go through a fairly complicated -- not so complicated but more detailed calculation. Or the regulations also give you kind of a shorthand calculation where you would take .667 times the depth, and I can come up with that number.
Q And how did you calculate it?
A I -- for this -- for this, I used that, that, that -- the equation that was provided in the regulations.
Q And how did you determine the depth of the Sacramento River Deep Water Ship Channel?
A There's information in the U.S. Army Corps of Engineers documents that's 30 feet deep. Obviously, that -- you know, that, that's -- it's not 30 feet deep everywhere, but that's, that's the

average that, that they use, and so I thought it was a good assumption.
Q Is that, in your professional experience, a fair assumption for essentially an engineered channel?
A Yes, for a navigation channel, yes.
Q And how about S? What variable did you use for S?
A S is the slope, so essentially, it is the -- you know, the, the other thing I've determined in how fast the water moves is if you're on a -- on a sharp incline, obviously, water is going to be moving much more quickly than if you're on a shallow incline. And so the slope accounts for that, those, again, real world conditions, so you can take that into account.
Slope is calculated by looking at two points, the line and channel. You look at, at an upstream point and a downstream point. And you can use topographic information to say, you know, over that certain distance, what's the change in height and the change in height or the change in distance is, is your slope.
Q And so where did you find your information to enter -- calculate an S?
A So I, I -- you know, I looked at the topography in the area and the topographic maps. I, I

came up with a value of about a five-foot drop over, over 20 miles. I, I then also as I did my calculations, I looked at the calculations that, that were in the respondent's information. And I --
Q How did they compare?
A They compared well. On, on the slope, I used 20 miles, and when I back calculated the slope they used, then I came up with 19.62 miles. So I -- so I plugged in that number instead of my own number, just so we would have a comparable -- you know, comparable inputs anyway.
Q Sure.
A So the inputs compared well, but I, I didn't mean to say that the outputs showed it.
Q So there are just a few more variables to discuss in this formula before we get to the output. T, the output. So we did that -- we've talked about variables you would plug in for the V calculations. Getting back to the first formula, the T time, velocity times time, how do you calculate the time for the purpose of the regulations?
A So the time, as prescribed in the regulations, there are two different planning times you can use. The first is a 15-hour planning time, which is 12 hours response time, plus three hours kind

of establishing your, your equipment, et cetera.
Q And how would that one be used, or in what circumstance?
A That's used for larger active port yards, where, where it's assumed that, that, you know, vessels could get to that type of area more quickly. And then the second one is, is the 27-hour planning time, and it's 24 hours plus three hours, and that's for everything, but a larger port area.
Q Okay. So outside the port area, it would take longer -- the regulations have an assumption that it's a longer response time?
A Correct.
Q It sort of plans accordingly. Do you take those times to be somewhat prescriptive once you pick which box you're in?
A Yes.
Q And so which box would you apply for the location of the VSS facility?
A So, so my answer to that question is typically, you know, if I were doing an applicability review, I -- because this is near the Sacramento Port, Port of Sacramento, I would look -- I would look at both. And in this case, the, the -- I don't know if you would call it conservative, but the more

conservative assumption would be the 15 hours, that that, you know, the response could happen more quickly. That would give you a lower D3, and so that's the -- you know, the low end. If you're evaluating applicability, to me, that would be the more conservative approach, but I would also do a D1 calculation just, just to inform EPA or my client.

Q Sure. Have you -- you've had a, an opportunity in this process to familiarize yourself with the location of the VSS facility; is that correct?

A Right.

Q Do you understand it to be between the essentially head of the Sacramento River Deep Water Channel and its termination in Cache Slough?

A Yes, I do.

MR. HELMLINGER: So, Your Honor, I would like Mr. Michaud to be recognized as an expert for the purpose of applying the FRP regulations. He certainly discussed his chemical and hydrologic expertise, his many years of working with regulations, both for and with EPA and other clients. We have the testimony in the record that these are intended to be clear and easy to apply. And I think that, as he's discussed, there's many more complicated ways to do it, but the

regulations give you a straightforward way to do it, and he's, he's definitely experienced with that.

JUDGE BIRO: Mr. McNeil?

MR. MCNEIL: Your Honor, we would respectfully object. We have no objection to him being designated as an expert chemical engineer or even an expert civil engineer, based on his testimony. But we do not believe a sufficient foundation has been laid for him to be designated as an expert in FRP regulations, which is what I understand the proposal to be. And moreover, as we'd indicated earlier, we believe that the proffered expert designation as being an expert in how a regulation would be interpreted is, is not something for even a chemical engineer. He's not a lawyer, that's the province of this court.

But in this case, there hasn't been any foundation about it, other than he's said he's worked on some FRPs. Thank you.

JUDGE BIRO: Mr. Michaud, how many times have you, in your professional capacity applied these calculations that you've just gone through with us to a real world incident?

THE WITNESS: To -- for applicability review, I, I've applied them four times. To other types of questions, you know, these questions around

hydraulic flow, around, you know, slopes, hydraulic radiuses, I've applied them over the course of 34 years, probably at least dozens of times if not hundreds of times. I mean these are -- these are the kind of -- the stock and trade of, of my profession, so --

JUDGE BIRO: These mathematical calculations?

THE WITNESS: Yes.

JUDGE BIRO: Okay. And you said in terms of the FRP, you've had four opportunities to apply them each during the applicability of the FRP.

THE WITNESS: Correct.

JUDGE BIRO: Okay. Tell me a little bit about those incidents.

THE WITNESS: Sure. So there have been four cases, all under the same contract of EPA. One of the other cases involved an asphalt facility. I, I think I know the geographical location, but I don't want to speculate. Another one involved a coconut oil facility, so once again, it was a viscous liquid, so there, there, there were -- there were questions around viscosity, same questions around secondary containment, around overland flow. And then the fourth case had to do with a more standard oil, a fuel

oil-type situation.

JUDGE BIRO: And in each case, did you go through the whole process of determining the mathematical calculations and then the applicability of an FRP to that facility?

THE WITNESS: Yes, in every case. And in some cases, the -- as I mentioned, the DT planning distance -- D1 planning distance can always be a very complicated calculation. D2, in some cases that I've worked on, has also been relatively complicated. D3 is, is probably the least complicated of the calculations that, that I would do.

JUDGE BIRO: And you were paid for the service and retained to do it in your professional capacity?

THE WITNESS: That's correct.

JUDGE BIRO: Okay. Over objection, I'm going to qualify Mr. Michaud as an expert in applying the FRP regs. Please proceed.

MR. HELMLINGER: Thank you, Your Honor.

BY MR. HELMLINGER:

Q Mr. Michaud, after calculating the D3 calculations, what is your determination of the planning distance, given your preferred time of 15 month -- 15 hours?

A I came up with a planning distance of 22.4 miles, based on that 15 hours.
Q And if you had used the longer response time of 27 hours, what would your planning distance calculation be?
A It would be 40.4 miles.
Q On Page 7 of CX55, on Page 7, at the top of the page CX55, there is a graph. Do you see this?
A Yes, the table.
Q Yes, do you recognize this table?
A Yes, I do.
Q And what is this table?
A This is the table from a -- from one of the Respondent's reports where they did this calculation.
Q And looking at the variables down the line, they have a change in elevation, the, the triangle-shaped delta elevation, change in elevation 5-feet, comes from Google Earth reference. Do you see that?
A Yes.
Q Do you have any reason to believe that's not correct?
A No, I don't.
Q And the distance of 20 miles, based on Google Earth as a reference, do you have any reason to believe that's not correct?

A No, I don't.
Q And the slope, I believe you testified, I'll just ask you, do you have any reason to believe that's not correct?
A No, I don't.
Q And the channel depth, similarly, they have 30 feet?
A I, I agree with that.
Q Do you agree with that?
A Yes.
Q If you look down at the bottom of the table there, they've got D and then it's the calculation of 2.53 miles. Do you agree with that calculation?
A No, I don't.
Q Do you have any reason that you could opine in your professional experience on how you could determine, using the same inputs, an output of 2.53 miles?
A Yes, although I, I tried to reproduce that number. I was able to reproduce that number. The -- what I found was the calculation of velocity didn't use the order of operations correctly.
Q Could you state for the record, just generally, what is the standard order of operations?
A So the standard order of operations is you

would do any exponential calculations first before you do multiplication and division. Multiplication and division would follow from left to right. and then you would do that before you do any subbing or --
Q In your professional experience, how generally accepted is this in -- as a mathematical concept?
A It is the only way to do it.
Q I'd like to ask you some questions about secondary containment and working with asphalt specifically. Have you had an opportunity to review calculations of the volume potential of secondary containment produced by Respondent?
A Yes, I have.
Q And what have you reviewed?
A In my initial review, I looked at secondary containment in all of the areas that were storing oil. I found that -- I found a couple different things in the product manufacturing and storage area, based on the information I had, I determined that secondary containment was insufficient. I also looked at the bulk asphalt storage area. In that area, there was some information in -- that I was given that was unclear to me in terms of -- especially in terms of the integrity of the containment wall. So I did two

different calculations there. One based on one assumption; one based on, on a different assumption.
Q And you mentioned integrity of the wall, how do you reference that? Or the containment that you tested, how do you -- how do you mean that to be?
A So in the -- I believe it was the consolidated plan, the 2014 consolidated plan, also in Haley & Aldrich, a report was included in that plan. There was a cross-sectional diagram of the containment wall around the bulk asphalt storage area. There was a label in that diagram that showed maximum fluid height.
Q If I could --
A Sure, yeah.
Q -- turn you, perhaps, to CX15 on Page 13.
JUDGE BIRO: What exhibit number, again? What exhibit number?
MR. HELMLINGER: 15.
JUDGE BIRO: Thank you.
MR. HELMLINGER: Page 13. Do you have that in front of you?
THE WITNESS: Yes, I do.
BY MR. HELMLINGER:
Q Is this the diagram you were mentioning?
A Yes, it is.

Q Could you describe the diagram?
A Yeah, so the, the, the caption is, "Detail on asphalt, cement, AST containment area, dike wall provided by DSS not to scale."
Q Do you see to the left of this diagram, written vertically bottom to top, where it says, "Max fluid height, Max Fluid HT"?
A Yes, and the dimension on that is three-foot-two-inches.
Q Are you a structural engineer, Mr. Michaud?
A I am not. I mean I practice as a civil engineer, but that's not my speciality.
Q With that caveat, what does that reference to you -- mean to you?
A As a hydraulic engineer, if I were to design a channel or a -- or a wall that was to contain liquid, the basis for my design, my design basis, I would put -- I mean I may put -- I would probably put on the diagram, so if I were to design a channel that was dealing with water and that channel was based on a two-foot flow, I would give that to my structural engineer, and I would say here's, here's my design criteria. This wall needs to hold, hold up to two feet. And then what I might get back from my structural engineer is a cross-section like this,

where they say, okay, here's the -- here's the design criteria you gave me, and here's the wall that I'm -- here, here's, here's the wall that needs to be constructed in order to meet that requirement.
Q Sure. And what cautions or considerations would you have if the fluid height were above that, that you would give your engineer in your table?
A So if, if I were to get this drawing, if I were to say be an engineer for this facility, I would be very cautious about allowing fluid to get above that height because that, that structural engineer who signed -- stamped and signed this document said I designed this wall for three-foot-two-inches.
Q So have you had an opportunity to review the secondary containment designs for the VSS facility?
A Yes, I have.
Q Particularly with reference to the, the bulk product storage area, have you calculated the capacity of that secondary containment volume?
A Yes, I have.
Q And if you calculated that capacity with -- using the, the maximum wall height of three-foot-two, what is your opinion as to the sufficiency of secondary containment?
A: At three-foot-two-inches, I found that was

insufficient.
Q And if the wall were at a maximum fluid height of four-foot-two, what would that -- what would your opinion be?
A So just to clarify, I made my opinion based on a four-foot-zero wall height, and I don't know if you want me to explain that. It's not your question, so --
Q We'll circle back to that.
A Sure. At four-foot-zero, I found it to be sufficient to contain the capacity of the largest tank in the area, plus sufficient volume for free-borne.
Q Free-borne?
A Free-borne sources, thank you.
Q So if you look back at that illustration on Page 13 of CX15, do you see where it suggests four-foot-two max height?
A Yes, I do.
Q So why are you not using that as your calculation for the maximum wall height?
A So when I see something labeled like max, when you're looking at containment of a fluid or a liquid, it's not really important what the maximum wall height is. What's important is, is what the minimum elevation on that wall is. So just assuming

that the wall is level, I'll assume that the wall is level, what is the maximum height or what is the minimum height of that wall? I, I don't care about the maximum height, I don't care about the minimum height. Once that liquid gets up to that minimum height, it's going to flow over.
And so the word 'max', to me, in this diagram made me think twice. So what I did is I looked at the Haley & Aldrich calculations and saw what they used, and they used a four-foot-zero in their calculation. So I adopted that as, as the basis for my calculations.
Q Have you had an opportunity to consider the volume of the tank we heard testimony about yesterday, Tank 865?
A Yes, I have.
Q Have you had an opportunity to calculate the impact of that volume on the potential secondary containment at the VSS facility?
A Yes, I have.
Q Do you have an opinion if the volume of that tank is inside of the bulk storage area that we were discussing, whether that impacts the potential risk for sufficiency of secondary containment?
A Yes, so when you do the secondary

containment calculation, the calculation assumes that the largest container, the largest oil tank -- assumes that that tank is no longer there, so that footprint comes out, and the total volume of that tank, you calculate the total capacity of that tank or you calculate the volume that that will take up. In order to do that calculation, you look at the, the total area, containment area, so your total square footage of that area, and then you would have height, and height times area is for volume.

In order to do that calculation, we also have to take into account that there may be other things in that area that would displace volume. So if you have a tank, like Tank 865, that is -- that is not going to allow liquid into that tank, that's going to displace the liquid and so you're going to have a slightly higher -- you have less volume, effective volume in your area. So you have slightly higher elevation when all of that liquid is in there.

So I calculated that it had a minimal effect of .32 inches, but it will affect, yes.

Q Does that affect your conclusions based on the wall height if you used three-foot-two as your max fluid height?

A It does not affect that conclusion. It

makes that conclusion slightly stronger.

Q Does that affect your conclusion if you use a four-foot or four-foot-two wall height?

A It does not.

Q So it would be sufficient in that case?

A Correct.

Q Have you had an opportunity in this case to consider the thermoplastic properties of asphalt cement?

A Yes.

Q And are there any maybe sort of common analogies for a layperson like myself, not an engineer, to think of asphalt and cement at various temperatures that you could suggest?

A Sure, yeah. And just as, as a matter of explanation, so when you're looking at, at questions around flow of asphalt, asphalt is -- it's a thermoplastic material, meaning that, that as it gets heated, it's more fluid, it's more flowable. As it -- as it cools, it, it solidifies. And one of the -- one of the things about thermoplastic materials is that that heating and cooling process can take place a number of times and it won't lose its or it won't degrade its chemical and physical properties. It won't change significantly.

So, so one of the things I account for in all of my equations, dealing with any kind of hydrodynamic flow, not, not the volume calculations but the flow-related calculations is at viscosity and the fact that viscosity will be variable over time. So I know you didn't ask that question, but I wanted to explain.

Q Well, let me give you a different -- let me rephrase -- reset the question a little bit.

A Sure.

Q I think we understand that the VSS facility holds its, or we would say given -- if we don't understand this, holds asphaltic cement at about 250 degrees. Given that, could you describe in some commonly understandable analogs what the flow of that material might look like?

A Sure. So at 250 degrees, I, I -- I can't give you an exact viscosity, but the viscosity or, or, which is a way of measuring that kind of thickness, the stickiness of the material, would be somewhere less thick -- or more thick than maple syrup and somewhat less thick than honey or molasses.

Q And if the temperature came down to 200 degrees, on a -- on your scale of molasses to syrup --

A Right, right. So, so it's -- so over that

first period where it's dropping say from 250, 260 degrees down to 200 degrees, the viscosity begins to -- it begins to thicken, so your viscosity begins to rise, and it would approach something on the order of, of honey, maybe not quite there, it, it would still be much less thick than something like molasses. It would be something like motor oil, if you're familiar with like an SA -- SA30- or 40-grade motor oil.

Q Yes, I'm familiar with that. I don't know that everybody else is.

A Yeah, that's why I was using food.

Q Given your consideration, have you had an opportunity to consider what a worst case discharge of -- given a 2.5-million gallon tank of material with this thermoplastic property might look like in examples or considerations that you might've observed?

A Sure. There's, there's a, a classic example of this type of spill where you've got a highly viscous material that, that I've, you know, looked at over the years. It, it occurred in 1919 in Boston. It's known as the Molasses Flood, the Great Molasses Flood. And that was -- that occurred -- it was molasses, obviously molasses had, had been delivered a few days before. It was about 40 degrees at the time.

And so it was -- it was in a cool, cooled condition, relative to, you know, what would be in your kitchen.

It was a two million-gallon tank. It, it ruptured and collapsed; 21 people died, 150 people were injured. And estimates were that, you know, it was a 50-foot-tall tank, to a million gallons, estimates were that a 25-foot wave of molasses engulfed the neighborhood, 35 miles an hour, traveling at one point, it wiped out two city blocks, knocked over a fire station, knocked over train cars. It was a fairly significant disaster.

Q Is this a disaster that's generally studied in the field of thermoplastic dynamics?

A It's, it's, it's, it's, it's a really good way to illustrate, you know, the, the somewhat complicated questions around what happens when, when a viscous fluid is released, you know, when, when the containment structure around viscous fluid fails. It's, it's just a really good illustration. It -- the -- you know, there are a lot of forces on this fluid. It's not like, you know, when you look at pavement on the street, which are actually different -- it's, it's different chemicals than material in asphalt cement. But that's what people think of, and so I think when you think about something like molasses that people

can relate to, when you think about, you know, suddenly, this stuff is released and you've got gravity working, you've got momentum working, it, it's, it's a tragic but useful illustration of, of what could happen.

Q Sure. Have you had an opportunity to consider this type of flow scenario with the facts that you understand about the VSS facility?

A Yes, I have.

Q Could you describe generally what you looked at to -- in those considerations?

A Sure. So I looked at different flow scenarios, different reasonable ways that a tank could fail, more in terms of, of the directing or directional flow. So, for example, you could look at flow in all directions from the tank, so 360-degree flow, or you could look at flow of say, you know, if half the tank were to fail and you've got 180-degrees. So I looked at that range from 360 to 45 degrees, just to give me a sense of, of how, how that would change the calculations. And I think we, we -- well, at least I, I recognize that in any failure situation, it's, it's not like you're just going to lift up the tank and it's going to move out 360 degrees. There are going to be all kinds of debris.

There are going to be different things that are going to change the direction of velocity and momentum of that flow. So I just looked at that range, I looked at, you know, the, the height of the -- of the asphalt material in the tank and when you start the calculation, the height in the tank is, is the total height that it could be. Outside the tank, you've got nothing, and so you've got zero height. And then, then I run the model where, where you look at how that height will change as, as the asphalt falls here, it's going to start moving outwards. And then eventually, at some point in the height, in the footprint of the tank and beyond the footprint of the tank, it's going to be about the same.

And at that point, then you've got more of a sheet flow scenario and you can model that as, as a sheet flow.

Q And in these different release scenarios that you might've considered, you mentioned 360-degree failure of the tank. Is that a probable situation?

A No, that's improbable.

Q What would be a more probable situation?

A If, if a part of the tank were to fail, if there was a structural failure in the tank, you would

have a, a more direct inflow. It's, it's hard for me to imagine a, a scenario where you would have a 360-degree flow.

Q Have you had the opportunity to calculate various release scenarios based on more specific failures than a tank?

A So not, not a specific failure, like this specific tank, you know, this specific seam failed or, or this -- you, you know, this -- you know, this -- so not, not at like a specific condition, but a scenario or range of conditions. But again, to -- you know, as an engineer, as, as the person who's asked to evaluate applicability, I, I think it's a mistake to, to make an assumption that there's, there's -- you know, here's the one scenario where I'm going to examine and I'm going to give my clients an answer based on that scenario.

So I, I look at a range of scenarios, a possible range, just to --

Q I'm sorry, could you describe what that range might be that you look at?

A Yeah. So in this case, I looked at 45-degree, which would be a, a --

Q An eighth.

A -- an eighth of a tank versus I also looked

specifically at 90-degrees, which would be a quarter of a tank and 180-degrees, half-a-tank, and 360, and that just gives me the range of, okay, given the fact that we don't know exactly how a tank could fail and how different factors would come into the directional flow from that tank, this will give you a picture of what could happen under the range of scenarios.

Q So given this range of scenarios, had you calculated whether asphalt heated to 250 degrees or so released in any situations, 360 degrees, 180 degrees, 90 degrees, 45 degrees, any other situations had probability of reaching the Sacramento Deep Water Ship Channel?

A Yes, I estimated that under that 180, 90, 45, any of those scenarios that there would be a high probability or a reasonable -- let me put it this way, a reasonable probability that it would reach the ship channel.

Q Look at -- pardon me -- in your calculations, did you consider the -- call it contour of the grading, maybe, of the bulk storage containment area?

A Absolutely. Considering the topography is critical in this kind of analysis because you're, you're looking at how, how your wave height in that

initial collapse scenario, how that wave height could be affected by barriers, by topography, so fill in the low areas before it's starting to peak over higher areas. And when I say that, I don't mean it's going to fill in everything. It's going to -- in that -- in that direction of the wave, it'll, it'll -- it's not going to travel over those low areas. So you have to take into account the low areas, the high areas, et cetera.

Q Sure. So you're talking about waves and heights and whatnot. How about just sort of flow along the top of this contoured area? How might that -- can you model that out?

A I'm not sure I understood the question.

Q Are you familiar with the Gau model, if I'm pronouncing that right, G-A-U?

A G-U-O.

Q G-U-O. So I'm not pronouncing it right.

A That's okay.

Q Are you familiar with the Guo model?

A Yes, I am.

Q And can you describe the Guo model?

A Yes, so, so in my calculations, so Guo model is, is applicable to sheet flow, and so I use one model to, to -- for the initial splash phase or the

collapse phase and one model, the way it's set up is that you -- in the paper that outlines this model or that this -- there's no explanation about how you determine that initial splash, which is why I came up with an approach to determine that.

Once you determine that initial splash, then you treat it as, as more of a sheet flow or, you know, if you imagine -- and one way to think about it is if you like pour -- slowly pour pancake batter into -- into a frying pan, that batter's going to move out kind of in a nice orderly fashion, if you're -- if you're doing it right, until it gets to a point where it's, it's, it's hardened up or it's in -- it's a little different than that -- the batter's heating, but asphalt is cooling, but it's going to get to a point where it hardens up and it stops flowing.

So the Guo model is a way of, of valuing that for asphalt, specifically, where, where over, over a period of times, it moves out like a sheet, but eventually, it, it gets to the point where the viscosity is such that it hardens up and it stops flowing.

Q I'd like to give you an example that I have in my head. You're discussing waves and sheet flows and that sort of thing, and maybe it's because I live

in California and you don't, but I'm thinking of a wave hits the beach, the beach has a little bit of an incline and once the wave crashes, you still have that sort of flow that runs out the side of the beach, is that -- when you say sheet flow or run-out, is that a fair assumption or why not?

A Sure. If, if the situation is going to have to be in the splash phase, the, the -- your leading edge has not crested a, a barrier, a high point in the topography, then that, that could happen. And, and so you would follow the Guo model and I model of the forward momentum, but also the fact that you're going to have some reverse momentum because now gravity is working in a different direction. If -- in this case and several of the scenarios that I analyzed, if you've already exceeded that, that peak point, then you're going to model it. And then the Guo model assumes that there's a slope. And so the Guo model would be applicable for a slope kind of over that peak down, in this case, to the shipping channel, you could also use it to model anything that remains kind of behind the peak. and you would model that in the other direction, away from the ship channel.

Q Sure. This Guo model, do you understand it to be generally accepted in your field of practice?

A In, in the -- in the field of asphalt sheet flow, yes.
Q Do you have experience with -- you, you mentioned that you looked at Respondent's reports, they used the same model, essentially?
A That's correct, but they used it in, in different ways than I used it.
Q Could you explain how their ways are different?
A The Respondent used the model both for the collapse phase and for the run-out phase or the post-splash phase. I, I don't think it's appropriate to use for the splash phase because it's, it's a sheet flow model, and column collapse is not sheet flow. So but I didn't do an agreement that's application kind of in the -- in the run-out phase after the initial splash.
Q So --
A And again, I used it -- I used it slightly differently than, than maybe some other people do, but --
Q Right. So in that run-off phase, assuming a 180-degree tank collapse, does your calculation exceed 200 feet of run-out of the --
A Yes, yes.

Q -- asphalt cement?
A Yes.
Q And if the tank collapses at 90 degrees, so in other words, if a quarter of the tank collapses, does it exceed 200 feet?
A Yes.
Q And at a 45-degree or 40-degree tank collapse, an eighth of a tank collapse, would it reach beyond 200 feet?
A Yes, and, and to clarify, that 200 feet that I have included or that I mentioned to you before, that's 200 feet from the property boundary, so and the answer to that is yes, it would exceed 200 feet and would reach the deep water ship channel.
MR. HELMLINGER: Ten seconds, Your Honor.
MR. MCNEIL: Your Honor, I do have -- I do have cross as well if we could take just a short break.
JUDGE BIRO: Sure, we will. That's -- as soon as Mr. Helmlinger tells us he's done, we'll take a break.
MR. MCNEIL: Oh, I thought he was done.
JUDGE BIRO: Yeah.
MR. HELMLINGER: I'm sorry, I missed that exchange.

JUDGE BIRO: Please proceed. We're good.
MR. HELMLINGER: Oh, sure. I'm sorry. Didn't know if there was a question for me to answer.
BY MR. HELMLINGER:
Q Mr. Michaud, one last question, if you -- and, and this goes to the fact of the D3 calculation, if you put any inputs into the D3 calculation that were not zeroes, in your calculation, based on the testimony you heard yesterday as to what was a Fish & Wildlife sensitive environment, is there any D3 that's not going to impact -- any distance that changes anything? So hypothetically, if you put -- let's start this over.
If you took any positive number for any of the inputs into your D3 calculation, whether it's V or T or S, how far would that D3 calculation extend in that distance to -- from the Sacramento Deep Water Ship Channel to what we heard yesterday's testimony is a Fish & Wildlife Sensitive Environment?
JUDGE BIRO: Do you understand that question?
THE WITNESS: Yes, I do.
MR. HELMLINGER: It's a -- it's kind of heavy. It's weird esoteric math, I get it. I can restate it if it would please Your Honor.

JUDGE BIRO: If he understands, and then you explain it to me.
THE WITNESS: Yeah, if I could provide a little context. So typically for an applicability review, which is -- which is what I'm asked to do, I think we heard Mr. Swackhammer testify yesterday that, that in every case, you're going to do the full D3 calculation. It's, it's useful for applicability, but it's also useful for planning. It's also necessary for planning. To be clear, my, my goal is just applicability. And so the way I do my D3 calculations is the first thing I do is I, I look to, you know, where, where a release could enter navigable water. That's the start, the starting point of my, my D3.
And then typically what I would do is I would -- I would then look -- I would look downstream from there and find, you know -- and see if there's a Fish and Wildlife sensitive environment. If that is, you know, 10 miles away, I would then calculate, you know, when D3 reached that point, if it's 20 miles away, I would probably just do my full D3 calculation and see whether that D3 exceeds 20 miles. In which case -- in, in any case, if it was more than just, just, you know, right there, I would typically do full D3 calculations. Now, now, I say typically because

sometimes it's really easy to do a D3 calculation if you've got a nice straight channel. Sometimes it can take a lot of time, and you don't have good data. And so as an engineer, to make sure that I'm not -- that, that I'm using my client's monies effectively, I'll probably do the easy part of the calculation first, see if there's a Fish & Wildlife sensitive environment within that area, within that distance, and if so, then, then that's the end of my analysis.

I'll conclude that, yes, it, it -- the facility is within a distance that could injure this resource. In this case or, you know, and then I'm, I'm continuing to do that until the D3 is, is, is done. If, if, if I don't find Fish & Wildlife sensitive environment, I would conclude that no, it does not meet that criteria.

In this case, because of the Sacramento Deep Water Ship Channel is a Fish and Wildlife Sensitive Environment, I concluded that as soon as that material reaches that, that resource, it will cause injury to that, it will impact that environment, so my conclusion in, in my report was that D3 is some value greater than zero because it will -- it will move into that, that body of water. I established that through my calculations, if it moves into that body of water

by one inch, it will -- it will have impact to that body of water, according to the regulations.

If it moves into it by two miles, it will have impacted it, at 20 miles, it will have impacted it. So that's why it may have been confusing. That's why I used the, the term non-zero, but my, my intention there was, was to say that any, any, any distance would -- I would reach the same conclusion regardless of the distance for D3.

MR. HELMLINGER: I think you phrased it much better than my question. Thank you.

JUDGE BIRO: Okay. Mr. McNeil, how long would you like to prepare for your cross?

MR. MCNEIL: I just need a short break.

JUDGE BIRO: A short break, okay. So we'll stand in recess until 10:20. Would that be sufficient?

MR. MCNEIL: Yes.

JUDGE BIRO: Okay.

(Whereupon, a brief recess was taken.)

JUDGE BIRO: We're going back on the record. Okay.

Mr. McNeil, are you prepared?

MR. MCNEIL: Yes, thank you, You Honor.

JUDGE BIRO: Okay. Please begin.

CROSS-EXAMINATION

BY MR. MCNEIL:

Q Good morning, Mr. Michaud.

A Good morning.

Q I'd like to ask you a couple of questions that you had kind of provided answers earlier to Mr. Helmlinger. And the first one I, I, I'm gathering you're sharing with us, you know, the tragedy that occurred in Boston is historical or an anecdotal story that you've -- that you've read about or been told about?

A That is correct.

Q Okay. So you -- I think you said -- you said the year was 1919?

A I believe that's correct.

Q So I'm guessing you weren't --

A Obviously.

Q And you -- well, my dad was born in 1920, so it's -- maybe it's possible, but you don't -- you don't look as old as he does. And so in terms of the -- I don't think anybody would contest the tragedy you described, but in terms of the, the components or the factors and the site conditions, the tank volume, height of the tank, height of the wave, you certainly don't have any first-hand knowledge of that; is that

right?

A That's right.

Q Is that based on things you've been told or things you've heard?

A It's based on things that I've read.

Q Okay. And were they in scholarly publications or more like news articles or --

A Not, not scholarly publications.

Q Okay. So kind of second-hand story?

A Right, stories that were reported in, in articles and, you know, there have been some studies, but I don't think they have been formally published. I know Harvard University did do some studies, but I think they were more for academic purposes and less, less, you know, what I would call a, a, you know, primary journal.

Q So, for example, in the Harvard University study, do they -- do they also corroborate the volume of the tank contents?

A I'm not familiar enough with the studies, I don't think --.

Q Or the height or the wave or anything?

A Again, you know, I'm not that familiar with --

Q As you sit here today? So you can't share

that with us?
A I, I'm not that familiar with that study. As I said, it's not in a published journal. It's more, you know, possibly a conference presentation that I saw. I'm not exactly sure.
Q And, you know, again, without minimizing at all the significance of that event, you didn't use anything from that in your analysis of VSS's potential FRP applicability of understanding, is that right?
A That's correct. It was more of an illustrative example, but it's not anything I used quantitatively or in any other way.
Q Mr. Michaud, may I ask you if you had available to you, or if you didn't have available to you, if you requested any details regarding the construction of, in this case, Tank 2001?
A The only information I have was what was in that consolidated plan, so not of the construction of the tank itself, but the dimensions of the tank is the information that I had.
Q Would it -- would it make a difference to you in doing your FRP applicability analysis if the tank were -- if I used the term 'vertical seam', do you understand what that is?
A Yes.

Q Okay. And if I used the term 'brick grid', do you understand what that is?
A Yes, in general, yes.
Q So would it -- okay, great. If you -- if you knew it was one, the vertical seam, versus the other, the brick grid, is that something that if you had that information, you would try to account for in your analysis?
A The -- you know, the moment of failure, the direction in which the failure would occur, those, those types of questions are really beyond what I would consider in an FRP applicability analysis. What I'm really trying to do is just look at, you know, a reasonable set of scenarios and really for more of a volumetric and directional standpoint, you know, calculating what your fan area might be than really trying to play through the, you know, innumerable scenarios that, that might occur. So I'm just trying to come up with a range of, of answers.
Q Okay. So, so tank construction you wouldn't consider to be a reasonable factor to refer to?
A It's beyond the scope of what I would consider.
Q And what's the reason for that?
A I mean the regulations -- first of all, the

regulations are just looking at the questions over flow. So I'm, I'm really just looking at -- and to use the Guo model, you want to know, you know, what could be the volume that could be released and looking at dimensions, really, really kind of larger dimensions like the height -- the height that the fluid could start at. So more the hydraulic questions and less the how could this occur questions, but more, you know, what are a number of -- what are the range of scenarios? And those scenarios are, you know, more or less infinite that could occur.
I generally have -- I'm, I'm certainly not paid that much money to, to, to look at every single scenario, but I'm paid to evaluate a reasonable range of outcomes I would predict.
Q And so tank construction would just not be reasonable at this step of the analysis is your -- is your view?
A That's my view, yes.
Q Now, you did, excuse me, mention that flow direction would be -- would be relevant; is that right?
A Certainly, yes.
Q Can you help me understand and, and I guess just preliminarily my -- you did -- well, you did a

report dated August 23, 2016, right?
A That's correct.
Q And in your declaration, you said -- you said you stand by that report, right?
A I do.
Q And you do today, as you sit here, right?
A Yes, I do. I've had an opportunity to review that report and make a couple corrections, which I believe I also stated in my declaration.
Q Yes, and just so we can all be on the same page, but without going into a lot of schlemiel, the ones I'm aware of, just sort of topically are you submitted a second declaration that presented on the secondary containment issue that Mr. Helmlinger had asked you about.
A Correct.
Q What I would characterize, and please again correct me, as sort of a conditional refresher or update to your earlier conclusion, and that was if the integrity of the retaining wall met certain criteria, then secondary containment was -- would be sufficient, but if it didn't, it would be insufficient; is that fair for just --
A Well, I, I drew that conclusion in my first initial report in 2016. I, I didn't revise that

conclusion. I did revise the, the calculation. I didn't look at the impact of Tank 865 in the bulk asphalt storage area. It did not change my conclusions from the original report.

Q Okay. Very good. So and then I think the other matter that you were alluding to was you provided a more -- a more detailed planning distance calculation than you had provided earlier?

A That's correct. I, I explained the rationale for that, that statement of non-zero and the kind of math behind that and that that is actually a quantitative result that, that I did explain that if I were to carry out the calculation, here's what I would have or what I would have concluded.

Q Okay.

A Yes.

Q And so were those the two matters you referred to earlier that you had -- and I don't -- I'm not going to say that were incorrect, but that you had revised since your 2016 report?

A I think I also clarified the question around information I used or, or I looked at another piece of information in terms of the status of a deep water shipping channel, in terms of being a Fish & Wildlife sensitive environment.

Q Very fine. Anything else?

A To the best of my recollection, that's it.

Q Well, so going back to some of the tables that are in that -- in calculations that you did in the 2016 report, I just want to see if I'm understanding. Mr. Helmlinger asked you about flow scenarios and I believe you said something about you want to take into account a reasonable directional flow or words to that effect, is that --

A A reasonable range of scenarios --

Q Reasonable.

A -- included in one of the variables is the direction of the flow.

Q And so I guess my question for you is did you consider that the -- that the flow would vary over the course of the time of the release? And specifically, because you talked about a 360-degree initial splash; is that right?

A That could be one of the assumptions, that it's a 360-degree splash.

Q And at the same time, would you not agree that at a certain point under, you know, any reasonable scenario, that radius would no longer be 360 degrees?

A I'm not sure I understand the question.

Q Well, I think when you -- when you were testifying about 360 degrees in the initial splash, I think what you were saying is basically, the -- when the -- under the hypothetical scenario, that the entire volume of the tank is filled instantaneously, then it would all basically fall right around -- you know, around the tank, almost, you know, for calculation purposes, in a circle?

A That is one of the scenarios. It's not the only scenario I looked at, but assuming that it is -- we used the 360-degree splash center, which is something I do because that's one end of your -- if you're looking at a range of scenarios, that's one end of that range, and based on that, yes, under that scenario, that initial splash, that's what I would use, that assumption that that -- for that initial really dynamic activity, you know, that, that is essentially what would occur, but, you know, I mean I take into account geographic factors. So I don't know if I can really say my conclusion would be a circle --

(Simultaneous discussion.)

Q Well, let me ask you this, for purposes of the FRP applicability in this case, what do you think is -- what would be reasonably expected from this particular tank that you had used as a -- as a model,

2001?

A And so I -- that's a hard question to answer. As I said, there, there are an infinite number of scenarios, and so you've got -- you've got different tank failure scenarios that could result in different directional flows that could result in different -- you know, all kinds of different situations, you've got geography to account for, you know, the direction could be towards the channel; it could be in a different direction. It could be towards the railroad tracks, for example. It could be -- there seems to be a berm on the other side of the tank. It could be towards that. All of those directions, you know, so those are all different scenarios. And, and the question of what is reasonable, I, I cannot and I do not evaluate every single scenario.

What I try to do is evaluate a scenario that would or could, rather -- a scenario that could result in, in a discharge to a Fish & Wildlife sensitive environment or to a storm drain, and I'll look at those, those scenarios, and I'll try to come up with a reasonable, you know -- again, reasonable range of scenarios under which that could occur and so that's how I try and answer the question which is asked in

the regulations of could this occur in that -- and so I don't know if that answers your question. I'm sorry.

Q Well, I guess -- I guess what I'm curious about is, you know, you say there's an infinite range of possibilities, and I -- you know, I think that, you know, anybody would probably agree with you. But if there's an infinite range of possibilities, then where do you -- you know, where do you draw the line in terms of you're going to -- because if that's the case, you wouldn't need the regulations, right, because there's an infinite number of scenarios. So there's always a possibility, right?

A No, there's not always a possibility.

Q So how do you -- so how -- so how do you --

A Maybe infinite is, is, is the wrong term, it's a -- it's a term of art. There are so many possibilities.

Q But that's my -- that's my question is I think you -- I think you testified in response to one of Mr. Helmlinger's questions that you were trying to find, you know, something that would have a reasonable expectation of reaching that. So let's just, you know, use that -- let's just say that's, you know, a fair interpretation of the regulations.

So how do you draw the line when you're doing your applicability analysis if you can have an infinite range of possibilities?

A Sure. Yeah, so I think there -- certainly, there are possibilities that would not result in, in the oil -- the asphalt reaching that shipping channel. For instance, just to give an example, if, if the tank were empty when something happened, and so I can -- I -- rather than try to find all of the scenarios that would not result in that, to me, that's not a very effective use of my time, what I would do is, is I would look at or what I do is I look at scenarios under which it could reach the Sacramento Deep Water Shipping Channel. So the first thing in that scenario would be direction.

So I -- so I ask myself is there -- are there a reasonable number of scenarios where, where the direction of flow, where the tank would fail in, in a place that is perpendicular to or is -- the flow would head in that direction. If, if the answer to that is no, there's no way the tank could ever fail on that side, for some reason, then I would say okay, that's not reasonable. But if there are a number of scenarios where it could fail on that side, if I can say reasonably to myself yes, that could happen --

Q There's a reasonable expectation.

A Yeah. Then I'll say okay, reasonable, I've met that hurdle for that for direction.

Q Okay.

A And then I will say -- then I'll ask myself, you know, depth, what could be the depth of that tank, you know? Yes, it could be two inches, or it could be, you know, conceivably be 40 feet. And so I'd ask myself is it -- is it reasonable to assume that it could be 40 feet. And then I will ask myself is it reasonable to assume that it could be a 360-degree spread, a 45-degree spread? You know, what are some reasonable assumptions around that? And so I, I just lay around that, and, and really try to test myself every single time I, I make -- build a scenario, is -- am I being reasonable or am I -- am, you know, trying to find an answer here.

My job as an engineer is to be as objective as possible, to give my clients, even if they don't want to hear the answer, the answer that my objective, rational, you know, well-documented approach would, would -- the answer that I come up with.

Q And so direction of flow would implicate, would it not, slope or topography?

A Yes.

Q And did you review topographical or sloping information as part of your applicability analysis?

A Yes, I did.

Q And what did you -- do you remember what you reviewed?

A There -- I've reviewed -- initially I reviewed some information that was in the consolidated plan. There's some topographic information in the -- in, in that plan. I looked at, you know, topographic information at the edge of the property, and then information about the height of the shipping channel, the water in the shipping channel, the elevation there. So I looked at a whole range of different inputs to try and create that profile.

Q And the consolidated plan, you mean the WHF consolidated plan that was from 2014 that had some -- at least, I think, one figure that has some topographical survey information?

A It was a 2014 -- it was a 2014 document. I don't know who the authors of that document were.

Q But do you recall seeing a figure that had topographical --

A Yes.

Q -- survey elevations of the site?

A Yes. My recollection is Figure 7, but --

Q What's that?
A Yes, I did see that figure.
Q Figure 7?
A Yes.
Q That is -- is that -- is that what you said?
A That was my recollection, but I could be incorrect.
Q Yeah. No, that's correct.
A Okay.
Q So I'd like to -- I don't know if -- I don't think Mr. -- I think Mr. Helmlinger referred to your report, but I don't know if we actually asked you to take a look at it, but if you have it, the binder's in front of you. It's CX14. This is your 2016 report.
A Okay.
Q And I apologize, but for this one thing I'm going to ask you about before we look at that, and it's something you had testified earlier to. You had -- you had observed or you testified that you had observed that the Guo model did not have a specific input perimeter for column collapse or initial splash.
A The model requires that you assume what that splash radius would be but doesn't really provide any guidance on how to calculate that.
Q So you -- so you looked to another source;

am I correct?
A That's correct.
Q And that was the Roche model?
A Correct.
Q From 2008?
A Right.
Q And what did you glean and then apply in your applicability analysis from that model in this case?
A Yeah, so that's a model where a viscous material was, was -- the model was, was established to evaluate how a viscous material would, would react under conditions where the containment was, was suddenly removed and the initial viscosity of that was modified in some way. It modified such that the -- so viscosity is, is a matter of intermolecular forces. So that's what creates the viscosity. There's some stickiness as molecules move over one another, as they're flowing. And so this, this paper I used to process for kind of changing those intermolecular forces, such as what happened when heated asphalt changes the, the stickiness of the molecules as they move across one another. And that's what makes it more viscous and more -- less viscous and more liquid.
And so, so the model evaluated what would

happen if, all of the sudden, containment were, were removed when this kind of pre -- pre, you know, condition was applicable, was, was there. And so it evaluated how, how the column would -- the shape of the wave would, would happen. So you start with, you know, the situation, as I explained before, where you have the material above your footprint, your original footprint, like a tank or, or some sort of container.
So the material above that -- and then initially, you have nothing on the outside of that. You remove the containment and that, that shape of that wave over time is going to change. So initially, you would have something where you've got, you know, the volume is still pretty high above your footprint, but you're starting to see something move out from the bottom. So you think about that, you know, the wave moving out from the bottom, things are pushing down and that -- and that weight is moving out.
And then that shape will change, after 10 seconds, it'll look different or say after one second, it'll look different; two seconds, it'll look different. And so they just modeled that shape. And then they compared the initial kind of configuration of, of the -- of the initial container, so volume to height to volume. And they looked at some

dimensionless kind of parameters and how they moved over time and they found that under a number of different initial conditions, they would -- the shapes of the curves when you plotted them looks very similar.
And so I used that data, I used that information to, to kind of model that, the shape of that curve, how that -- how the heights of that leading edge would move out over time and how fast they would move out.
Q Okay, thank you. And just one question to clarify, you mentioned it was a viscous material, which is, of course, generally what we have at VSS, right? And do you recall what the viscous material was in that -- in the Roche report?
A I believe they were modeling pyroclastic flows, which are flows from volcanic situations. I think it was some type of granular material where the, the friction between the grains is analogous of friction that you would see in the intermolecular, you know, at, at a finer scale intermolecular force.
Q I see, okay. So anyway, turning back to your report, let's -- if you wouldn't mind, let's take a look at Page 16 of 20, which is Table 4, Column Collapse Calculations. And I believe this is what you

were referring to a moment ago. But I'd like to just ask you a couple of questions about the calculation. Would that be all right?

A Sure.

Q So the -- so if we go left to right above the top, there's units, which is, you know, relatively self-explanatory. Then there are three columns. The first says initial. The second says first transition, and the third says second transition. Can you help us understand what those three are?

A Sure. So initial is, is the, the starting point. So before the containment is moved or is, you know, no longer there, so that's where you start. So if you look at the curves, if you look at how they plotted the data, there are some inflections in the curves, changes in the slope. And so during the first -- to the best of my recollection, during the first transition, you see -- kind of in general terms, you see the wave has a certain shape to it, where it's kind of higher towards -- closer in towards where it initially started. And then, then it's, you know, kind of lower, but the leading edge is moving out.

That shape changes at some point, and you can see that in the data, the slope of the curve, and I'm sorry this is so abstract, but the curve -- you

know, the slope of the curve changes, and so where that changes, there's, there's something happening physically in that -- in the -- in the relationship between gravity, momentum, viscosity that is changing. And so, so I modeled that first part that looks, you know, very kind of linear. Then I modeled the second part that looks linear in a different way, you know, the, the way it's changing is different.

Q That's the first -- so that's the initial and the first transition.

A So the first transition is where -- is where it, it -- the first shape changes and the second -- and so now we're in a period where it's moving differently than it did initially.

Q So where it starts to level is the first transition or the second transition?

JUDGE BIRO: Do you want to draw it for us?

THE WITNESS: I, I -- if I had -- if I had the paper itself, I would draw it accurately. I'm afraid I couldn't draw it accurately. So the first transition --

MR. MCNEIL: That's actually -- I'm sorry to interrupt, but this might help everybody. I was just curious, is this a, a proprietary computer model or is it sort of a hand-drawn or hand-calculated model? You

know what I'm -- you know the distinction I'm drawing there? Do you understand the --

THE WITNESS: It's not proprietary. It's something that I've developed.

BY MR. MCNEIL:

Q Is it -- is it a computer model?

A Yes, yes.

Q Okay. So --

A It's a fairly sophisticated --

Q So this --

A -- and I do a lot of modeling.

Q -- is not a model that you've -- this is a model you developed, not a model that you purchased?

A Correct.

Q Or you have a license to?

A Correct.

Q This is your model.

A Correct.

Q But -- okay. So you used your model for this analysis in your 2016 report?

A That's correct.

Q And what I think you're saying is that your model was developed by you, at least in part based on the Roche and the Guo model; is that what you're saying?

A That's correct. So those are inputs to the model. Other inputs to the model are the geography, topography from the site. So the model is -- it's, it's, it's a -- it's a -- I, I guess we, we could call it a model. It's a -- it's a fairly sophisticated calculation.

Q Okay.

A And so just to answer your question, I don't know that first transition and second transition are a really great explanation, but what the researchers found was that there were three phases. So there's the initial phase where the fluid is behaving in one way; then there's the -- then there's the second phase where it's beginning to run out, it's beginning to level off. And then the third phase is where the, the fluid behind in the initial footprint is about the same height. It's approaching the same height as the fluid in the leading wave. And at that point, I turned off my model, so I've got the first two phases of what I include in my model after that second phase, I call that the end of the splash phase to align with the Guo model, which is -- that's where the Guo model picks up, on that third phase. And so then I'll switch into that.

Q So it's not -- it's not Guoy (phonetic),

it's Guo.
A I don't know, it's G-U-O, so --
Q Okay. Well, Mr. Helmlinger said Guo, so I'm going to --
A Let's go with Guo.
Q -- I'm going to stick with that. He probably knows.
(Simultaneous discussion.)
Q So the -- okay, so the inputs for the Guo model, and let me come back, perhaps, to the -- to your model, but are -- I, I, I know you kind of went through it with Mr. Helmlinger, but let me -- in other words, what I'm asking you is the Guo article that you cited has some calculations, and then it has the case study --
A Right.
Q -- and they're a little bit different, right?
A I think the case study is, is a good representation of the -- illustration of the calculations.
Q So that was my first question, so if we were using the case study as kind of the laundry list of inputs, what would be the key inputs in applying the Guo model in this case?

A So, so the initial splash radius is really -- is kind of a combination of, of geometric calculation as, as, as, as something that, say, starts out like a socialistic (phonetic), moves out and gets, gets -- the diameter, the circumference gets larger, that amount of material is just going to get spread out. And so there's, there's kind of just a really volumetric, geometric calculation that's part of the model, you know, how once something spreads out to that distance, what's the height -- change in height.
The second piece of it does involve viscosity measurements. And so that takes more into account the, the, you know, the sheer (phonetic) factors that are going to take place. There's an assumption that you're going to have kind of your -- on your -- the surface of your land, you're going to have one surface, and then you're going to start forming a skin on top, and so, so the model really is, is, is two planes, it's flow within two planes. It's flow within two planes modeling. Viscosity is really critical input to that. I don't know if that answers your question, but that's --
Q Well, no, no, that's fine as far as it goes, but are there any other key inputs in -- if we're using that case study as kind of the template?

A The other key input that I can -- well, two key inputs, slope and your fan angle, so is it 45 degrees; is it 100 degrees? Is it 180 degrees? What's your fan angle?
Q Yeah. And fan meaning the really directional flow?
A Correct. With the assumption that it is going to -- starting at, at the tank -- sorry, the center of the tank, and it's going to fan out in a -- in a uniform way.
Q Correct. What would be -- what would be a good shorthand for that? Would it be angle or -- I mean fan is fine if that's --
A Segment.
Q Pardon?
A Segment. And the Guo model uses, uses the term 'fan', I believe.
Q Okay. If there were a manmade depression, would that -- where would that get factored in? Would that get factored in as part of the slope? Or would it get factored in as part of volume?
A So the model is not great. That's one of the places where the model is -- does not work well in terms of taking into account changes in slope. So in order to take into account that type of situation,

what you can do is you can run the model in time steps. So rather than just looking at what would happen at the end of two hours, which is -- which is how the model is supplied in the paper, you can look at what would happen in the first 20 minutes and between 20 and 40, 40 and 60.
And you can look at those results, and based on -- and, and you can -- and I found this not, not in this situation but in other cases, you can look at changes in your slope, so if you were to have a depression, you know, your slope might be -- you might assume a constant slope down to that depression, and then if your depression, say your land levels off, and that's how a depression would work, and then it goes up a little bit, and then it goes down again, you could take that into account. That's the change in slope.
And so you would stop your model, your initial model with your slope assumption at that point. You would, you would run the next -- and that would be kind of your -- you would start again and say okay, now that's my new splash radius, and then you -- then you would run the model again for your next slope, cut it off when, when that slope changes again, run it again with the next slope. And you'd just

continue to do that to take into account variable slopes.

Q So you would reset it, as appropriate to reflect --

A Correct, correct.

Q -- topography, including depressions?

A Correct.

Q Let's actually look at the next page, Table 5, which is CX14 at 17. And you have an input here for slope. And it's expressed as 0.057 feet per feet; do you see that there?

A Yes, I do.

Q So when it -- in the notes, it refers to the channel embankment. Do you see that?

A Yes, I do.

Q Okay. So can you just clarify for me when this 0.057 is being referred to, what portion of the hypothetical release does that slope relate to?

A So there's -- there is -- there is a high point in the property near the -- my understanding near the, the property boundary, and then it slopes down from there to the -- to the channel. And so that's referring to that slope that is after that high point down to the -- to the channel.

Q And what about the slope between the tank

and the high point? Where does that appear in the model?

A In this here -- so, so the -- it's -- so the, the way I use the model is, is first of all, if the splash radius will get beyond that high point -- so the initial part of the model column will get beyond that high point, then it's met the condition that that then the, the, the amount of the asphalt that has gotten behind that high point will then transition to sheet flow, so I would only use this in that condition, if that condition is met.

Q And so I mean I see Table 5 says model material overtopping southern site boundary, but I guess what you're saying is that this Table 5 is -- would not reflect or if it does, please tell me because that's my question, the fade and transport, let's just say, to use a, you know, I think commonly understood term of the hypothetical spill from the tank to, in this case, the levy, the high point, right?

A Right, that would be covered in Table 4.

Q Table 4, okay. So you're -- okay. So you're treating -- in your report, you're treating the fade and transport of the spill from the tank to the levy that is the high point as part of the column

collapse analysis, correct?

A Yes, I determined that it would reach that point.

Q So going back to Table 4, can you help me ascertain where or how the topography of the site is included in these -- in the parameters?

A It's, it's not really represented in Table 4. As I recall, and this was a couple years ago, a few years ago, what I looked at is I looked at the fact that as the -- as the wave is advancing, you've got your top, you've got your top of wave, and so that's one of your models. That's one of the things you're modeling, but, but as I recall, I also looked at the fact that that -- at the bottom, kind of below a certain point, below a certain elevation, that the volume of material in that was not -- so if you look at the top of the berm and you draw a straight line back to the tank, it's a wedge.

So it's, it's -- so the berm, you know, you're, you're drawing a straight line because at the straight elevation if you were -- if you were to be at the top of the berm and you were just shooting an elevation across your tank, you would come up on not -- you know, there would be some slope upwards. And so that piece of the flow, the fan with the --

with the zero dimension at the top and some non-zero dimension at the top that forms what could be called a wedge. And so I calculate the volume of that wedge and make sure that I take that into account when I'm -- when I'm calculating the volume of the flow that's going beyond the, the tank.

Q Okay. And there is --

A There are some simple and sophisticated ways to do that.

Q Where -- so where is the volume shown in Table 4? Maybe we start with that.

A It's, it's not shown, but it's included in the calculation of volume of material beyond AST footprint.

Q Okay, I can't see that. That's third from the bottom, right?

A The second from the bottom.

Q Well, the second from the bottom, yes.

A Yeah.

Q Third from below the bottom?

A Yes.

Q Yes.

A And that's second.

Q So it -- based on what you've testified, am I correct in understanding that the end -- that for

this exercise, the end of the second transition aligns with the top of the slope before you reach the embankment?

A I believe I calculated that it goes slightly beyond that.

Q So you're -- okay. So for purposes of today, can we just assume those are in the same place? And that your second transition and the levy or the high point before it goes down, is that close enough?

A If -- I mean if you want to make that assumption to illustrate -- you know, to keep the conversation going, sure.

Q So you've got -- well, how far away is that? What is that, a couple feet or?

A Again, this, this, this is one calculation I did. It was -- I, I don't recall. It was a few feet, several feet. I --

Q Okay. Well, we can come back to that, but you've got 29,128 cubic feet of asphalt at that location, right? This is at the end of the second transition, which is approximately near the high point of the property to the south?

A That's what it says in the table. I would -- I would have to read my interpretation of that, but --

Q Okay. So just, just assuming that's the case, then 29,128 cubic feet, what does that translate to in gallons?

A If you multiply it by 7.4805, you could come up with that number.

Q I probably am not the most qualified, but I will try. You said times 7.4 --

A 805.

MR. MCNEIL: Okay. Your Honor, will you allow me to -- just 15 seconds to try to make that calculation? I get --

MR. HELMLINGER: 217,892?

JUDGE BIRO: That's what I get, 217,892.

MR. MCNEIL: 217,892. 217,892. Okay. We have a -- we seem to have a consensus. I didn't figure it, but I'm going to go with the majority. And so in other words, what this table means is that 217,892 or some, some amount close to that has, by your model, reaches the, the top of the southern -- the levy -- you, you know there's a levy there, there's a levy -- there's a high point at the southern end.

THE WITNESS: There's a high point.

BY MR. MCNEIL:

Q Yeah. Have you been to the property?

A I have not.

Q So how -- so you're familiar -- how are you familiar -- I don't mean this in an argumentative way, what did you review to familiarize yourself with the site topography, other than the one figure we had talked about earlier?

A The one figure is where I started to, to look at that, and then I looked at, again, you know, the Google Earth images.

Q That's not going to tell you the topography.

A No, it's not going to tell you topography. It's going to give you a sense -- a qualitative sense of the, the -- you know, the, the shape of the land. And so, so you marry that up with, with topographic contours, and then you can get a sense of, of topography. I just -- I do that as a matter of checking that there's, you know, not something there that -- you know, topography is, is an estimate of, of elevation, you know, between points. You, you go out there and you survey certain points, and you can draw topographic lines. And so I do that just to make sure that there's not something that is missing -- is not -- is not illustrated or not indicated by the topographic lines.

Q Well, it's a little bit more than that here,

right? Because the Guo model is a slope-dominant model, right?

A Yes, it is.

Q Okay. So topography is not an insignificant factor?

A Not at all, not at all. All I'm saying -- all I'm saying is I used the images -- used the images to, to develop it.

Q It needs to be accounted for.

A Absolutely.

Q So how did you account for the slope between the southern property line and the levy?

A So I had the top of the slope at the southern property line and the bottom of the slope or elevation at the -- you know, the, the place where -- at, at the top of the water or the water bank. And so those were the two points I used.

Q And what's that distance?

A I believe the distance is about 200 feet, maybe 220 feet, somewhere in that range.

Q So did you just assume a steady linear slope?

A I did, I did, yes.

Q And in other words, you assumed -- well, you calculated a slope based on an average linear but

constant --
A Correct.
JUDGE BIRO: Declination.
MR. MCNEIL: Sorry.
JUDGE BIRO: Right? A declination.
MR. MCNEIL: Yes.
THE WITNESS: A declination, very good. Yeah, that's, that's a good term. Okay.
BY MR. MCNEIL:
Q Go with that. Okay. Which may or may not be the actual slope?
A That's correct.
Q And then if we could go back for a moment to Table 5, I would like to ask you about volume again. This is, I think, in the first box, one, two, three, four, five, six, seventh item. And oh, sorry, actually, I meant to first ask you, if you could, I apologize to everybody, can we go back to Table 4? Looking again at the volume of that same one we were looking at. I meant to ask you about the initial phase, the 313,882 cubic feet number.
A Uh-huh.
Q If we did the math on that, would that be -- would that equal the tank volume in full, in other words 2.348 million gallons?

A It should.
Q And then where is -- where would the first tran -- you told us at least approximately where the second transition would be spatially. It would be at or near the top of the slope, leading down to the channel, right?
A Right, okay. Yes.
Q Where would the -- where would the spatial location of the end of the first transition be? The first transition, he has 172,635 cubic feet.
A Right. So that would be the leading edge, so 48 feet from the tank edge.
Q 48 feet to the south of the tank?
A Right, from the edge of the tank versus the southerly line of the tank.
Q Right, in other words, the southerly -- the southerly point of the tank -- of the tank exterior?
A Yes, and I believe -- and I, I -- that's why I'm hesitating a little bit, I believe that this is a 360-degree model, so it would be 48 feet from the tank edge in all directions, but I, I would have to verify it.
Q So does the difference between the cubic feet expressed in -- I'm still in the same row, which is volume material above AST footprint, are you with

me?
A Yes, I am.
Q So looking at the column, initial and looking at the column, first transition, is the difference between those two figures -- does it take into account any of the topographic features within the tank wall or the tank containment wall?
A Those figures are, are figures related to the volume of material, so -- right, so if you look at the volume of material above AST footprint, volume of material beyond AST footprint, if you add those two lines across, so 313,882 plus zero is 313,882. The next -- in the first transition, 172,635, plus 141,247 should equal 313,882. So that, that, that's just a volumetric calculation, what's above the tank, what's beyond the tank.
The, the topographic information, the depression -- so you've got a height. The height is -- the height of the fluid is really determined by the, the fluid behind -- by the fluid over the footprint. That's what's really kind of driving the height of your footprint. The base of your, your fluid is, is what -- is where we take into account topography. So now if I -- if I draw my 360-degree circle and I move out 48 feet or rather, it's

iterative, so if I draw my circle, and then I say after a certain amount of time where we go into our next transition, how much material will have moved beyond the, the, the footprint.
Based on that number, I, I would then take into account, I've got, you know, my height, and so I would take into account topography to give me my base. And then that would give me my, my volume of material beyond the footprint. That would give me my volume -- that would be the shape of the -- of the -- of the volumetric surface or the volumetric -- the configuration of, of this -- it's hard to explain.
So that would give me my shape beyond my footprint, and so then I would say, okay, I know how much volume is beyond that footprint, but how does that volume fit within that shape? And once I answer that question, that tells me what my distance is. That tells us -- so as I move away from my tank, the volume that can be contained in that area changes. And when I get to the place where the volume I calculate from my distance to my topography with that volume is the same as the volume I've calculated beyond my footprint, then I -- then I stop and I say that's the edge of the -- of the flow at this point.
So topography is, is taking into account

explicitly, in terms of my geometry, you know, my geometric calculation. I wish I could explain it better, but --

Q Is it -- is it variable across the 48 feet or is it constant across the 48 feet?

A I would have to look at how I made my assumptions here. In some cases, it's, it's completely variable. I'll look at changes in slope from Point A to Point B and take that into account in my calculations.

Q What is the -- so in this -- this is part of your model that we're talking about now, right?

A That's correct.

Q Okay. So what do you -- what do you label the input here that you -- that you've designed? Does it have the same label as the column we're looking at, volume of material? Or how do you -- how do you enter it? How do you calculate it and enter it in your model?

A So the model includes geometric components like the raise of the tank, the height of the initial fluid, the topographic contours, so I would -- I would say as I -- as I said, as I move away from the tank, if, if you initially are sloping down, which I believe is the case here, then I would -- I would say where

does that slope change, and I would call this Point 1, Point 2, and then where does -- you know, after, after that, where does it change again? Point 3. Then is there a lip that'll be Point 3A & B, you know, 3 -- you know, gutter and 3 outside topography, whatever it would be.

And then I'll, I'll just continue to make those points, and that creates my geometry. That creates my, my geometric model. So those are some of the inputs. Other inputs are viscosity. Actually, viscosity is not, not actually a major input in this model. The other inputs would be, you know, the height, as, as I mentioned.

Q Is that -- is that because you're assuming this initial splash moves the release -- the release of the contents a certain distance? Is that why viscosity is minimized in this particular calculation?

A That's right, because then -- and, and for this initial phase, which again, is like the first 20 -- you know, 15, 20, 30 seconds, the dominant forces of gravity and momentum, which can be affected by topography, which can be -- but those are -- those are the things that are dominating, and once you get out to a place after this initial splash, viscosity starts to take over as one of those forces that dominate

flow.

Q Sure. So I, I guess would it -- I'm just -- I'm trying to -- so I think I asked you whether it was variable or constant across the initial -- the first transition, and your answer was?

A I believe, in this case, I assumed it was constant for simplicity. And in other cases where this is more of a determinative factor in my conclusions, I'll, I'll make more precise assumptions.

Q So that -- your decision, I believe you said, was dictated, in part, by your understanding or your opinion that the viscosity of this material would be less impactful in the initial phase; is that right?

A I don't -- I don't think that's what I said.

Q Okay. Maybe I misunderstood. So you were talking about the initial splash and the volume and the wave and so forth. And I'm just trying to understand how you -- how you actually input that into your model and then what your model outputs were for this distance between the initial and the first transition.

A Right. So the -- so the impacts are, as I mentioned, the geometric kind of pieces of it, how the volume changes as one moves away from the tank. So that, that's geometric. The other input is really

the, the dimensionless shape, height and distance, values that come out of that Roche model that we mentioned earlier.

Q Flipping back to Table 5, for the fan, you explain here in the notes, "Model one degree slice." What does that mean?

A So again, if -- given the complexity of the topography and contours and, you know, other barriers, different, different parts of that fan, once it's after the initial -- after the initial splash, different parts of that fan are going to move differently. So for example, towards the north, towards the catch basin, which I also modeled, you're going to have different slope. And so rather than -- the -- as I -- as I mentioned, the Guo model assumes a constant slope, but I know that as I go around the circle of my fan, that the slope, at this point, is different than the slope at this point, is different than the slope at this point. So what I do in order to, to evaluate how different points along that fan are going to move is I just look at one degree -- a one-degree slice.

And I model that slice and then I can model this slice separately and this slice separately. And, and I know where my initial volume is and I -- and I

know how that is going to fan out. Given the fact that that is all fanning out, you're not going to have really strong interactions kind of between those slices, and so you can just model a single slice to come up with your answer about, you know, how this is going to move out.

And at the end, you're not going to have a nice circle. You're going to have a -- you know, a, a funny shape. And by doing it slice-by-slice, you'd be able to actually define what that shape would look like.

Q And the funny shape you just mentioned, is that something that at the -- when you're done with running your model, you could actually print out visually or is it just a series of numbers or what --

A Yeah, I --

Q -- what's the funny shape?

A Yeah, I could do that. Typically, what I'll do is I'll just look at, at those directions that really matter to the answer. And so in this case, I looked, you know, in the direction of the ship channel, and I looked in the direction of the catch basin. Those were the two slices or what I -- what I call it here, those -- you know, those were the, I think, slices, yeah, 100-degree slice. Those are the

two slices I looked at. There were other cases where I'm trying to evaluate whether something will, will overtop, you know, if there are -- if there are multiple changes in topography, I'll look at a number of different slices, just to evaluate how something could be released beyond a, a topographic barrier. Although, I've never -- I've never run the full thing to come up with what the shape would look like, it's, it's interesting -- it would be interesting, but it's not, you know, what, what I'm paid to do, so --

Q Okay. And what's the -- what's the name of your model?

A I don't -- I haven't named it, it's not a published model. I, I refer to it in my head, I guess, when people ask me about it as the column collapse model.

Q Does it have any sort of intellectual property protection that you've applied for?

A I have not, no.

Q Does anybody else have it, besides you?

A I don't -- so I may have -- I may have shared the basic model with EPA. I'm not -- I'm not sure. Certainly, it's available to EPA if, if they would like to see it. It's, it's their property.

Q They paid for it.

A Correct.

Q When was the model developed, what year?

A I, I think my initial version of the model was probably in 2016. I, I've modified it since then in, in different ways. And, you know, we, we call it a model. It's, it's a -- it's a -- it's a calculation. It's a methodology. It's a calculation approach. It's, it's using fairly, you know, standard type information. It's geometry. It's just put together in a way that'll do efficient calculations based on geometry.

Q Does it -- does it only have a usefulness in FRP applicability?

A I'm sure it could be used in other ways, but I've only used it for this application, yes.

Q And if it was developed in 2016, that's also the year that you prepared the report, was this report part of the research and development of the model?

A Yes, yeah.

Q And since then, what other projects have you used it on?

A I have used it on another FRP applicability evaluation, again, with an asphalt application. I'm not sure that I needed to use it for the other two, given the, the, you know, specific circumstances of

those evaluations.

Q What was that other site that you used it on?

A I don't know if I'm --

Q Why don't you just tell us the state it's in, if there's no objections?

MR. HELMLINGER: I'm sorry, I missed the statement.

MR. MCNEIL: He's hesitant to identify the client, so I said why doesn't he just tell us the state that it was -- that the property's in that he worked this up for.

MR. HELMLINGER: I'm not sure of the relevance of it. I think that there has been a lot of discussion about this model and that this question is -- I think the model is a mischaracterization. I think the testimony in the record is going to be clear enough, but if it's --

JUDGE BIRO: Do you object to the disclosure of the location by state of the other asphalt plant?

MR. HELMLINGER: It won't do any harm. No, I don't object.

JUDGE BIRO: Okay.

THE WITNESS: I'm sorry, I, I actually can't recall the state.

BY MR. MCNEIL:
Q Okay. That's all right. Was it -- was it also an EPA-funded project?
A Yes, it was.
Q It was a contract that you -- your firm had with the EPA to do that work?
A Yes.
Q And you did that work?
A Yes.
Q Is it completed?
A Yes.
Q All right. Turning back to Table 4, under the third line, "Estimated Values, Advancing Fluid Height," can you share with us what that refers to?
A So there's the fluid height above the original footprint of your -- of your container or your dam or whatever, and then there's the fluid height that is moving beyond. And so as I mentioned, the shape looks like, you know, above your footprint, it looks like this, and then moving beyond, it looks like that. And so that would be the height of the fluid moving beyond.
Q If you wanted to explain to everybody here assembled how you took into account in running this model for this assignment, the depression, the

topographical depression around 2000 -- Tank 2001, how could you -- how could you explain that to us?
A Could -- could I draw it? Okay. Then that's the best way to do it. Is there a --
JUDGE BIRO: Here, you can have my pen.
THE WITNESS: So this, this is not to scale, I apologize. So, so here's the center line of your tank. Say your topography looks like this --
JUDGE BIRO: You can't use words like 'looks like this'. You have to mark it as Line A.
THE WITNESS: Okay. So this rectangle here we'll call the tank. This line going down through the center is the -- I'm going to label it CL, the center line of the tank. This is the base of the tank. So this is -- this is the -- this is the land. I'm trying to represent here the land. So I have a, a line sloping down away from the tank, indicating that the land is sloping away from the base of the tank or some distance, and I'll call this distance X1.
And then this indicates here that the land is now sloping up, so the line moving up to the right I'll call -- to some point, we'll call X2, and then here, I've got a third line, I'm just going to label it X3 so we have like Line 1, 2 and 3. The third line is just a, a straight line across.

And so --
MR. MCNEIL: Mr. Michaud, I just -- I apologize for interrupting, but X1 is very difficult to see. I think the pen didn't really have ink, so --
THE WITNESS: Okay.
MR. MCNEIL: Thank you.
THE WITNESS: So we -- in, in the model, we have our initial -- this is our -- this is the height, I'll call it HI, height at the initial point, and so the, the height beyond what I would call advancing fluid height, here is -- so I'll call that A, AI. The advancing fluid height, when everything is in here is, is here. So now, take away this wall, so I'm taking away the, the right-hand line of the tank. This is going to change over time. So after the first say few seconds, my height here is going to look like this, and then there's going to be some dropoff and my height beyond is going to look like this.
JUDGE BIRO: When you say this, mark that line as B or something.
THE WITNESS: So this is HF for H first transition. I'm going to call that F, F. F first transition over the footprint. And this here, this height here is my H height A, advancing F, first transition. And so this height, HAF then is related

to this height HFF, based on the -- on the dimension list parameters that come out of the Roche model. They say that after a certain amount of time, those two H above the footprint and H advancing, HA -- F and HA, there's a relationship with that, those two. And that's going to change over time. And so I can input that into my model and say, okay, after, after one minute, what's that's going to look like? After two minutes, after one second, after 20 seconds?
And I have that ratio. So I know what this is going to be because I know that that -- well, actually, what I do is I say, okay, after 10 percent of the volume, is, has moved beyond, what is this going to look like? What's, you know -- now I know once I -- once I remove 10 percent from here, I can calculate my height above my footprint. That's just a simple volumetric calculation. And so I can calculate my fluid beyond, that's, that's everything that has now emptied out of that.
Then -- and I know my -- I know this height, the HAF, so if I -- if I know the height of my land and I know the height of, of my -- of this point here, of HAF, for simplification, I've got now this, this geometric shape here, which, which is bounded on the bottom by the shape of the land; it's bounded on the

top by the height of my advancing fluid. It's bounded on the left by my tank edge. And here because the land is sloping up, it's, it's -- it has no -- it has no vertical endpoint.

So this is what I was referring to before as roughly like a wedge going beyond. If I know -- if I know this height at the top of my wedge and I know this height at the bottom of my wedge, I could calculate -- and I know my volume, I can calculate how much -- how far -- I can calculate how far it's going to go. I can calculate whether it's going to go this far, say X1-2, that's the transition between one and two, or I can calculate whether it's only going to go this far, that's -- it's a volumetric calculation.

And on the volume, I have my -- I have my shape, and I know that as I move away from that tank, that shape is going to change, and I can calculate how that volume is going to fill up that shape.

BY MR. MCNEIL:

Q So in your example, sorry to interrupt, but in your example, let's just use your example of the 10 percent because I can probably do that math. So you're assuming the tank is full, so it's got 2.348 million gallons. Okay. So let's take 234,000 gallons off of that. So that amount is going to travel how

far?

A That will -- so, so I'll look at either say a one-degree wedge or whatever my, my fan distance is. Depending on my scenario, if it's -- if it's a -- say a 45-degree directional flow, I can -- I can -- I can calculate how that, that 23,000 --

Q 230,000, yeah.

A -- 230,000 gallons are going to fit in this -- in this shape, in this -- in this -- that wedging shape that has this changing bottom and a constant top. I can -- I can calculate how it's going to fit into that -- into that wedge. The, the variable that I can't -- I don't know is how far it's -- how, how far to move in this direction, so I can move from -- I can calculate it here, and maybe that comes out to be 140,000 gallons. I can calculate it here or, you know, I'm moving my hands to the right to indicate that I'm moving further away from the tank.

So I can calculate it here, maybe that's 140 or calculate it here, maybe that's 200, and then I move it a little bit more, and that comes out to 230,000 gallons. And I say, okay, I can fit 230,000 gallons into this shape. And so wherever my hand stopped, that's my leading edge. That's how I determine my leading edge. And then I'll take another

10 percent off. Then I'll move that volume into here. Then that, that will give me a new leading edge. In every one of these calculations, I am taking into account the shape of the topography because that's, that's part of my volume. That's part of my shape. That, that -- and this is also -- and maybe in some cases, it's going up because, because my -- the volume of, you know -- because maybe I have a slope going up.

And so this, this will -- this will change -- this is going up because more material is coming out. And, and so you have to take into account all of those things, but your shape is changing. You -- but in a -- in a way that you can model.

Q And just to back up to something you said earlier, at this point, viscosity is not being -- is not part of the input, at this point -- at this point of the equation?

A That's correct, because this, this is all taking place within maybe a minute or two minutes. And at that point, you're, you're changing what this -- well, I mean one point I, I would like to make is your viscosity is not going to change from, from during this period. That's the first part. And then I do take into account the variable viscosity during the run-out phase. But the other thing is as the

model --

Q Viscosity won't change --

(Simultaneous discussion.)

A It'll change, but --

Q -- but the cooling effect of the ambient temperature will have an impact on this release, right?

A Very little. At this -- in the first minute, two minutes after a release, it is going to be dominated by the difference in hydrostatic pressure between, between this, HF, your footprint and H and your -- and your advancing footprint. You've got a lot of weight behind your advancing footprint, and that is going to be pushing down because of gravity, and then it's going to be pushing out and creating momentum in this direction as it moves out this way. That's the way the forces are going to move in.

Now, and the research that I've relied on and, and I, I cited the Roche paper; there are other papers as well, demonstrate that just during this initial phase, gravity and momentum are really the dominant forces. Those, those are much more dominant forces than the two molecular forces.

Q Can you -- can you help me understand the -- did the Roche study involve an earthen dam or a dam

break that had water in it?
A I believe what they did -- it was a -- it was a laboratory model, and so what they did is they had a, a plate in front of a reservoir with, with material in it. And they lifted the plate quickly and they, they modeled -- so it was -- it was a model so that they can capture the cross-section. Because really what they were interested in --
Q So the models of that was assuming water behind the dam?
A No, that's incorrect. It was -- it had a -- they modeled -- and again, my best -- to the best of my recollection, there was -- there was a granular material that had been -- where air had been forced into it to remove the friction, the friction that was used to model intermolecular forces. There was a material where that initial condition did not occur, same, same material. And then they also used water.
And they, they looked at how those three different materials behaved. So the materials that I was using are, are the granular material that had been fluidized, which is a way of modeling the, the counter -- counteraction -- counteracting the intermolecular forces, viscosity.
Q If you had to -- if you had to estimate a

margin of error for the model you developed, what, what would be the range of margin of error that you would estimate? What, what would be your best estimate?
A I --
Q 10 percent? 25 percent?
A I, I -- for, for that kind of analysis, I, I would like to have the various parameters and, and, and give you a -- typically, when I -- when I do some kind of uncertainty analysis or margin of error analysis, I always like to do that quantitatively and not, not just guess at it.
Q Okay. But there would be some variability between actual site conditions and what you modeled, right?
A Yes, the model -- a model is a model. It's a representation of, of the real world.
Q And it depends on the inputs, of course, and --
A Correct. And it can -- it can go either way. It can -- it can underestimate. It can over-estimate. To put an amount on that, just off the top of my head, I don't feel comfortable with that. Although, I will say that given the -- putting everything together is complicated, but, but the basic

math is, is not that complicated. It's really -- it's, it's geometry. So I, I have -- I have a good deal of confidence. The places where, where I don't have confidence is that there is -- there is -- the places that would add some error is that that land is not -- you know, the contours of the land are, are variable and they're -- you have to make simplifying assumptions in order to run the model.
Q If you look for a moment at your Table 6 on the third line in the first bracket, that's slope. I think we looked at that earlier. Do you see that? This is the 0.008 feet, per feet. And in your notes -- do you see that?
A Yes, I do.
Q And in your notes, you have a reference to the consolidated plan, Figure 7. And if I represented to you that, that Figure 7 show contours of 99 -- an elevation of 99 to an elevation of 102, and I asked you if that was one of the inputs in your model, what would your answer be?
A Yes, but that's not what's reflected in this table.
Q Okay. What is reflected in it?
A This, this is the table that, that looks at that wedge from the tank to the catch basin.

Q Oh, okay. So -- okay, so you're saying we would have to look at Table 4?
A Table 4 is where that would come into, into play and it's, it's not transparent in the table.
Q Where can you see it as a table?
A It's, it's -- as I said, it's not transparent in the table. It's included in the model, but --
Q What, what on the table shows where it's not included?
A The -- as I illustrated here, the distance beyond the edge of the tank is, in part, determined by that, that input because that, that defines your shape, that defines your, your volumetric shape.
Q Okay. Let me ask you while you've got CX14 before you to look at the last page, Page 20 of 20. And this is your Figure 2. Do you see that, Elevation View of C as in Collapse Scenario?
A Yes, yes.
Q For AST No. 2001?
A Yes.
Q This is -- is this something that the model generated or is this something that you drew by hand?
A This is just hand-drawn.
Q Did you perform it?

A Did I --
Q Did you -- did you draw it?
A Yes, I did.
Q This shows, as it says, an elevation, so at the left side of the figure is the channel and the right side would be the -- one of the catch basins that are on site that are at the northern -- on the northern side of the tank, right?
A Correct.
Q So the left side is south, and the right side is north on this page.
A Correct, correct.
Q Okay.
A Yes.
Q Does this elevation reflect the man-made depression around the -- this tank, 2001?
A No, so this is really just a simplified illustration to explain the text. But no, it does not show that.
Q And does it show the survey contours that I mentioned a moment ago, 99 feet and 102 feet?
A No, this is not intended to be a scale drawing.
Q Does it show the levy?
A It shows a high point, after which the land

slopes down to the ship channel. I don't know if that's called a levy or not. I, I mean I deal with levies.
Q Does it show the K rails that are at the southern end that run along parallel to the southern end of the tank enclosure?
A As far as I understand that, there are K rails there, but no it does not show that.
Q Okay. You read they are there.
A Yeah, I've read, read that.
Q But you didn't depict them here?
A No, I did not.
Q And did you include them in your inputs?
A No, I did not.
MR. MCNEIL: I don't think I have anything further right now, Your Honor.
JUDGE BIRO: Okay. It's 11:54. Would you like to proceed? It's 11:54. Would you like to proceed now or do you want a break?
MR. HELMLINGER: I'm happy to proceed now. It might take about a half-hour. There's a lot of complicated discussion there, so I'll leave it to your discretion if you want to --
JUDGE BIRO: No, we'll take a late lunch. Let's go.

Mr. Michaud, do you have water? Are you okay? Do you need a break?
THE WITNESS: I could use a quick break.
JUDGE BIRO: Okay.
MR. HELMLINGER: Five minutes.
JUDGE BIRO: Let's stand in recess for 10 minutes. Go ahead.
(Whereupon, a brief recess was taken.)
JUDGE BIRO: Let's proceed.
MR. HELMLINGER: As a preliminary matter, there was discussion of the hand-drawn illustration on the easel board.
JUDGE BIRO: Right, we --
MR. HELMLINGER: Would Your Honor have objection if we found the need to make that part of the record or is that --
JUDGE BIRO: No, that's fine. We should mark it for identification, at the very least.
MR. HELMLINGER: Sure.
JUDGE BIRO: As --
MR. HELMLINGER: I think 105 we're up to, maybe.
JUDGE BIRO: Respondent's Exhibit 105, that's fine. And the original copy would stay with the record, whether it's admitted or not, but if you

want to make it -- if you want to have a copy of it for your own purposes, I would think you could photograph it.
(The document referred to was marked for identification as Respondent's Exhibit No. 105.)
MR. HELMLINGER: Sure. That would be easy.
JUDGE BIRO: That would be the easiest method.
MR. HELMLINGER: Right.
JUDGE BIRO: Otherwise, you'd have to find a place to physically copy it.
MR. HELMLINGER: Sure, no, I'm not sure that we need our own copy with any specificity. Maybe that comes up, not likely. I think just for referencing for the rest of this examination.
JUDGE BIRO: Okay. Do you want to admit it into the record as an exhibit?
MR. HELMLINGER: Sure, we'll go ahead and do that.
MR. MCNEIL: I don't object.
JUDGE BIRO: Okay. So Respondent's Exhibit 105 is admitted into the record.
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(The document referred to, previously identified as Respondent's Exhibit No. 105, was received in evidence.)

REDIRECT EXAMINATION

BY MR. HELMLINGER:

Q Mr. Michaud, we heard testimony both yesterday and today about this half-mile concept and you have adopted an understanding of that. Could you tell us whether that would've spared us from all of that math we just did over the last 45 minutes?

A Yes.

Q And how so?

A So in, in determining the FRP applicability and doing my evaluation, rather -- so the first thing I -- after secondary containment, when I was looking at the location of the facility relative to Fish & Wildlife and sensitive environment, I went to Attachment C3 of Appendix C, and I think we talked about that yesterday. And as you go through that attachment there, there are sections that deal with how to calculate D3, and then there's Section 5, which deals with how to calculate the overland flow. So under Section 5, Paragraph 5.5, in that appendix states that, "If the nearest opportunity for discharge

is within a half mile of a navigable water, that you must calculate D3. That's the D3 distance and so --

Q Right. And we don't need to rehash sort of all of the calculations there, I think that --

A Sure.

Q -- for my purposes now, that's sufficient. But is there more points that you'd like to add, though, to well answer that question?

A It was -- it's pretty clear to me that if, you know, once I determined that it was within a half a mile of the Sacramento Deep Water Ship Channel, that was the end of my calculation --

Q Sure.

A -- for the purposes of determining applicability.

Q From your experience with the oil pollution prevention regulations and calculating facility response plan applicability analysis, are you familiar with the concept of a worst case discharge?

A Yes.

Q Could you describe what you understand that to be?

A I, I prefer to look at the definition. I'm, I'm not sure I can tell you off the top of my head.

Q So I propose to you that it is defined in

the regulations as 40 CFR, Part 112.2. I'll read this and let me know if it sounds correct to you, to your understanding. "Worst case discharge for an onshore non-transportation related facility means the largest foreseeable discharge in adverse weather conditions, as determined using the worksheet in Appendix D to this part." Does that sound correct to you?

A That does, yes.

Q I'd like to ask you about the word 'foreseeable'. There was a lot of discussion previously with Mr. McNeil about reasonable expectations of discharge. Is it foreseeable to you that a tank may have design defects, as an engineer, foreseeable to you?

A Yes.

Q Is it foreseeable to you, as an engineer, that an earthquake may occur in California?

A Yes.

Q Is a total tank collapse foreseeable under circumstances that, to you as a professional engineer, seem reasonable?

A Yes.

Q The -- given your experience with calculating facility response plan application contemplation, could you describe how the process or

formula contemplates the presence of secondary containment?

A So in the overland flow calculation, secondary -- you cannot consider secondary containment in your -- in the flow model.

Q But it does allow you to consider manmade depressions, do you understand that?

A That -- yes, that's correct.

Q Is manmade depression defined, to your understanding?

A I don't know if it's defined in the regulations, but I have a very clear concept of what that means, yes.

Q I'd like you to turn, if you would to CX17. I think it's Page 22.

A Okay.

Q Is this the topographic map that was given some discussion a few minutes ago, topographic survey I think it was described as?

A This is a topographic map that I've, I've considered. I don't know if this is the only one.

Q But you're familiar with the topographic surveys and how to read them; is that right?

A Yes, yes.

Q In your professional experience, it's a

reasonably common thing?
A Yes.
Q So representing that this is an illustration of the VSS Facility in West Sacramento, there are two large grey circles here, and I'll represent to you that those are the two large asphalt tanks that we've been discussing. Can you accept that?
A I can accept that.
Q Do you see the blue topographic line that really cuts almost right under the middle of the tank to the right of the illustration? I guess that would be east as -- northeast as oriented on the map, as noted up above. Do you see that blue topographic line?
A I do.
Q And can you follow that back -- and it may be hard to read, but can you read the topographic designation on that line?
A 100.5.
Q I think with my tired eyes, that's what it says, too. So if you read to the south, as this map is generally facing, above on the page, the next topographic line out, almost to the black line that I'd represent to you is the secondary containment wall at the facility, do you see that line?

A Yes.
Q It sort of runs right under where it says asphalt plant area.
A Yes, I do.
Q Could you read the topographic demarcation on that line?
A 101.0, 101.0.
Q So moving from north to south, in between those topographic lines, what does that represent to you?
A It means that the land is sloping up.
Q Given the scale of the map, is this consistent with the slope that you used in your table at CX14?
A Yes, this is what I took into account.
Q And if I could show you, moving north across the illustration, I'm going to call the top north, even though it's really sort of a northwesterly, I think it's easier to conceptualize. You can see the cardinal of the map is just slightly off angle, but if we moved straight up north on the map, the next blue line behind the tank on the right, do you see that blue line? It moves and bisects then a much smaller tank outside the secondary containment in this illustration? Am I sort of clear trying to articulate

which line I'm talking about?
A Yes, I do. Yes.
Q And it looks like there's a confluence of lines, several that come together, almost -- well, virtually creating the drainage. And you see where those lines come together, can you read the topographic demarcation of that line that sort of creates that low point?
A Yes, it looks like 100.0.
Q And do you see anywhere to the bottom of that more southerly, any demarcation suggesting 99 feet?
A Yes, I do.
Q And where is that?
A So -- well, I see it to the north. The, the -- kind of the north corner, the upper right corner of the area around those two circles, there's, there's a topographic line that closes on itself.
Q Sure.
A That says 99.5.
Q And it creates a depression to the north of these tanks. But between these tanks in the Sacramento Deep Water Ship Channel, as you understand this map to lay out, does it -- is there anywhere lower between those tanks and the southern part

demarcated as less than 125 feet?
A No.
Q So if we look to your hand-drawn illustration previously, what's marked as RX105, you have that low point of X1, that would be only hypothetical as applied to if you're reviewing the facility from the south on the side angle. From this topographic map, is there any depression between the tank that goes down as you have that kind of low point of your bottom wedge, I think was the phrase you used?
A Based on this topo?
Q Yes.
A No, no there is not. I do recall that there's another topographic map out there with finer topographic delineations.
Q Does it create a significant depression?
A No.
Q So we heard the phrase 'manmade depression' several times. Do you see any engineered structures, facilities or anything that create a significant depression in this topographic map on Page 22 of CX17, south of the tanks?
A Nothing that I would call significant.
Q Might it be fair to rather than use the phrase manmade depression over and over, just simply

call it slope?
A There are changes in slope, yes.
Q There's a lot of discussion about models previously, change the topic a little bit. So you testified that you applied the Guo model and the Roche model; is that correct?
A That's correct.
Q And there was discussion of something else you had as a model, the -- this column collapse model as we were discussing it. Does it include any mathematic methodology of your own creation?
A No, I wouldn't -- I would -- I would say that I put together some fairly standard math in, in maybe a complicated way, but --
Q How would you respond were I to suggest that your column collapse model is really just a digestion of the Roche and Guo models in a macro format, much like one might take several routine complications that you don't want to do over and over and over and create a system of doing them rapidly and efficiently?
MR. MCNEIL: Objection, Your Honor. That's a leading question. It's improper.
JUDGE BIRO: Sustained, sustained.
BY MR. HELMLINGER:
Q You discussed that your model considers the

Roche model, and your model considers the Guo model, are there any other models or factors included in your column collapse model?
A The only other factors are really the, the topographic -- the specific contours of, of the sun.
Q How would you describe this column collapse model to peers of yours who may be familiar with Roche and Guo?
A I would say that the -- well, really it, it encapsulates, it, it's really using the shape parameters from the Roche model kind of, of -- and, and there are different shaped perimeters, and so you can -- you can kind of find what applies based on your -- on the specific configuration of, of the tank in terms of height versus diameter. So it applies to those parameters. It, it runs volumetric calculations that would be difficult. It would be very time-consuming to do by hand. And so it's a -- it's an Excel spreadsheet that does these calculations.
It allows me to iterate. It allows me to put in the value, starting value, see where I come out. Put in another value until my volumetric calculations line up.
Q Are you familiar with the concept of a macro routine in computing your calculations?

A Yes, I've written many macro routines.
Q And how would you compare your column collapse model to a macro routine?
A So the macros that I've written are more, you know, basic -- basic macros using code. This is using the basic code in, in the Excel platform. I'm not sure if that answers your question.
Q Well, you --
A I could do it by macro, or I could do it using just the Excel, either way.
Q That's fair enough. I'll move on. K rails on the perimeter of the facility, are you familiar with the concept of K rail?
A Yes.
Q Or Jersey walls, some people might call them.
A That's, that's the term I would typically use.
Q Do you generally in your professional experience understand them to be water-tight?
A No.
Q Do you intend them to be designed to contain oil?
A Not in my experience. I have never used them for that purpose or designed them.

Q If I could turn you to, let's see, I think it's -- what was it CX -- I had the wrong number written down, sorry, CX9. I think I'm being a little dyslexic in my haste, I had CXP, doesn't do me any good.
A Okay.
Q Okay. I'd have you turn to Page 4 of CX9. Do you see that? At the bottom of the page, there is an illustration that begins, "Photo Description: Overview of the Southeast Perimeter." Do you see that?
A Yes, I do.
Q Do you see in the bottom portion of that picture, a structure of any sort?
A Yes, it looks like at the bottom of the picture, there, are there two, you can see kind of the brown and white lines underneath which there's grey and those, those two structures appear to be tops of K rails or Jersey barriers.
Q And do you see any higher elevation from that view out toward the Sacramento Deep Water Ship Channel, any levy or berm or any of those concepts?
A I don't see anything there I would describe as a levy or a berm.
MR. HELMLINGER: No further questions.

JUDGE BIRO: Any recross?
MR. MCNEIL: No recross, Your Honor.
JUDGE BIRO: Bear with me just for a moment.
MR. MCNEIL: Absolutely.
MR. HELMLINGER: And Your Honor, we would like to not release Mr. Michaud as yet. We may need to call him as a rebuttal witness after the experts for the Respondent testify.
JUDGE BIRO: Okay.
MR. HELMLINGER: Thank you.
JUDGE BIRO: I just wanted to clarify a few comments you made. When you were talking about the worst case scenario issue, does that apply to determining whether there is sufficient containment at the facility?
THE WITNESS: Yes, so for the secondary containment calculation, which is more a volumetric calculation, so first, first I would calculate the capacity of that structure to store the capacity of the largest tank. So that's, that's, in some ways, the worst case scenario that you, you've released the oil from the largest tank and it was at capacity at the time.
The other piece of the scenario is that you take into account the fact that rainfall now could

also fall within that structure. And so you take into account the -- it's generally accepted, the 24-hour -- 25-year, 24-hour storm, so a storm that -- a 24-hour storm that happens once every 25 years is the way to think about it. That's the frequency.
JUDGE BIRO: Do you take into account whether the material, in this case, asphalitic cement, would expand or contract based on the temperature?
THE WITNESS: I haven't taken that into account in my calculations. That's a good question.
JUDGE BIRO: Would it be affected by the ambient temperature? If, for example, we are in California, and it was, by bad coincidence, 120 degrees outside, would that affect the containment?
THE WITNESS: I don't know how that would affect it in terms of the height or the volume that would need to be fitted in there. I think that if there was rainfall at the same time, there would be some counteraction within those factors.
JUDGE BIRO: How about if it had been 120 degrees for a number of days and what the asphalitic cement was falling on was very hot itself, the ground and the barriers?
THE WITNESS: Well, I think for asphalt cement, the starting point is that that cement was

already heated up to, you know, 250, 260 degrees. So that the tank needs to be able to contain that volume at that heated level. So I would think that if anything after the asphalt had been released, it would probably cool because, because it's subject to, to less tension.
JUDGE BIRO: But the rate at which it would cool would be slower if the temperature of both the ambient air and the ground were warmer than --
THE WITNESS: That's correct.
JUDGE BIRO: -- right, 100 -- let's say it was 100 degrees on the ground and in the air versus 50 degrees on the ground and the temperature of the cement or whatever is around it.
THE WITNESS: Absolutely, yes.
JUDGE BIRO: You had talked a little bit about your example of the molasses and such, you were talking about density in that case, right, of the molasses and the -- not viscosity?
THE WITNESS: I was talking about the viscosity.
JUDGE BIRO: Okay. So how do you define viscosity?
THE WITNESS: It, it has to do with the shearing of, of, of the material.

JUDGE BIRO: You said stickiness, so if that -- is that its tendency not to flow? Is that what -- how you would define it?
THE WITNESS: Yes, so in, in a chemical mixture, which asphalt is, you've got -- well, any, any kind of chemical compound, you've got -- you've got molecular forces, like H20 and they're keeping that molecule together. But then you've also got -- in certain types of substances, you've got intermolecular forces. So in the case of asphalt, there are certain compounds in the asphalt, asphaltenes and aromatic compounds and some hetero compounds that have other types of non-hydrocarbon atoms, and those all create forces like that you've got positive and negative charges and, and they pull on each other.
You've also got asphaltenes are very kind of rigid structures. And so you have these, these forces that as, as fluid flows, so fluid doesn't all move together, but they're always -- you know, there are always interactions between molecules and the fluid as it flows. And so in a viscous fluid, you have those intermolecular forces instead of just allowing something to flow right past another molecule, they'll, they'll kind of grab onto each other.

And that, that -- those forces are keeping it from just flowing like you would think water would flow. And so, so it's fighting against that -- you know, the gravity that would just allow it to flow down the hill. So, so, you know, you've got in asphalt that happens, it also happens in other fluids, like, like in honey and molasses.

JUDGE BIRO: Okay. So is there a -- there are density numbers. That density number for water is 1,000 --

THE WITNESS: Uh-huh.

JUDGE BIRO: -- and I think molasses is like 1.4, you know, 1,400 or something. Is there a density number for asphalitic cement?

THE WITNESS: There is. There are many different grades of asphalt, so different, different asphalic cements will have different densities. I can't tell you off the top of my head the grading range I use, but actually, I do use asphalt density in my calculations in overland flow. Federal Highway Administration has, has a way of modeling the change in viscosity over time for different -- for different grades of asphalt. And so in this case, I knew the grade of asphalt cement. I was able to use those specific numbers.

And that's what you use to translate your, your absolute viscosity, your dynamic viscosity and kinematic viscosity, and that's the -- that's the amount. So you need -- you need both density and absolute viscosity in order to calculate the kinematic, and that's what goes into the, the model that I use.

JUDGE BIRO: But that doesn't account for the ambient temperature or the temperature of the land on which the asphalt is moving over?

THE WITNESS: No, generally, the assumption is that it's that ambient pressure and temperature, which is obviously an oversimplification of the world, but yes.

JUDGE BIRO: Okay. I don't think I have any more questions. Did my questions raise any questions to you, Mr. Helmlinger?

MR. HELMLINGER: No.

JUDGE BIRO: Okay. Mr. McNeil?

MR. MCNEIL: No.

JUDGE BIRO: Okay. Thank you very much.

(Witness excused.)

JUDGE BIRO: It's 12:32. Would you like to stand in recess for lunch?

MR. HELMLINGER: That's appropriate.

JUDGE BIRO: Okay. Accounting for everything yesterday, should we take an hour for lunch today so that we all come back on time? Okay. So we'll stand in recess until 1:30.

MR. HELMLINGER: Sounds great, Your Honor.

JUDGE BIRO: Okay.

(Whereupon, at 12:32 p.m., the hearing in the above-entitled matter recessed, to reconvene at 1:31 p.m. this same day, Friday, May 17, 2019.)

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A F T E R N O O N S E S S I O N

(1:31 p.m.)

JUDGE BIRO: Madam Reporter, we're going to go back on the record. Okay.

Mr. Helmlinger, do you have another witness?

MR. HELMLINGER: We do not have any more witnesses. We presented what we aimed to present.

JUDGE BIRO: Okay. So you rest?

MR. HELMLINGER: We rest, subject to rebuttals.

JUDGE BIRO: Yes. Okay.

Mr. McNeil, would you like to proceed?

MR. MCNEIL: Yes, please. Thank you. We would like to call Mr. Randall Tilford of VSS.

JUDGE BIRO: Oh, that's no problem. I thought you wanted to make your opening statement at the beginning of your case.

MR. MCNEIL: Oh, Your Honor, if nobody objects, we'll just make closing.

JUDGE BIRO: Oh, that's fine. And you don't have to actually make a closing because we have post-hearing briefs.

MR. MCNEIL: Okay.

JUDGE BIRO: And so that's plenty of opportunity usually to set out all of your arguments.

MR. MCNEIL: Okay. I think at this point, we're -- an opening would probably be superfluous.
JUDGE BIRO: Okay.
MR. MCNEIL: If there's no objection.
JUDGE BIRO: No, no problem. Go ahead.
Madam Reporter, would you please swear the witness.
Whereupon,
RANDALL TILFORD
having been duly sworn, was called as a witness and was examined and testified as follows:
DIRECT EXAMINATION
BY MR. MCNEIL:
Q Good afternoon, Mr. Tilford.
A Good afternoon.
Q First of all, I would just simply like to ask you if you are the company-designated representative of VSS for these proceedings?
A Yes, I am.
Q And you've been in attendance throughout the hearing so far?
A Yes, I have.
Q And would you be kind enough to share with Your Honor and the others assembled here your position, your job title and position at VSS?

A I'm the corporate environmental health and safety manager.
Q And how long have you been so employed?
A Since 2011.
Q And what are your kind of core job responsibilities or job duties?
A Environmental and safety compliance. I also oversee risk, it's not in my title, but those are my core responsibilities.
Q Thank you. And before you were employed with VSS, what was your prior employment?
A I started with South Carolina DHEC. It's the Department of Health and Environmental Control in South Carolina.
Q And how long were you employed in that position?
A It was multiple positions within the agency but approximately 18 years.
Q And just in general, what were your job duties and responsibilities in those roles when you were in South Carolina?
A I started with the Bureau of Air Quality as, as an inspector and emissions testing, going to industrial sites and making sure all the testing methodology was correct and inspecting industrial

sites, all types from BMW to Michelin to asphalt facilities. I -- from there, I proceeded to a position as an oversight inspector, meaning we have 12 districts in South Carolina with roughly two inspectors per district. My job was to train them and make sure they were doing their jobs properly and making sure we were inspecting -- inspecting properly and working with the facilities and things of that nature.
From there, I proceeded to become the pretreatment compliance manager and roughly what that means is I was -- oversaw 62 municipalities in South Carolina. And in wastewater treatment facility plants, industries have -- industries are what are called either significant industry users or categorical industry users. And they're required to pretreat their waste at their site prior to being moved to a wastewater treatment facility of the city so that it doesn't kill the plant, so to speak.
My job was to make sure that the issues were inspected; the municipalities were taking care of what they needed to do. I performed audits. In fact, we were -- we worked with EPA on an audit of our program and, and I'm proud to say we had a perfect record. The latter part of my career, I was a compliance

officer and enforcement officer and an inspector in relation to storm water.
A compliance officer basically asks, like a detective, takes a, a report from an inspector, evaluates it, determines violations, things of that nature and forwards it to the enforcement officer. The enforcement officer conducts hearings. There'll be attorneys there. We issued consent orders, consent decrees, things of that nature, administrative orders, noncompliance orders. And I also performed storm water inspections, so that was the span of my career.
Q Very good. Thank you. And do you hold any post-high school degrees?
A Yes, I attended Purdue University. I was studying both pre-veterinary medicine -- that's kind of where I -- my science background and also agricultural economics. My degree is a BS in ag econ.
Q Okay. Thank you. While you were at VSS, did you have the West Sacramento plant within your sphere of responsibility?
A Yes.
Q And I think -- I believe you said you started in about 2011. Did there come a time shortly thereafter where you had an opportunity to review the environmental status of the West Sacramento plant?

A Yes.
Q And what did you -- in that initial review or during that initial time frame, were there any issues that came to your attention?
A Well, I think we or I realized it needed -- this spill plan specifically needed revision. We needed to do some work on that. So that was something that came to the forefront of what we needed to do.
Q So you're referring to the SPCC plan?
A Yes.
Q Yes, okay. And did you develop an understanding of whether the facility had already an SPCC plan that was current?
A They did have an SPCC plan. I know it was time for review, and so that's -- I initiated a review.
Q And this would've been in roughly the 2012 time frame?
A Correct.
Q And did you engage an outside environmental firm to assist VSS with that?
A Yes, Condor Earth Technologies.
Q And was there an individual at Condor that you principally interfaced with?
A Yes, Wesley Greenwood. He was my primary

and pretty much only contact.
Q And during the -- during the first half of 2012, was Condor able to meet the needs of VSS in terms of developing such a plan?
A We spent a significant amount of time working together to develop the plan, yes.
Q And was that plan finalized?
A To my knowledge, yes.
Q Oh, okay. And were there -- was there any agency involvement, any agency oversight in 2012, in the first half of 2012 that needed to be attended to regarding that plan?
A Well, there were two regulatory entities that I dealt with, and that was the CUPA and, actually, EPA.
Q So and the CUPA was -- is that Yolo County; is that correct?
A Yes, it is, correct.
Q And is there an individual that you principally interfaced with for Yolo County?
A Michael Sears, yes.
Q And did the CUPA -- was the CUPA involved in the development or the finalization of the SPCC plan?
A Yes, Michael and I had a lot of contact conversations, yes, absolutely.

Q Can you just describe generally kind of the highlight of -- highlights of that period of time when you were interfacing with Condor or the county in terms of the finalization of the Condor plan?
A Sure. Along the way, there was an inspection by CUPA. Michael Sears conducted an inspection. I attended it, along with him. And he gave us his inspection report. We sat down. We did a closing conference, listed the deficiencies and I let him know that absolutely, we wanted to work together. That's my policy, whether it was on the regulatory side or with industry is cooperation's always easiest working with any entity, whether it's a business or a regulatory agency. I told him I had an open-door policy, whether it was records or if he wanted to come onsite, absolutely. I'm -- I -- my staff is instructed to have that same policy.
Q And did you have any opportunity to discuss the -- your approach that you just described for us with Mr. Greenwood?
A Yes, absolutely. Mr. Greenwood was under the same instructions. It doesn't matter whether it's a consultant or a staff member. It can be someone in the shop. They all have the same instructions from myself as you cooperate and work with the regulatory

agencies.
Q All right. All right. Very well. During the first half of 2012, and I'd like to please ask you to take a look at -- do you see the exhibit binders there?
A Yes.
Q RX47 at Page 1, which I'll just identify is an email exchange between Randy Tilford and Michael Sears and others.
A Yes.
Q Just Page 1 of that, the bottom half.
A Okay.
Q Let me know when you have -- do you have that?
A Yes.
Q Okay. Everybody have that? Okay. Do you see in the bottom half, an email dated June 4, 2012 at 9:51 a.m.?
A Yes.
Q And that's addressed to you from Michael Sears?
A Yes, I do.
Q And could you just -- if you don't mind, please read out loud the first paragraph?
A "All of the pending violations from the APS

(phonetic) inspection, which took place on January 19th of '12 are considered corrected and have been cleared in our system. The date of correction is June 1st of '12."

Q Okay. Thank you, Mr. Tilford. And so does that -- does that reflect -- does that email reflect conversations that or this email document or correspondence that you had with Mr. Sears at or around that time regarding the status of the compliance of VSS with Mr. Sears' program?

A Yes, it does.

Q So as of the -- let's just say the middle of 2012, what was your understanding of the compliance status of the West Sacramento plant?

A That we were compliant. I take great, great pride and the company takes great pride in meeting compliance, so we felt very good.

Q And you had -- there had been an, an inspection. There had been some items identified. You had taken action and those had been cleared?

A Yes, yes.

Q And then moving forward a few months, and you may have been here -- I believe you were when there was testimony earlier about an EPA inspection at West Sacramento, again, on I believe it was November

27, 2012. Were you present for that?

A Yes, sir, I was.

Q And can you tell us who else was -- or, I guess, how did -- what was your understanding how that inspection came to be? Were you notified in advance or, or --

A Yes, yes I was notified, absolutely.

Q All right. Do you remember by whom you were notified?

A I believe by Ms. Witul.

Q Okay. Did she call you or email you, something like that?

A I don't remember.

Q Okay.

A I know -- I know she properly contacted me.

Q And you're -- by the way, you're not at the -- you're not at the West Sacramento plant every single day?

A No, I'm not. No, I'm not.

Q But you were made aware of this inspection?

A Yes, sir.

Q And just to -- again, to the best of your recollection, who was present when Ms. Witul arrived?

A To the best of my recollection, it was myself, Jeff Nowlin and Pat McNairy.

Q All right. And did Ms. Witul have anybody accompanying her?

A I believe Mr. Sears was with her.

Q And let's see, did they arrive in the mid-morning, late morning, something like that?

A Typically, we arrange these in the mornings, but I honestly don't remember.

Q And did you or one of the other gentlemen you mentioned escort Ms. Witul and Mr. Sears through the facility?

A I believe all three of us did, yes.

Q Did they ask for any documentation, to your recollection?

A Yes, initially, Ms. Witul presented her credentials and, and I, I know she asked us for some documentation, but we did a walkthrough first, prior to reviewing documents.

Q And during the walkthrough, was that relatively routine, do you remember anything or was it --

A It was rather, I guess, innocuous, or quiet is the word. There weren't a lot of comments, maybe some questions here and there. There -- I know there was a comment about the caps on the rail cars and a sign in the emulsion plant area, but it was relatively

quiet. There was not a lot of commentary.

Q And if you were asked for any documentation, did you go ahead and provide that?

A Yes, yes.

Q And was there a closing conference I think was the term you used earlier. Was there anything like a closing conference at the conclusion of the inspection?

A Yes, there was.

Q And what do you -- what do you recall from the closing conference in terms of the back-and-forth between EPA and VSS?

A Well, what I remember from the comments was that Ms. Witul was going to take all of the material back to her office to review. There were -- there may have been a few comments made, but I don't remember if she was going -- had other inspections. I got the impression maybe there was a vacation involved as well. She was going to be gone for a few months. I know there was not a lot brought to our attention other than with this being a federal inspector and, you know, I'd been on the regulatory side for so long, I mean this is extremely important. We wanted to be compliant. We wanted to make sure we were doing the right thing, but it is kind of, you know, you have a

federal inspector there, so you want to make sure, you know, everything's in order and I asked the question is there -- is there any major issues here, and the only comment I received was I see nothing here that would result in any penalties or fines.

Q Okay. And then when was the -- do you remember if you ever received a written follow-up, a notice of violation or something like that from the EPA?

A No, I remember waiting and waiting, thinking something might come, and months and months went by. And then I just took it to the other inspections she had to do or the vacation or whatever occurred. And I do not remember receiving an inspection report.

Q And if you received again any follow-up inspection report, do you remember what time frame that would've been after the initial inspection?

A It would've had to have been in six months or so, maybe something along that time frame because I know that we actively worked on correcting any issues that might've been. We, we take great pride in if an inspector gives us 30 days to doing something, we try to do it in 10 or something of that nature. And we've been very successful at that.

Q Did you -- sometime thereafter, do you

remember, and I think there's been some testimony from Ms. Witul on this point, but EPA contacting VSS with the request for written information?

A Yes, sir, yes.

Q And to the best of your knowledge, was that complied with?

A Yes, sir, to the best of my knowledge.

Q And thereafter, Ms. Witul, if you recall this testimony, testified that EPA sent VSS what the -- what's referred to as a show cause letter.

A Yes, I do remember.

Q And following the receipt of that letter, do you recall that an in-person meeting between EPA and VSS was scheduled?

A Yes, I do.

Q And if I said that was in the middle of 2014, does that sound about right to you?

A That sounds reasonable.

Q And to your recollection, who was present at that meeting for EPA?

A I believe Andrea and Josh were both there as well --

Q Okay. And Mr. Helmlinger?

A Yes, Mr. Helmlinger, yes.

Q And Ms. Witul?

A Yes.

Q Anybody else from EPA that you recall?

A Not that I recall. No, sir.

Q And did you have anybody else from VSS with you?

A We had other personnel there. I believe there were three or four total individuals.

Q And do you remember the general substance of the, again, kind of any back-and-forth and just sort of by topic, what was discussed?

A Yes, I, I, I know we talked about the FRP plan, and the discussion was, you know, we're interested. We'll, we'll take any help from EPA or anyone that can guide us in the proper direction of developing an FRP or how to do it the right way. We didn't know. And so there was a lot of that discussion of how do we do this; what do we do? What are you looking for? And the resulting comments we received were essentially it was an expanded SPCC plan, that it, it didn't need to be something major, dramatic, just an expanded SPCC program.

Q Okay. And following up on that meeting, did you continue to engage Condor for this next round of work?

A No, we contracted WHF out of Oakdale.

Q And did you -- did you -- were you principally in charge of that relationship between WHF and VSS?

A Yes, that's correct.

Q And did you task WHF with any assignments following up on the in-person meeting with EPA in 2014?

A Yes, we did, for development of the FRP.

Q As you understood that?

A Right. And in working with EPA, I learned early on, and I instruct the staff that I work with now to build those relationships with the regulatory community and do our best to try to do things ahead of time. So not having the knowledge on our part, you know, WHF has a lot more expertise and the, the main direction we had was let's make sure we're compliant and then let's work with EPA. We have no desire to work ASAP (phonetic).

Q Was there -- was there any issue that you recall raised -- I think Ms. Witul testified about tank integrity testing at the West Sacramento plant?

A Yes.

Q Yes, and did you task WHF or any other personnel to follow up on that item?

A Yes, Mr. Craig Fletcher.

Q And who is he?
A A tank integrity expert, you know -- expert. He's very familiar with that program.
Q Did VSS formally engage him?
A Yes, yes, we did.
Q Was that also in 2014 or thereabout?
A Correct.
Q And what was involved generally in his assignment?
A I asked him to make sure, one, that we were compliant, that we were working with EPA to develop some sort of program, testing schedule, proper testing methodology, things of that nature to meet the requirements.
Q And did he issue a report sometime thereafter that you sent on to EPA?
A Yes, he did, correct.
Q And do you recall that there was another meeting in person between VSS representatives and EPA representatives the following year?
A Yes, I do. Yes, sir.
Q Did you attend that?
A Yes, sir, I did.
Q And if you recall, who was present for EPA at that meeting?

A To the best of my recollection, it was only J. Andrew Helmlinger.
Q Was -- do you recall if Ms. Witul was -- had tentatively been designated as a person to attend?
A I think from our side, we thought she'd be there, yes, we, we wanted to have a discussion.
Q Based on that meeting, what was your understanding of what VSS would do -- this is now in 2015, what VSS would do to respond to, in particular, these two issues that EPA had commented on? That's first -- let's say first the facility response plan, where did that stand in 2015?
A I think the intent on the meeting, we -- because I know we brought several experts and consultants to it, was to discuss compliance and meeting compliance. Our intent from the beginning, the middle, and now is still compliance. And so we wanted to show what we were doing. You know, we wanted to cooperate.
Q Let me ask you to take a look at RX14.
A Okay.
Q Which is an email exchange between EPA and VSS representatives. And, if you would, just look at the top. Just read to yourself the top paragraph, just those four lines. This is dated April 24, 2015.

Was this -- to your recollection, was this email sent after the additional meeting between VSS and EPA?
A I can't say. I, I, I don't know.
Q But this email talks about VSS taking some additional --
A Yes.
Q -- steps, in terms of an engineering analysis?
A Yes.
Q Did you -- did you task WHF or somebody to do that?
A WHF has bene our, our primary consultant on, on this project.
Q And as far as you know, did they go forward and submit that to EPA?
A Yes.
Q And if you would, take a look at Exhibit RX22, and this is dated July 8th of 2015.
A Yes.
Q And did you see -- you're not addressed on this email, but did you see a copy of this email at or around that time, to the best of your recollection?
A Yes.
Q And was it your understanding that as of July of 2015, that EPA was going to consider the

information submitted by VSS and then provide any constructive commentary it had back to VSS?
A Yes, in, in all of our discussions, we viewed EPA as a partner in this. And someone that we wanted to work with and come to conclusions so we could move on to other things. And our understanding was EPA was the experts. WHF was the experts. The information submitted, we expected commentary back, yes. We figured it was constructive commentary.
Q Okay, thank you. And could you just take a good look at RX52, which is an email from the following month. This is now an August of 2015 email between -- email exchange between you and Mr. Sears. And just -- if you would, just read the first line at the top. And if you can give me your recollection of the -- whatever this issue was with the tank testing that you and Mr. Sears discussed.
A "Randy, very good with the integrity testing. I had asked that question via email during my review of the SPCC plan and did not receive an affirmative answer. I was told it was unknown, which I interpreted as a no."
Q And then he asks for some documentation. Did VSS provide that?
A Yes.

Q And there was an inspection -- a second inspection of VSS the following year, 2016, in September, Ms. Witul testified to that. Do you remember that?
A Yes. Yes, sir.
Q That was September 30, 2016. And my question is, to your knowledge, between July of 2015 and September of 2016, do you -- do you recall getting anything in the nature of kind of constructive comment from EPA that you recall receiving during that interval?
A No, sir.
Q Okay.
A We, we did know where, where things stood. We were expecting communication.
Q And did you also -- were you also present for Ms. Witul's testimony that she had prepared, I believe, two what are referred to as FRP checklists. One was prepared in January 2017, and one was prepared in September of 2017. Were you here for that testimony?
A Yes, sir.
Q Do you -- do you know if you ever received either of those documents?
A No, sir, we never received. I, I didn't

know until recently it had even occurred.
Q And do you -- do you recall that Ms. Witul also testified about facility response plan costs when she was discussing the penalty -- proposed penalty calculation that EPA had worked out?
A Yes, sir.
Q And she described a figure of $28,159, and if you recall, some of these costs were related to preparation of FRP plans, implementation, that sort of thing. And I know you may not have the exact number, but if -- are you able to say whether the amount that DSS spent on those items you testified is higher than $28,159?
A Oh, absolutely. Absolutely.
Q Quite a bit higher?
A Yes.
Q And then just one more question for your -- now, there was two exhibits that were referred to earlier, and they are, just for reference, CX35 and CX36, and again, this was part of the -- it was part of the analysis for the proposed penalty. And those documents -- those documents, let's just say ballpark, reflect gross sales of $25 to $50 million for VSS. Does that sound in the ballpark to you for gross sales?

A Yes, sir.
Q Do you have an understanding, Mr. Tilford, of the difference between gross sales and net income?
A Yes, sir.
Q And what is that understanding?
A Gross is what you're making for the product, and net would be what you have left over after cost.
Q And do you have with the -- you know, with -- you don't have to provide any of the exact numbers, but do you have any estimate of what the net income of VSS has been over the last few years?
A I can't give you an absolute, but I can tell you that I had many discussions over the years. And when I came to the company, and for several years after that, I know that there was severe distress. The company was trying to survive the impact of the banking situation in 2008, '09 and in that area, it devastated the construction industry. And conversations with our CFO, with CEO and such, it was -- I can't even begin to describe the stress. People not sure if we'd have jobs in a week, things of that nature. This company had been in business for, you know, years, decades. And I was very proud to be a part of it, but I can tell you it was extremely high-stress because we didn't know from week to week

whether we were going to survive it.
MR. MCNEIL: Okay. Thank you, Mr. Tilford. Your Honor, may I just have a moment?
JUDGE BIRO: Of course.
BY MR. MCNEIL:
Q Oh, yeah, on that last point, is VSS a family-owned business?
A Yes, there's a -- it started out with the great-grandfather and then the grandfather, he -- the grandfather was the chairman. He passed away about three years ago. A great gentleman. The son is, is now head of the company with the wife. She's a chemical engineer. He's an engineer. The oldest son is coming into the business. We have a lot of second, third-generation employees there. We have husbands and wives that work there.
And it's one of the reasons I really enjoy working there is because as hard as you, you work and, and try your best, they take great pride in, in taking care of families. We, we have discussions at the senior manager level and executive level of we will take care of our employees, and we will make sure that our business is viable so that employees can go out and live and enjoy life.
Q And just one other thing, when you were

working with Mr. Greenwood and Mr. Sears, if you recall back in the first half of 2012, we talked about that, were you -- I think you had talked about the instructions you gave Mr. Greenwood.

A Yes, sir.

Q Were you -- were you looking to him to provide the technical support that Mr. Sears was asking for?

A Yes, sir.

Q And I guess just the last question, I think there was some uncertainty about this earlier. You participated in a collection of documents that were submitted to EPA that showed for Tank 2001, a date of service of May 21, 2013.

A Yes, sir.

Q What was that -- how was that information transmitted to you?

A I received that information from Mr. Pat McNairy, who, at the time, I believe his title was operations manager. So he was -- he would've had far more knowledge than myself.

MR. MCNEIL: Okay. Nothing further at this time, Your Honor.

MS. SUGERMAN: Can we have about ten minutes?

JUDGE BIRO: Sure.

MS. SUGERMAN: Thank you.

JUDGE BIRO: We'll stand in recess for ten minutes. Please don't discuss your testimony with anybody.

THE WITNESS: Yes, Your Honor.

JUDGE BIRO: Not the lawyers, family or anyone.

THE WITNESS: I can stay here if you want me to.

JUDGE BIRO: No, you may go to the bathroom. You can take a break.

(Whereupon, a brief recess was taken.)

JUDGE BIRO: We're going back on the record.

CROSS-EXAMINATION

BY MS. SUGERMAN:

Q Mr. Tilford, hello.

A Hi there.

Q I am going to try and do this in an organized fashion. I do not know what I will achieve. I'd like to start with your experience as a regulator. I'm requesting that background. I think it's pretty valuable here. Do you understand generally the SPCC and FRP programs are generally risk-management programs?

A Yes, ma'am.

Q And given your experience as an inspector, allowing a company to avoid risk planning while waiting for a response, would you consider that compliance at that time?

MR. MCNEIL: Objection, asks for a legal conclusion.

JUDGE BIRO: Overruled. Go ahead.

THE WITNESS: I would've tried to actively work with any company or individual, as I did when I was a regulator, to bring them into compliance.

BY MS. SUGERMAN:

Q And generally, if in the time it might take them to get into that compliance, as a regulator, delaying risk management, does that seem like it would cause some harm, potential harm?

A Not necessarily, ma'am. We took -- our agency and myself took great pride in working with people and working with anyone that came into our realm to bring them to full compliance. We, we viewed it as -- we viewed enforcement as the last option and compliance as the primary.

Q In your role, you were implementing a regulatory program, were there regulations at issue that you were applying or was it statute?

A Yes, ma'am.

Q It was regulations -- and did you generally feel that it was the company's responsibility to ensure it was in compliance? I understand there's a level of compliance assistance with the regulator, but in terms of where the buck stops, is it the company's responsibility to remain in compliance or are they generally allowed to wait until the regulator says yes or no?

A Well, to answer your question, we were directed straight from the top, even from the governor to do our best to work with anybody that we could, and I found that typically 99.9 percent of the time, we, we came to a mutual compliance standpoint.

Q Okay. I have a few questions about the 2012 inspection. Do you recall if at the 2012 inspection, whether tank inspection records -- tank integrity records were available for EPA's review?

A I don't remember specifically. I know asking for inspection records and prior to my arrival, and I know that since I got there, we insisted on, on inspections, so I do know inspections were done.

Q And when you say inspections, can you describe what you mean for me?

A Site and, and everything from inspecting the

entire site to spill prevention to piping to corrosion and to anything of that nature. We -- there would -- there would actually be daily walkers. I know it's not required, but there were -- there were dailies. There was weeklies. Things of that nature.

Q Are you familiar with the industry standards that would apply to many of the tanks at VSS?

A I don't consider myself an expert, but yes, I have some understanding.

Q Are you familiar with the different levels of tank inspection, as opposed to sort of the visual --?

A Yes, ma'am. Yes, ma'am.

Q And are you aware that every five years, there's supposed to be a certain amount of external integrity testing by a professional -- a certified tank inspector?

A Yes, ma'am.

Q So when you started there, did you get a sense of whether those were being conducted?

A I don't believe they were, no.

Q So probably those records were not -- were those -- those records would not have been available --

A No, ma'am. No, ma'am.

Q -- at the time of this inspection? You mentioned that during the walkthrough, during the inspection, there was a question about caps at rail cars; do you recall that?

A Yes.

Q Can you explain that to me?

A It was just a casual comment. I think the rail cars -- the lines from the rail cars to -- there was -- the caps were not on.

Q Do you recall any other discussions about Tank 2001?

A I do not recall specifically. It's been a number of years.

Q Sure, I understand. And railcars, what was your understanding of the relationship between rail cars and the asphalt tanks, Tank 2001 --

A Well, to be honest, at that time, in, in that time period, I was really getting used to the company and what was going on, so my focus was not on operations. I, I can honestly say I did not have a lot of knowledge of the operations at that time. I was simply trying to bring in my regulatory experience and knowledge to bring everyone into compliance.

Q I have a few more questions.

A Sure.

Q I'm just going to need to get a little organized here. Okay. Can we -- I don't think I brought the binders up. Will you turn to RX52? And then we'll also look at RX53. Give me a moment to grab those binders.

A Sure.

Q So RX52, we already looked at, and that's a communication from Michael Sears about integrity testing, correct?

A Correct, yes.

Q And will you look at RX53, please?

A Yes.

Q So can you just read that second paragraph, the one that starts of course?

A "Of course, the facility is not in compliance with 1128C6 integrity testing requirements at this time because there are tanks in the facility that have not been tested like they should've been, but I think the schedule, as outlined in the SPCC plan is reasonable. If the schedule is being followed, I don't see a problem."

Q And now this is October 2015, so I think the SPCC plan at issue is the 2014 integrated plan we've been talking about, which I think is at CX17. Let's go back to the white binder.

A You said 17, correct?

Q CX17, I'm giving you a second to find the page. Starting on Page 103, please.

A Okay. Nope.

Q Or let's try 100. Okay. Can you identify this document for me?

A It's Fletcher Inspections, a letter from Mr. Craig Fletcher.

Q And we'll turn to Page -- or let's confirm, this, to me, looks like the document likely that Michael Sears was referring to in his email. Does that sound right?

A More than likely, yes, ma'am.

Q If you would turn to Page 104, please, so this is the schedule that Fletcher is recommending.

A Yes, ma'am.

Q It shows in the 2014, 2015 winter season, a certain number of tanks to be inspected. And the rest of the page, I don't know if you want to take a second to look at it, it sets up a schedule that I think Mr. Sears was referring to --

A Yes, ma'am.

Q -- for when the tanks would be inspected. To the best of your knowledge, was this schedule followed?

A No, ma'am.
Q And do you recall when the first external inspection was actually conducted?
A To the best of my recollection, I would say 2015. It was, Powers Engineering inspected roughly ten tanks, I believe.
Q Okay. I --
A Or I, I'm not exact on that.
Q -- I do know a lot of those are in the record, so if you'll give me a second, I can find one of the first of those. Starting with RX54, please.
MR. LUDWIG: That's not the first chronological one.
MS. SUGERMAN: I understand, yeah. Thank you for pointing it out.
MR. MCNEIL: Your Honor, my apologies, and I know there's not really a question pending, but I want to just note that I think we're getting a little bit beyond the scope of direct here, and we have an expert who's going to testify on the subject, so I'm not lodging an objection, but I'm hoping counsel will be -- take that into consideration.
JUDGE BIRO: Okay. So what exhibit are we looking at now?
MS. SUGERMAN: 54 was the one I directed him

to.
JUDGE BIRO: Okay.
BY MS. SUGERMAN:
Q Does that appear to be the Powers Engineering type of the report that you're talking about?
A Yes, ma'am.
Q And then what's the date on that one?
A November of 2016.
Q And I don't know if I need to take everybody's time going to RX65, but RX65 has an inspection date of June 2016, and I think that's the earliest one in the record; does that sound possible to you?
A It may be.
Q So just to confirm, the plan was to do the integrity testing starting in 2014. It didn't really get done until approximately two years later, 2016, right?
A Yes, ma'am.
Q Okay. There was a question about the company's financial abilities. Do you know if in this -- in the five years or so that EPA and VSS have been discussing, has VSS ever submitted financial information or indicated in any way that it can't pay

penalties?
A I'm not sure, ma'am. I'm, I'm not.
Q Okay. When we were trying to determine the date that Tank 2001 came online, was there any attempt to verify by looking at the manifests of incoming product to determine the actual start date?
A No, I, I did my best, and that's the only date I can come up with.
Q Are you aware that in the federal -- in the actual regulations, there's a model facility response plan?
A No, ma'am, I'm not.
Q So the regulations have a model facility response plan, and in terms of achieving compliance, what -- at some point, VSS hired a contractor to develop the facility response plan. Was it the intent to come into complete compliance with those requirements?
A The intent was cooperation, ma'am, we -- the entire time we've done this, that was always our drive. We didn't have the expertise, so we were using our consultants and, and doing our best to cooperate. It was -- it was in the interest of cooperation.
Q Moments ago, we were looking at the 2014 integrated plan, is -- in your opinion, is that a

final submittal by VSS, the 2014 plan? We had -- it was CX17, if that helps.
A CX which one, ma'am?
Q CX17. And so my question is so this is a -- what's called an integrated plan, right? It looks to satisfy several requirements at once. Once this plan is submitted to various agencies, is it generally your intent that this is the final plan for the circumstances?
A It's always the intent, but I think there are times where we've had drafts going back and forth and communication, whether it's with y'all or whether it was with CUPA. So our intent is always to submit a final, but there are times where we have asked for communication and send that communication back and forth.
Q In the event a draft is submitted, which plan would you consider enforced? Say there's an emergency at your facility, what plan would your people turn to with response?
A It would be the final we're using, ma'am.
Q So, for example, in this case, if something happened October 24, 2014, this plan, even though it may have been a draft in some context, this would've been the plan relied on to respond to any emergencies?

A If this was a, a final, that would be the plan that we would be using.

Q So at your facility, would someone have needed to find the -- say the last final plan was the 2012 SPCC plan and, yet, maybe this one is in a file, but it's still waiting for some completion, in an emergency, which plan should your facility personnel turn to?

A Well, typically, you know, unless we were talking about the FRP specifically, typically, the spill plan, we -- or this is a combination plan here, we would determine that it was final, but when it was coming to the FRP, we were in the middle of discussions and things of that nature. So from a spill prevention standpoint, we would use whatever we developed at that point.

Q So are you indicating that the spill prevention control and countermeasure plan was likely final, but that the facility response plan might still have been in flux?

A I think so, ma'am.

MS. SUGERMAN: Okay. One moment, please. Those are all my questions. Thank you very much.

JUDGE BIRO: Any redirect?

MR. MCNEIL: Nothing further, Your Honor.

JUDGE BIRO: Can I just ask you a couple of questions?

THE WITNESS: Yes, ma'am.

JUDGE BIRO: You said that VSS was a family-owned business?

THE WITNESS: Yes, ma'am.

JUDGE BIRO: I think there was some testimony about it being a wholly owned subsidiary of another corporation, Basic Resources?

THE WITNESS: Yes, ma'am.

JUDGE BIRO: So it's not really family-owned. It's owned by another corporation?

THE WITNESS: Well, the, the family runs the business, ma'am.

JUDGE BIRO: Who owns Basic Resources?

THE WITNESS: It's the Reed family that has the -- that's the father and wife and son that I was talking about.

JUDGE BIRO: Tell me their names again.

THE WITNESS: Jeffrey.

JUDGE BIRO: Jeff Reed, R-E-E-D?

THE WITNESS: Yes, ma'am.

JUDGE BIRO: And he owns Basic Resources?

THE WITNESS: He is the CEO and owner.

JUDGE BIRO: Other than Jeff Reed, is there

other owners at the corporation?

THE WITNESS: I, I believe Ms. Reed and the son, Jordan Reed. I don't know, I'm not privy to all of the ownership information, but those are the individuals that, that we report to in our company.

JUDGE BIRO: What's Mr. Reed's wife's name?

THE WITNESS: Margaret.

JUDGE BIRO: Margaret. Other than this wholly owned subsidiary, VSS, do they own, through Basic Resources, a number of other corporations?

THE WITNESS: Yes, ma'am.

JUDGE BIRO: And what are the names of those corporations?

THE WITNESS: There would be George Reed, Inc., 711 Materials, Inc., Reed International.

JUDGE BIRO: Okay.

THE WITNESS: I believe that's it. I think there's some properties, but --

JUDGE BIRO: Is Basic Resources owned, in any way, by any other corporation?

THE WITNESS: Not that I'm aware of, ma'am.

JUDGE BIRO: Okay. And none of these are publicly traded corporations?

THE WITNESS: No, ma'am.

JUDGE BIRO: Now, remind me again exactly

when you started at this company?

THE WITNESS: 2011, ma'am.

JUDGE BIRO: And in 2011, was Tank 2001 in service?

THE WITNESS: I specifically cannot say. I wasn't -- I had nothing to do with operations, so in my search for the answer, that's when I reached out to Mr. McNairy, who, at the time, was with the company, and asked that question.

JUDGE BIRO: So you don't have personal knowledge of any --

THE WITNESS: No.

JUDGE BIRO: -- year or date within a year when that went into service?

THE WITNESS: No.

JUDGE BIRO: Okay. Were there, at any point, any spills or releases at this facility?

THE WITNESS: At, at that time, ma'am or -- there had been some minor ones, yes.

JUDGE BIRO: Tell me when such spills and releases occurred.

THE WITNESS: I believe we had four or five-gallon latex material a couple years ago. There's been a few gallons of diesel here and there, but there's not been any -- there's been no major releases

of any kind.
JUDGE BIRO: Have you ever had to put this SPCC plan into effect?
THE WITNESS: Well, we've put it into effect on a regular basis, meaning we do inspections and, and things of that nature.
JUDGE BIRO: No, but containment, in the event of a leak or a release?
THE WITNESS: Yes, ma'am.
JUDGE BIRO: So you did put it into effect with these smaller releases?
THE WITNESS: We have everyone trained, a team trained for responses and things of that note. And they're trained to take the appropriate measures if they can safely clean them up and report them and document them and take pictures. Yes, ma'am.
JUDGE BIRO: So is there standard yearly training conducted?
THE WITNESS: Yes, ma'am. There is an annual -- it's roughly a 140-some page PowerPoint that we do, including all of these regulations. They train at safety meetings. They have conducted drills. We've done a number of things, and we've, we've taken a lot of measures, protective measures for the site.
JUDGE BIRO: Do you do that in-house

training or do you hire an outside company to provide that training?
THE WITNESS: Both.
JUDGE BIRO: Both.
THE WITNESS: Yes, ma'am.
JUDGE BIRO: So how many hours of total training does each employee get?
THE WITNESS: Well, the, the employee orientation is three days, I, I believe three days.
JUDGE BIRO: And that would cover the SPCC --
THE WITNESS: That would cover the S -- that would cover everything that the employees need to do. It could be workers comp, things of that nature, but this portion might be a few hours, during that time frame, as well as I have a gentleman that works for me onsite, and he does regular training. He, he's actually there.
JUDGE BIRO: So is that pretty much his full-time job?
THE WITNESS: It's safety and environmental, yes, ma'am.
JUDGE BIRO: But training of employees?
THE WITNESS: Not strictly. He, he -- that's a portion of his job, but he's out there to

work with the crews. He goes out with the crews to make sure they're being safe and environmentally sound. And, and he's at the site.
JUDGE BIRO: How many employees do you have at the site?
THE WITNESS: Best guess, maybe 60.
JUDGE BIRO: Has that increased or decreased over time?
THE WITNESS: It's just starting to increase as, as business is getting, getting better now.
JUDGE BIRO: And each year, do you think they get five or ten hours of training on SPCC, FRP-related?
THE WITNESS: Yes, ma'am. But one thing that we are doing now is also, we have kind of what's called an LMS system, where we're having training online. So they can take it at a time at the office. It's, it's -- the idea is that this training comes from J.J. Keller, so it's very professional, and they'll receive that on safety and environmental, plus the training from our onsite person.
JUDGE BIRO: How much did the tank testing cost the company when they finally did it in 2016?
THE WITNESS: I, I don't know. That was handled by the current operations manager.

JUDGE BIRO: Can you give me an estimate?
THE WITNESS: Sorry. Best estimate, maybe 20-some-thousand-dollars, in that range.
JUDGE BIRO: You finally had an FRP put into place, did you -- you paid for that from the outside consultant?
THE WITNESS: Yes, ma'am.
JUDGE BIRO: And how much do you estimate that cost?
THE WITNESS: With the revisions that were done over time, I -- I can't give you an accurate number, but I'd say it's probably in the same area.
JUDGE BIRO: $20,000?
THE WITNESS: Yes, ma'am. They conducted training, as well. There was several times they came onsite and conducted training. So there may be training costs as well as the development of the FRP.
JUDGE BIRO: Okay. Was it your understanding when you came on to take over this risk management that your facility or the one that we're talking about here is within the area contingency plan?
THE WITNESS: I was not aware of that, ma'am.
JUDGE BIRO: Did you become aware of that at

any point?
THE WITNESS: During this hearing.
JUDGE BIRO: You mean in the last day?
THE WITNESS: We have not had serious discussions. It might've been brought up in, in the time frame leading up to the hearing, but that was not something that I was active participation -- participant in with -- my concern and my focus and our company's was development of that RFP, regardless of, of where we were -- we were trying to cooperate, we, we wanted to get that FRP going.
JUDGE BIRO: Okay. I don't have any further questions.
Mr. McNeil, would you like to follow up with any questions?
MR. MCNEIL: No, Your Honor. Thank you.
JUDGE BIRO: Okay. No, okay. Thank you very much.
THE WITNESS: Thank you.
JUDGE BIRO: Do you --
MR. MCNEIL: Oh, I'm sorry, I just have one.
JUDGE BIRO: Oh, okay.
MR. MCNEIL: If I may?
JUDGE BIRO: Yes.
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REDIRECT EXAMINATION
BY MR. MCNEIL:
Q Mr. Tilford, just briefly again, I apologize if I asked this earlier, but are you aware that -- whether VSS submitted to EPA its current documentation about these inspections and drills and exercises?
A Yes, we did.
Q And do you -- did you also have an awareness that VSS submitted a signed contract for Patriot and Clean Harbors that were the third-party consultants to respond to the FRP?
A Yes, they were contracted. They have a quick response time. They were contracted to handle response from an FRP, yes.
Q And you saw the signed contracts?
A Yes, sir.
Q And you saw them -- you saw a copy that they were sent to EPA?
A Yes.
MR. MCNEIL: Okay.
JUDGE BIRO: Thank you. Wait one minute, just let's make sure that we're all on the same page here.
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RECROSS-EXAMINATION
BY MS. SUGERMAN:
Q Hi, last couple of questions.
A No problem.
Q Do you know when the documentation was submitted to EPA?
A Originally, I think it was a few months ago, but I know that the documentation was sent in the latter part of April.
Q And --
A We were looking to make sure that you had signed copies.
Q And to the best of your knowledge, I don't have the exhibit in front of me, but we discussed it, we -- there was a list that EPA had sent via email, a list of names of people who needed training, who needed to sign off on a contract, a few things.
A Uh-huh.
Q To the best of your knowledge, do you think that VSS submitted a complete response to that list?
A I know we submitted contracts and inspections that were far-ranging but I, I, I cannot confirm that.
Q And just -- you will object, I am sure, if this is inappropriate, but to the best of your

knowledge, did you -- did VSS submit that to EPA or you submitted something to your attorney to have the attorney submit it to EPA?
A The recent round, I believe I sent to our attorney, yes.
MS. SUGERMAN: Okay. I have no further questions.
JUDGE BIRO: Okay. Thank you.
MR. MCNEIL: I promise.
JUDGE BIRO: Okay. If you start another round --
MR. MCNEIL: I promise -- no, I promise.
REDIRECT EXAMINATION
BY MR. MCNEIL:
Q Mr. Tilford, the email that I, I think we are all familiar with where that additional information was requested, there was a list of somewhere between 12 and 16 individuals, VSS employees, EPA was asking for a reinspection.
A Yes.
Q Do you remember that?
A Yes, yes.
Q And we had it as an exhibit the other day, okay. Can you estimate how many of those employees are no longer with VSS, for various reasons?

A No, sir. I cannot.
Q Okay. Are there some -- do you -- are there some employees on that list that are no longer with VSS, for various reasons?
A I would have to take a look at the list again.
Q Okay. Is Brian Orr still --
A Brian Orr is no longer there.
Q Is Pat McNairy still with VSS?
A No, sir.
Q Is Jeff Nowlin still with VSS?
A No, sir.
MR. MCNEIL: Okay. Thank you.
JUDGE BIRO: Thank you.
Do you want to reserve Mr. Tilford or is -- we're going to release him?
MR. MCNEIL: May we, please?
JUDGE BIRO: Yes, okay.
(Witness excused.)
MR. MCNEIL: And may we have just a few minutes? We're ready with our next witness, but --
JUDGE BIRO: Okay.
MR. MCNEIL: -- a short break. Thank you.
JUDGE BIRO: Sure. We'll stand in recess until five after.

MR. MCNEIL: Thank you.
(Whereupon, a brief recess was taken.)
JUDGE BIRO: Mr. McNeil, would you like to call your next witness?
MR. MCNEIL: Thank you, Your Honor. Respondent calls Kari Casey.
Whereupon,
KARI CASEY
having been duly sworn, was called as a witness and was examined and testified as follows:
DIRECT EXAMINATION
BY MR. MCNEIL:
Q Ms. Casey, good afternoon. I'd like to begin by asking if you could kindly tell us by whom you are currently employed?
A WHF, Inc., Environmental and Engineering Group.
Q Okay. W -- and if I refer to that as WHF is that fair for today, instead of WHF, Inc. Engineering Group?
A Yes. Yeah, we don't normally attach the last part.
Q And does the company have -- when I say the company, WHF, have a home office?
A Yes, in Oakdale, California.

Q In Oakdale?
A Uh-huh.
Q Okay. And is that where you're officed?
A Yes.
Q And what is your current job description?
A Currently, I'm the general and operations manager.
Q And what does that entail?
A I mostly run -- like run project management for most of our -- for all of our projects. And then I have a set of my own projects. And then I just do general administrative oversight and then just general operations for the business.
Q Okay. And do you have any post-high school education?
A Yes.
Q And could you share with us what that is?
A I have a bachelor's degree from Humboldt State University in environmental science, technology and business, with a minor in applied mathematics.
Q Okay.
A Then I have a master's degree from the University of San Francisco in environmental management.
Q Okay. Thank you. And when did you begin

your employment with WHF?
A In July of 2004.
Q And have you been employed with WHF continuously over the roughly last 15 years?
A Yes.
Q And do you hold any licenses or credentials or --
A I'm a certified hazardous materials manager.
Q Okay. And over the course of the past 15 years, have you been involved in various environmental or engineering projects while employed at WHF?
A Yes.
Q And could you give us a flavor for what, what's, what kind of -- what kind of projects you've worked on, just as a general matter?
A Preparations of SPCCs and compliance-related stuff in regards to hazardous materials, hazardous waste, air permitting --
JUDGE BIRO: Too fast.
THE WITNESS: Sorry.
JUDGE BIRO: Okay. Go ahead.
THE WITNESS: Do you want me to repeat that? Okay. So preparations of, of SPCC plans.
BY MR. MCNEIL:
Q How many -- sorry to interrupt, but how many

SPCC plans have you done?
A Well over 30.
Q Over 30?
A Yeah, I think I can put a number to it. It says it in -- and then in hazardous materials management, hazardous waste management and compliance related to that. And then I've done air quality permitting and toxics reporting for hot spots monitoring. I've done --
Q Is that the AB2588 program?
A Yes.
Q Okay, perfect.
A And general compliance permitting, writing ODBRs and storm water permits --
(Phone rings.)
JUDGE BIRO: Go ahead.
MR. MCNEIL: You were saying storm water permits.
THE WITNESS: Yes, storm water, industrial storm water.
BY MR. MCNEIL:
Q And --
A And then --
Q -- no, that's fine. And can you give us, again, just a flavor of the types of industries or the

types of businesses or other clients, whether it be municipal or what have you that you've performed those kind of services for?
A Construction companies, trucking companies. I have a wood -- a wood treating facility, agricultural industry and support services for that I believe. And the bulk, bulk fueling facilities.
Q Okay. And do you interface with environmental regulatory agencies as part of your, your professional duties?
A Yes.
Q And again, just give us a sense of who some of those agencies are?
A Local, local CUPA programs, usually county or fire department.
Q And CUPA, again, stands for certified --
A Certified Unified Program Agency.
Q So for example --
A It's run through the -- through the OES or -- or well, California EPA basically, I don't know the agencies off the top of my head.
Q So that would be, for example, like Yolo County in this case?
A Yes, yes. And we work with the regional board and state DTSC. I have had some interaction

with the EPA on one or two facilities.
Q Federal EPA?
A Uh-huh.
MR. MCNEIL: And, Your Honor, I respectfully request that Ms. Casey be designated as an expert on the preparation of SPCC plans.
MR. HELMLINGER: No objection.
JUDGE BIRO: Okay. So qualified.
MR. MCNEIL: Thank you.
BY MR. MCNEIL:
Q Ms. Casey, did there come a time when you received a reach-out from Mr. Tilford regarding environmental complaints, issues at the VSS West Sacramento facility?
A Yes.
Q And do you recall approximately what year that was?
A Some time in 2014.
Q And do you recall what the general nature of the -- what was your understanding of what you were being asked to undertake or what it was being proposed that you undertake?
A Well, he had -- he had said that there was some issues resolve -- or regarding the SPCC and this potential FRP question and wanted me to attend a

meeting by the EPA.
Q Okay. That was a meeting here in San Francisco?
A Yes.
Q And did you -- did you accept that engagement and go to that meeting?
A Yes.
Q And that was also in approximately 2014?
A I think so, yes.
Q And to your best recollection, who was present at the meeting for -- on the -- representing EPA?
A Andrew --
Q Helmlinger?
A Yes.
Q And was it -- do you recall if anybody else was present?
A I don't recall.
Q And who do you recall being present for WH --
A Just myself.
Q Oh, okay. And was there anybody from VSS there?
A Randy Tilford was there and Jeffrey was also there.

Q Mr. Reed was there?
A Yes.
Q And Mr. Reed is the same Mr. Reed that Your Honor had been -- if you were here 20 minutes ago --
A Yes.
Q -- that Your Honor referred to. And he's the CEO of VSS?
A I believe so. I don't know specifically his title.
Q But you -- he attended the meeting?
A Yes, he did.
Q And do you recall, in general, what the topics were that were covered at the meeting?
A Well, there was some general discussion about the applicability of the FRP requirements and there was some questions raised about that, and then sort of the general consensus, I guess, or what I took away from it was that we were going to be given an opportunity to answer some of those questions, and then in the meantime, present our consolidated plan, which included some additional emergency response stuff that's in addition to the SPCC guidelines that we thought would maybe sort of bridge a gap a little bit on this FRP issue in the meantime until we got some commentary back.

Q Okay. Thank you. And when you -- when you use the phrase 'bridge the gap', does that refer to something that was discussed at this meeting?
A No, just that in, in general, it wasn't -- we were -- we were -- I think that the -- what I recall was that it was that maybe a full FRP would maybe not be required, depending on the information we were submitting but that we would, in an effort to comply, submit some additional emergency response procedures and such and see if that would, would be sort of in a, a modified submittal.
Q Now, your understanding is that was what had been suggested by EPA as a possible --
A That was the direction I took from that meeting, yeah.
Q And then did you, in fact, thereafter, proceed to undertake that assignment?
A Yes.
Q And was that under the direction of Mr. Tilford and on behalf of VSS?
A Yes.
Q And at the meeting, were there -- were there any other compliance or potential compliance issues that you recall were discussed?
A Well, I believe there was some discussion

about the tank integrity, and now that I think about it, Craig Fletcher was also in attendance at that meeting.
Q Craig -- Mr. Fletcher was in attendance?
A Yes.
Q Okay.
A And he, he discussed that with -- yeah, he was discussing that.
Q And what was -- what was your takeaway of what Mr. Fletcher was possibly being asked to do, as discussed at the meeting?
A I believe he was going to put together a schedule for the integrity testing, a submittal for what would be required in that schedule to get that done.
Q Okay, very good. And then there was some discussion that you may have been present for about a November 27, 2012 EPA inspection, VSS. Are you familiar that there was such an inspection?
A Correct.
Q Were you present at that?
A No.
Q Had you been engaged by VSS for West Sacramento as of that date?
A Not for that -- not for that issue, no.

Q And did you have an understanding whether there was another environmental consultant who was assisting VSS with that?
A Yeah.
Q And who was that?
A Condor Earth Technologies, I believe.
Q Condor Earth Technologies?
A Yeah.
Q Okay. And so did you -- so in the -- after the EPA meeting, is it fair to say that you -- WHF sort of took over as the consultant of record for these EPA matters for VSS for West Sac?
A Yes.
Q Okay.
A When we were at that meeting, Randy told me to, to prepare the documents then to submit.
Q Okay.
A Yeah.
Q So that was -- that was the -- if not the exact date, that was the general time of your mediation?
A Correct.
Q And had you worked with -- had you worked with VSS on other projects?
A Yes. We wrote their industrial storm water

permit rider to the SPCC.
Q And had you worked with Mr. Tilford before?
A Yes.
Q And did you hear Mr. Tilford's earlier testimony today about compliance?
A Uh-huh.
Q Do you have any different view about VSS's --
MR. HELMLINGER: Objection, goes beyond the scope of expert's knowledge.
JUDGE BIRO: But it may be her personal knowledge.
MR. HELMLINGER: But there's no foundation for that, so I want to make an objection.
JUDGE BIRO: Overruled. Go ahead.
THE WITNESS: I'm sorry.
MR. MCNEIL: Well, based on the other projects that you had worked on with DSS and Mr. Tilford, did you -- did you have the same impression as was testified earlier to the company's commitment to compliance?
THE WITNESS: Yes. I mean generally, we -- because we worked with DLM (phonetic) on, on a wide range of projects and facilities. And just general, you just do what you have to do. We would get it

done. Let me know what I need -- you know, let me know what we need to do. So that's, that's usually his direction, yeah, or is his direction.
BY MR. MCNEIL:
Q And so going back to the, the FRP plan for a moment or this kind of modified -- this modified plan you'd mentioned, what were the steps that you took after the meeting with EPA to follow through on that task?
A Well, we all specifically had to go back and rewrite the entire SPCC plan. So it was sort of the main focus was, was writing the SPCC plan. We did some -- well, their engineer did some survey work, and we did the demographic map at that time. And then we just tried to look at the general guidelines for the FRP and see if we could sort of fit in certain sections and kind of make that contingency plan that we normally write, fit a few of the guidelines from the FRP.
Q Okay. And did that culminate in the issuance of any final report or draft report or anything like that from your office?
A Well, we submitted a draft report for the facility to plan, and I believe I gave that to you directly. And then we submitted this as the

Substantial Harm Criteria at a later date.
Q When you mention the consolidated plan, just so we're all on the same page, I'm going to ask you to look at CX17 and can you tell me if that's the plan you're referring to?
A Yes.
Q Yes, it is?
A Yes.
Q And that was prepared chiefly by you?
A Yes, in combination with our office and our engineers.
Q And your engineers?
A Lee Delano, yes. Lee Delano.
Q And is he in the courtroom today?
A Yes.
Q And he, he assisted you on this project or I don't want to say assisted, he's worked with you side-by-side on this project these last several years?
A Yes. I'll handle sort of the written and text portions, and then he'll handle some of the more technical stuff, if that's needed.
Q And I just kind of -- it's probably obvious, but I probably need to ask it, you've been to the West Sacramento plant personally?
A Yes.

Q And if you had to estimate how many times you've been there, what would that estimate be?
A Well, I initially started going to that site in 2006, so probably well over 30 times at this point.
Q Okay. So you feel pretty familiar with this site?
A Yes.
Q And we'll ask Mr. Delano when he testifies, but just so we don't keep anybody hanging, do you -- are you aware that he's also visited the site?
A Yes.
Q So did there come a time where you were informed or you developed an understanding that EPA was perhaps of a different view than the view you expressed earlier that a modified FRP would be satisfactory or what -- did you -- did you ever get any feedback on -- well, first, let me ask you did you get any feedback on your modified FRP?
A No.
Q What was the next thing you heard as far as where EPA was with the FRP, if you recall?
A It was in the September 2016 inspection, where I had a brief conversation with Janice about that.
Q That's Ms. Witul?

A Yes. And it was -- it was maybe just a couple comments back and forth and the only thing she said was we didn't understand what you were submitting, essentially, and we were -- so that was the first indication that we -- you know, that what we had presented was not acceptable by her standards.
Q And when you say we didn't understand, did you mean Janice Witul was saying that on behalf of EPA?
A Yes.
Q The EPA didn't understand the approach you had taken?
A Yes.
Q And did she follow up then and say why don't you do this or why don't you do that or anything? Or what feedback did you get?
A No, the feedback we got was on the inspection report just after that where it may have been given at the conclusion of the inspection where she noted there was no FRP. So at that point, Randy said, "Let's just do a full FRP and get into compliance with this."
Q And then so that was -- if I told you the date of that was somewhere in the September 2016 range, does that sound about right?

A Yes.
Q So based on those instructions, so let me back up. So you had submitted a plan -- or not a plan, I guess an analysis of the FRP in 2015 that you -- that was entitled, "Substantial Harm Criteria."
A Yes.
Q Okay. And we will look at that in a minute or two, but I, I would just like your best testimony from the date of that plan, which is June 23, 2015 and when you encountered Ms. Witul at the site inspection in September of 2016, so that year-plus, did you have any feedback or any response from EPA that you were aware of?
A Not to my knowledge.
Q Okay. Rewriting the FRP?
A No.
Q Okay. So you were -- I gather you were present at the September 2016 inspection?
A Correct.
Q And I think you testified that thereafter, you were instructed by Mr. Tilford to follow up, and what did he tell you to do?
A To make the corrections that were listed in the -- in the inspection report, the SPCC and then just in preparation for the FRP.

Q And if you look at CX17, if you would, for a moment, at Page 107 of 131.
A Yes.
Q Do you -- do you have that before you?
A Yeah.
Q And what is that -- what is that -- is that a diagram?
A Yes.
Q And what does it purport to show?
A Well, this is actually a diagram out of Craig Fletcher's report that indicates all the tanks and their locations.
Q So was this -- so this document was provided to you by Mr. Fletcher?
A Correct.
Q Do you -- is there anything in the document that differs from your familiarity with the site in terms of tank layout?
A No.
Q Or other site conditions?
A No.
Q Appears to be correct?
A Appears to be correct, yeah.
Q Let me draw your attention to the depiction of Tank 865, and what is -- where is that shown to

exist?
A Well, just -- I'm just trying to orientate myself with this map. It's at the east side of the bulk asphalt containment area.
Q And did you, earlier in this proceeding, submit a declaration explaining that there was some sort of a transpositional error with how Tank 865 was shown or how the -- how the contents were identified, do you recall that?
A Yeah. And essentially, it was not on the mapping. The mapping clearly identified the location of 865 at 881, and that was consistent. Where I made the error was in the table and it was that I took two of the tank volumes and switched them.
Q Sorry, Ms. Casey. I apologize for interrupting, but can you direct us all to the table that you're referring to?
A It's Page, Page 24.
Q Is this the page that's titled in Part 4, "Chemical Inventory"?
A Yes.
Q And what was the situation with Tank 865 that you were mentioning?
A Well, that tank, 865, should have been identified, I believe, as 880, and it got -- it was

incorrectly identified as in spill containment and it was not. It never has been.

Q Sorry, say that again, just so that everybody can recall it --

A It was -- it was misidentified on this label. It should have been 880, within that table.

Q So this table that is, if you look to the far right is demarcating tanks within the product storage and manufacturing area; is that right?

A Well, it's sort of a combination because the -- this is an accounting of all of the A/C base stock, so each tank that they have that product in, then it's, it's a list. So, so the 2.38 million-gallon tank is on this same set of tank numbers.

Q But on the -- on the far right column --

A Oh, yes, product storage unit and manufacturing area.

Q -- refers to the storage area?

A Yes.

Q Okay. So what's referred to as 865 here is -- according to this page is saying it's in the product storage manufacturing area?

A Correct.

Q And you're saying that was not actually --

A It's not. It was just an error.

Q And was the error in that it should've been Tank 880 and --

A I believe so. It was -- it was the -- yes, I believe so.

Q And was that error rectified by you some time thereafter?

A Yes. So this plan was just submitted as a draft and we subsequently issued a plan to the site some time in early of 2015, and that had been corrected in that site plan.

Q So this plan, which is dated October 24th of 2014, you said it was submitted as a draft to whom?

A To EPA.

Q And why was it submitted as a draft to EPA?

A Because it contained some of these elements of the FRP, and we were trying to get some feedback.

Q And did you get any feedback from EPA?

A No.

Q Again, before the -- before the inspection at the end of 2016?

A Yeah, no.

Q So what prompted your decision then to go ahead and issue a plan in January 2015, two or three months later, after this?

A Well, because we -- we had done all of this

work, and we needed to issue it to the site, and so we, we needed to finalize that and, and submit it to the facility.

Q So your understanding at the time was you submitted a draft to EPA to get their comments, didn't hear back, and then went ahead and finalized to the site with them?

A Correct.

Q And I'd like to ask you the same question -- couple of questions I asked Mr. Tilford, you may have heard, so I apologize for repeating, but there were documents that were produced in this litigation that included CX12 and CX24, these are -- they were both entitled FRP Checklist. One was from January; one from September of 2017?

A Yes.

Q And my question is before this -- you know, the documents that were produced in the last year or so in this case, had you ever seen those before?

A The January 2017, yes.

Q That one you saw?

A Yes, but the --

Q Okay.

A -- the subsequent one, not until --

Q So when you got -- so when you saw the

January of '17, how was that -- do you recall how that was transmitted to you?

A Randy must've provided me a copy or I was on the CC list.

Q And what did -- what did you -- so once you got that, what was your understanding of what you were supposed to do with it?

A Make corrections to the plan.

Q Make corrections to respond to that?

A Yeah.

Q And did you do that?

A Yes.

Q To the best of your ability?

A Yes.

Q And what did that result in?

A We reissued an FRP in May of '17 and submitted that.

Q And as far as you were concerned, that was a final and compliant FRP?

A To my -- to my knowledge, yes.

Q So until you saw the September of '17 comments where some deficiencies were noted by Ms. Witul, you didn't see that in September of '17?

A That -- not until this case, no.

Q You only saw it once this case had been

started and people were exchanging documents?
A Correct.
Q And had you seen it in September of '17, what would you have done?
A We would've responded to, to whatever the comments were.
Q Let me ask you to take a look at CX23. Do you have that before you, Ms. Casey?
A Yes.
Q What is this document?
A This is a Substantial Harm Criteria determination that we prepared.
Q And you were -- you were involved in the preparation of this document?
A Correct.
Q As was Mr. Delano, I gather, from the first page?
A Correct.
Q And once again, why were you -- what's your best recollection or understanding of why you were being asked to prepare this by VSS?
A To clarify questions surrounding the applicability requirements, I have a hard time saying that word, yeah.
Q In preparation of this plan, were there

specific site conditions that you, meaning you, WHF, were aware of that you tried to incorporate into this document?
A I'm sorry, can you repeat that?
Q Well, specific site conditions meaning the specific layout that you were familiar with or the -- you know, things like the topography, I think you mentioned you all had done the survey?
A Yes.
Q So to the best of your knowledge, does this document reflect the most accurate information that you have available to you?
A Yes.
Q Regarding the site layout?
A Yes.
Q And that would include drainage patterns and topography?
A Correct.
Q Okay. And what -- we have a -- we have a -- we've had a lot of testimony about the substantial harm criteria, and I'll at least make an effort not to have us all go through it again, but in general, what's your just sort of basic understanding of how the part -- the 40 CFR Part 112.20 FRP regulations are to be used at a site like VSS? What do you -- what do

you -- what are you looking -- what are you looking to -- what questions are you looking to answer in this context?
A So in the regs, there's four basic questions you have to answer, whether or not the facility, I believe, stores over 42,000 gallons and transports over water, which doesn't apply to this facility.
Q That's F1 --
A Just one of the questions, yeah.
Q -- A?
A Yes.
Q And that does not apply?
A Right.
Q Okay.
A The next --
Q Do me a -- do me a favor and jump to D.
A Oh, well, then there's the question of fish-sensitive environment, which is in proximity to fish-sensitive environmental and drinking water intake. And then where you've had a spill over 10,000 gallons within a certain time frame or -- and then the last question is, is there adequate secondary spill containment. So we have to answer those basic questions and then if this -- and then that gets you into the planning calculations.

Q Okay. So I, I think what you were -- you were saying, and I apologize, I cut you off, was two of the -- two of the four, seemingly everybody agrees, do not apply. That's the public drinking water intake and the spill history?
A Correct.
Q So that just leaves on the table for purposes of this proceeding, B & C, B being the secondary containment factor and C being the substantial harm?
MR. HELMLINGER: Again, I object to the mischaracterization of the record. I'm not sure everyone does agree that the drinking water doesn't apply. It hasn't been analyzed in this case because it's about a -- maybe a fifth-level review, but I wouldn't say we agree, it doesn't apply.
JUDGE BIRO: It's not at issue in this proceeding, just move on.
MR. MCNEIL: I certainly stand corrected. In any event, I'm only going to address B and C. So as far as B goes, did you -- did you look at that -- this is a secondary containment. What's your -- what's your understanding of what that requirement is in general?
THE WITNESS: It was -- a lot of times in

California it's applied as 110 percent of the max tank. Well, but I do understand that in some, some instances, you do use a 24-hour rain event or whatever that -- whatever that 25-year, 24-hour rain event to calculate that. But typically, in most SPCCs, the applications, we just use 110 percent of the largest tank volume.

BY MR. MCNEIL:

Q And did you reach a conclusion that that prong of F1 that, that is the lack of adequate secondary containment was not the case here?

A Correct.

Q And what did you review to arrive at that conclusion?

A We just -- we looked at -- as a whole, we looked at the secondary containment calculations and they -- there's been a couple iterations of that, and we did some of our own calculations.

Q And then insofar as Subsection C, the substantial harm criteria, what did you -- what was your approach in analyzing the potential applicability of the FRP requirements vis-a-vis substantial harm?

A Well, we went through those questions and then -- and then mostly focused on the overland flow because that way follows the biggest questions as to

whether overland flow could really get to the channel. And then also, we -- if the storm drain connection, whether the type of material affects the weight of that would flow into the storm drain. So I was looking at those, B2 as the -- I believe the storm drain calculation -- I think D1 is where storm and overland flow calculation.

(Simultaneous discussion.)

MR. LUDWIG: Would it help --

THE WITNESS: Yeah, or do you -- D -- yeah, D1 and D4 are really dealing with overland flow.

BY MR. MCNEIL:

Q I was going to ask you about that other one first, so the overland flow, what was your approach to whether that was applicable in this case?

A We looked at some modeling applications and then -- and then direct parameters and created our own model.

Q And what was the information that you used for --

A That was the Guo, Guo study is what we -- is what we used.

Q And what did you use as your -- as your inputs or your values for -- so you followed that model?

A Correct.

Q So -- and were you here for Mr. Michaud's testimony?

A Yes.

Q So you wouldn't disagree that that model is appropriate for this analysis, right?

A No.

Q So did you -- in the review of that model, did you reach a conclusion whether the model, the Guo model could also be used for the initial splash?

A I believe so because the model itself is modeling the tank break and, and inflow from the tank. So I don't -- I think it would be an appropriate assumption to use that model.

Q And then did you -- did you -- what else did you consider? Did you consider site topography?

A Yes.

Q And is that -- is that shown -- now is that depicted in any figures to CX23 that you can refer us to?

A Yes. So we have Figure 5.

Q All right. And what is Figure 5?

A It shows the overall site topography, but then also outlines topography within that scope of containment.

Q And did you -- in your analysis, did you reach -- again, we certainly can, with Your Honor's permission maybe we can pull it out, but you're generally familiar with Section 5.0, overland transport, in the appendix to Section 12?

A Yes.

Q And the witnesses have talked about that already. Is it your understanding that that allows the facility owner to do a calculation, but you're allowed to, and I'm just asking is this your understanding of it, allowed to include or take credit for manmade depressions, but you're not allowed to take credit for secondary containment?

A Correct.

Q Is that fair?

A Correct.

Q Okay. That's your understanding?

A Yes.

Q Is that how you applied that here?

A Yes.

Q Okay. So do you have a calculation for the effect on the volume of material in the event of a release or do you have any calculations that would show the impact of the manmade depression around the tanks?

A Yeah, we have a couple things that go to that point. So what the first is, it's on Page 29 is -- it gives the description of the depression of this, the containment structure, well, part of it is subsurface, so we would consider that a manmade depression because it's a point where the containment won't fail.

Q And you said Page 29?

A Yes.

Q Of 41, okay. And then what's the other -- you said there was another reference.

A And then -- can't see it --

Q Oh, I'm sorry, on Page 29, just going back to that for a second, is this figure that's included in the bottom half of Page 29, is that essentially the same as Figure 5?

A Yes, it's just inlaid into the topography map, yeah.

Q And then what was your analysis of the potential applicability of the other factor that you looked at involving the potential migration and direction of storm drains or catch basins?

A Well, we looked at the overall site topography, so where, you know, the general topography would be, which would be in the northerly direction,

and then towards the facility storm drains. And then we looked at that volume and the volume of, you know, some of the containment structures that are there, the rail -- the rail and, and actually the product and storage, I believe that was sort of accounted for, too, because that's also low-grade.

Q And what was your conclusion regarding the reasonable expectation or whether there was a reasonable expectation that a release would reach the channel via either of those routes?

A Well, we -- I think we demonstrated in our model that it was a relatively low possibility because the material cools so quickly, we, we take some pretty conservative estimates of how that material will initially travel, and when you sort of knock down -- when you sort of assume that that initial wave is contained and then you take out that snow (phonetic) volume and account for the slope, you would -- you would get where it just really doesn't go as -- it doesn't go, you know, past that southern boundary when you take, take into account the slope changes.

Q Meaning the uphill slope at the southerly side?

A Correct.

MR. MCNEIL: I have nothing further at this

time, Your Honor.

JUDGE BIRO: Okay. Do you want to proceed with cross?

MR. HELMLINGER: Could we take five minutes before I start?

JUDGE BIRO: Sure.

MR. HELMLINGER: I should be able to finish before 5:00.

JUDGE BIRO: Okay.

(Whereupon, a brief recess was taken.)

JUDGE BIRO: Madam Reporter, we're going to go back on the record. Please proceed.

CROSS-EXAMINATION

BY MR. HELMLINGER:

Q Hello, Ms. Casey.

A Hey.

Q So your testimony was that you have done a bit of work with SPCC plans, air permitting, hazmat work. You understand that the state Above Ground Petroleum Storage Act is different than the federal SPCC department's, do you not?

A Yes.

Q And the hazmat work, you're working with the DTSC, the Department of Toxic Substances Control, which is a state agency, that's correct?

A Correct.

Q And that when you discussed the regional water boards, that's a state -- California State Water Regulation Agency?

A Correct.

Q Principally for ground water and surface water. You mentioned that you had had some involvement with EPA. Could you describe if that regards SPCC or FRP?

A It was an -- it was an SPCC.

Q And which site was that?

A What's that?

Q Which site was that?

A It was a site in Tuolumne County.

Q In Tuolumne County?

A Yes.

Q Do you know the name of the facility?

A Yes, it's the George Reed Rock Quarry.

Q Now was that an SPCC or FRP issue?

A SPCC.

Q And just the one?

A Yeah, and I think the other EPA thing was sort of a different issue, not SPCC-related.

Q When you're working with the state agencies, have you been involved in enforcement actions related

to the work that you've been involved with?
A Yes.
Q And are you brought into those matters after the agency has identified potential violations?
A Depends on the client.
Q Let's say that you have been brought into a situation after an agency has notified the client of potential violations, have you understood the agencies to accept iterations of permits, for example, efforts of compliance?
A I think if the -- if the general effort is towards compliance, there's, there's been a willingness to, to accept.
Q Sure. We can all agree, compliance is, is a goal across the board.
A Yeah.
Q But does that change -- has that, in your experience, have you ever seen in writing from an agency that changed the nature of the original violation allegation?
A Yeah.
Q You've seen that in writing?
A Uh-huh.
Q For what sites?
A I mean specifically. I mean I, I've seen

where in our response has changed a violation order is, is adding information or giving more information changes the response from the agency.
Q In those instances, is that changing the facts, the understanding that the agency might have? Or is that sort of coming into compliance? You're telling me -- one question at a time.
(Simultaneous discussion.)
Q Let me back up, so it's clear for the record, one question at a time. Is it your understanding that providing maybe better facts to the agency has changed an agency's assertion of a violation?
A Or a clarification on regulation, yes.
Q Or a clarification on regulation, so if the agency would agree it had a misinterpretation of a regulation that, that might change the posture of the violation, that's been your experience?
A Yes.
Q If there is no misunderstanding of the regulation or there is no clarification or improvement of facts, has subsequent compliance been conveyed to you or your clients in writing that the original violation didn't occur?
A Well, it's usually negated by whatever was

submitted.
Q Negated or resolved, which is a better word?
A Resolved, probably.
Q I'd like to have you turn to RX23, if you would.
THE WITNESS: What was the number?
JUDGE BIRO: 23.
THE WITNESS: Is that in the black book?
JUDGE BIRO: In the black volume, it's the last one in the first volume.
THE WITNESS: Okay.
BY MR. HELMLINGER:
Q It's a big document. If you would turn to Page 78 of RX23. Can you take a moment and familiarize yourself with this?
A Yes.
Q Can you tell me if you recognize this? Have you seen this document?
A Yes.
Q What is it?
A This is the checklist from the January 17 FRP checklist.
Q And this is what you used when you made another effort at improving the FRP plan, is that right?

A Correct.
Q I'd have you turn to the second page of the document. Could you review this and identify, if you can, what it is?
A This particular page?
Q And this document, yes.
A I don't understand what you're asking me to do.
Q Page 2 of 147, do you have that in front of you?
JUDGE BIRO: Page 2 of 147?
MR. HELMLINGER: Yes.
JUDGE BIRO: Oh.
MR. HELMLINGER: This is one of those documents that's really kind of many documents conflated.
THE WITNESS: Okay.
BY MR. HELMLINGER:
Q Do you see the top right corner of this document, the date?
A Yes.
Q And what is that date?
A March 27, 2017.
Q And is this letter addressed to Mr. Jeffrey Reed?

A Correct.
Q At the VSS facility in West Sacramento?
A Yes.
Q And does this document transmit the FRP checklist to the VSS facility?
A I assume so, yes.
Q So given your work with SPCC plans, can I assume you're familiar with the phrase 'crosswalk'?
A Sure.
Q Okay. Are you familiar with the phrase 'crosswalk'?
A Well, I understand what you're saying, yes.
Q Sure. So you understand there's requirements in the SPCC regulations to essentially crosswalk the requirements. If you don't provide your SPCC plan in the same order and format suggested by the federal regulations, that you provide a crosswalk.
A Right. We call that a cross-reference table.
Q Okay. A cross-reference table. Have you prepared a cross-reference table among the several iterations of compliance documents between 2015 and 2017?
A Yes.
Q You have?

A Yes.
Q Have you submitted that to EPA?
A It's in all of our plans, correct.
Q There's a crosswalk between the different documents?
A Well, the FRP and SPCC are standalone documents.
Q Well, if I understood the testimony correctly, there were a couple graphs that combined SPCC and FRP, ultimately culminated in May 2017 with an FRP plan, and along the way there, there were, I think you used the phrase 'graphs', there was testimony earlier that whichever one we had, I think was the quote, was the applicable plan. The plans had different materials then, isn't that right?
A Well, there's -- yeah, because they're -- they -- they're a document that continues to be modified over time, so there's different versions of that document, yes.
Q Each subsequent iteration didn't include the same information the previous draft did; isn't that right?
A Well, correct.
Q Some of the preceding documents included information that didn't transmit forward into the later documents, such as an emergency response plan; isn't that right?

A I'm not exactly following what you're asking me.
Q If there was an emergency response plan in a 2014 document that did not appear in a 2015 document, was there any crosswalk or cross-reference that suggested if you're looking at the 2015 plan that one should go to the 2014 plan to find that piece of information?
A Well, do we -- do we refer back to old plans in that cross-reference section?
Q If you want to take the question that way, that's fine with me.
A I don't -- I don't -- if, if that's your question, then no, we don't -- we don't go back to previous plans.
Q Thank you. When you were at the meeting in 2014, you mentioned I was there, did you have any understanding that the EPA did not believe there were violations at the VSS facility, both of SPCC and FRP regulations?
A Well, I think it was -- there was a -- I mean the -- with the SPCC, I think there was a clear understanding of that. The FRP, to me, seemed like kind of an open-ended question. There was -- there was discussion about that, that it seemed like that was still sort of an unanswered question.
Q So it's your testimony that EPA brought you to San Francisco to discuss potential FRP violations, but you don't think FRP -- EPA believed there would ever be violations on that day?
A I hadn't seen any specific mention of what they -- of the violations. I mean I came to that meeting, I, I hadn't, you know, reviewed any document that said there were specific violations regarding that.
Q Were you told that day that EPA had concerns that there were FRP violations at that facility?
A Well, of course, that was a part of the conversation, but the conclusion of that conversation seemed like it left it open-ended, in my opinion.
Q You prepared CX23. I'd like to have you turn to that. If I could have you turn to Page 10 of that document. Do you have that in front of you?
A Yes.
Q Table 4 on that page has your summary of initial waves. This is a wave calculation that you testified you produced following the Guo model; is that right?

A Correct.
Q And you have the total tank volume, 2,348,000 gallons. I believe the report states that that would be the absolute worst discharge, the maximum volume of a single tank?
A Correct.
Q And your report also states that the absolute worst case discharge would be a side seam split of that tank; is that right?
A Correct.
Q You go through here, if I'm understanding this right, you are saying that in line -- contained on site, the third line down, that Table 4, 1,400,000 gallons, you're saying, wouldn't escape containment, essentially. That is what you had said, I believe, would be trapped in the manmade depression. Do I have that testimony correct; is that right?
A Well, on this -- in this table, the initial 1.4 million is contained within that manmade depression, and then the 948 is what escapes that, correct.
Q Right. And so when you say manmade depressions, to me, if we look at RX105 on the wall here, that's this -- what was -- testimony was the wedge shape where you come up to reach the containment

berm; is that right? The sort of slope?
A There's no right or -- that's not an accurate depiction of the site.
Q Sure, this -- I agree, this does not include the second-hand containment. Maybe I could turn you to one of the maps of the facility. Okay. So I have CX1 up, which we have had a lot of discussion of this aerial photo of the site. We see the two white tanks and plenty of testimony that those are the large asphalt cement tanks. One of those is the 2,348,000-gallon tanks that you're doing your math based on; is that right?
A Yes.
Q And sort of a rectangle at the bottom left corner, the corner is cut off. That's what we know as the secondary containment wall; is that right?
A Correct.
Q And within that is what you're calling the manmade depression; is that right?
A Yes, but a, a portion of it is underground, is below grade.
Q I understand. It's, it's graded down towards the tanks at a lower elevation than the, the property immediately south of that wall?
A Well, there's literally a approximately 1.9-

foot depression --
Q Yes, I understand that.
A -- that, that extends the -- like below the containment wall.
Q Yes, I understand that. Just, just to be fair, so you call it a manmade depression, calling this the area of secondary containment I think is not exactly relevant to my question to be too particular on that.
A Okay.
Q So but you're saying that that 1,400,000 gallons would be captured there?
A Correct.
Q You are saying that you're only doing your wave height calculation based on 948,000 gallons, that's correct?
A Correct.
Q So I just want to understand this right because math is difficult. The difference -- you're saying that 1,400,000 gallons would not be subject to gravity or momentum under the Guo model?
A What we're saying is, is that we're -- in this first initial, we're trying to, to model that initial wave. So there's this instantaneous sort of thing that we assumed that it breaks, it fills up that

1.9 feet, and the wave coming over is what we're calculating here at .57.
Q Sure.
A And then that volume that comes over is related to the 948,000.
Q So the wave is, in fact, higher than you calculated? You're saying that gravity and momentum do apply to that 1,400,000 gallons?
A We're assuming -- we're assuming in this that this wave height is going to apply outside, even though in reality, that would be knocked down. We're just -- we're just making an assumption here that, that this is -- since we're trying to calculate this in worst case, that we're, we're reducing the volume of the spill but not the wave itself.
Q Right. So you're only calculating the wave based on the smaller volume of the rules?
A No, no, no, incorrect. The wave is calculated based on the full volume. It's just that the volume is then reduced by the 1.4 million gallons, I believe, if I understand your question, that's my understanding.
Q I'm going to turn you to the -- lower down, the spill angle line. Do you see that? The spill angle, 360 degrees.

A Correct.
Q So we're assuming that your initial splash is based on a testimony earlier, a tank column collapse, full 360-degree positive containment.
A Yeah, it would be similar in this case.
Q What would be similar in this case?
A The 360-degree angle.
Q Right. So that's how you're calculating this, this is the whole tank collapse?
A Right.
Q So this is not based on a 180-degree collapse or a quarter-tank collapse?
A Well, for the initial phase, we were using 360, but then when you try to do a total distance, then we're limiting that to a 45-degree angle.
Q Sure. My question is just about this initial phase.
A Okay.
Q So you've only done this characterization based on a full tank collapse --
A Right.
Q -- 360 degrees?
A Yeah.
Q And the distance to travel here is 271 feet-plus sign, do I have that right?

A Well, that's sort of an assumed value in the model. The final radius of travel is an assumed value to, to calculate this, we calculate the wave height.
Q And why do you assume that height?
A I'd have to go back to the model and look at the parameters, but you have to assume some distance, and that's, that's the average property boundary.
Q Right. So at -- based on your assumption, at 271 feet, you're saying the wave height is a little more than half a foot, .57 feet?
A Well, no, that's not the -- in this particular case, the final radius of travel is really not -- we're not saying that that's the -- that that's the extent of this phase. We're just using -- it's an iterative model, so then we're using what we're developing in this to put into the second phase. So the final radius or final distance is in the next calculation.
Q All right. And so at 271 feet, the model calculates it would reach that distance in 21 seconds, .99?
A Correct.
Q You testified that the asphalt would cool so quickly I think was the quote. Would it cool in 21 seconds?

A No, that's, that's why we assume time -- that's why we assume that instantaneous --
Q Sure. Would it cool from 250 degrees to 150 degrees in 30 minutes?
A Well, I think that we have a table that explains the flow rate. So this -- we have Graph 2 here where it starts at 300 in a 60-minute interval, it's cooling to I think about 180 or --
Q Right. So in 30 minutes, it won't cool to 150 degrees; is that right?
A Right.
Q Have you been to many oil spill responses?
A Yes.
Q How many?
A More than 20.
Q Are these are what you might characterize as a large spill? And if so, please describe what large means to you.
A Well, large is really relative to where the spill happens, so I mean I, I've had small spills in a storm drain and they're a serious issue. I've had large spills, so basically in an open area and they -- and they're not a problem, so --
Q Sure. So we can appreciate that risk from a spill changes based on certain circumstances, right?

A Right.
Q So given that, is it your conclusion that a potential 200 million-gallon asphalt spill, 200 feet from the Sacramento River Deep Water Ship Channel is not a risk?
A I think the way that we modeled it, it shows that it doesn't leave that back boundary, and it cools and --
Q Right. And when you say back boundary, you mean the property north of the tanks?
A The southern -- the southern boundary.
Q Right. So you didn't model the flow moving to the south, did you?
A Well, the site -- the site model takes into account the slope, so yes, it would.
Q Are these slopes intended to capture the gravity and momentum of a 2,000,0000-gallon asphalt tank collapse?
A Well, the model itself does. I mean the Guo model itself does.
Q But you testified based on your experience as an SPCC engineer --
A Oh, I'm not an engineer, but --
Q But you've produced many SPCC plans?
A Yes.

Q Okay. So you also testified that you've done a lot of storm water work.
A Yes.
Q So you understand storm water drainage very well.
A Yes.
Q Right. Would you agree with me this facility is really designed to channel storm water towards the north facility?
A Correct.
Q Is this facility designed to capture or deflect a 2,000,000-gallon asphaltic cement discharge exclusively to the north?
A From when our report --
(Simultaneous discussion.)
Q And that's the only circumstance you can envision? It's only going to flow to the north? Is that your testimony?
A No, but if it flows across the side, but it's dictated by the topography at some point, so we try to model where it initially goes and then where it goes after that and if it's going to follow the direction of storm water.
Q And you had testified you applied the Guo model to the initial splash, and have you reviewed the

Roche model?
A Yes.
Q And have you applied the Roche model?
A No. Because the Roche model doesn't really have a model created within it.
Q So you haven't applied any of the formulations or considerations of the Roche paper?
A I've looked at them, but I -- but no.
Q Your testimony or your -- I'm sorry, not your testimony, CX23, your report mentions that you only have to model a portion of the worst case discharge; is that right?
A Correct.
Q And what portion is that?
A Well, that's what it says in the regulation. That's what's ambiguous.
Q Is it really? I'll read this to you from 5.1 of Appendix C and you can tell me if this is what you believe is ambiguous. "The owner or operator must evaluate the likelihood where portions of a worst-case discharge would reach navigable waters via open channel flow or from sheet flow across the land or be prevented from reaching navigable waters when trapped in natural manmade depressions, excluding secondary containment structures." So you believe it's

ambiguous that the word 'portions' there doesn't modify worst-case discharge reaching navigable waters?
A Well --
MR. MCNEIL: Objection, Your Honor, this calls for a legal conclusion.
MR. HELMLINGER: She told me she was confused by it, and I need to understand this because it clearly weighs into the application of the FRP.
JUDGE BIRO: Well, she's an expert. This is the ground, something she should know. Go ahead. Overruled.
THE WITNESS: Well, I believe -- I mean it's -- the way that it's written, it implies that a portion, you're only -- you're only -- even a worst-case discharge a portion of it gets there, not --
MR. HELMLINGER: Agreed, agreed.
THE WITNESS: Right, yeah.
MR. HELMLINGER: The consideration really is that you're planning for a worst-case discharge because a portion may have reached the navigable water. You're not planning for a portion of a worst-case discharge and how that would follow. Is that fair?
THE WITNESS: Okay.
BY MR. HELMLINGER:

Q Do you agree with me?
A Yeah.
Q In your report, you refer to a manmade berm on the southern edge of the property. Is that what has been described in the earlier testimony today as the K rails and Jersey walls?
A Yeah, yeah.
Q And have you reviewed any engineering designs on those K rails or Jersey walls?
A No.
Q Do you understand them to be impervious?
A Well, I do -- I mean I do understand that there was a dirt berm on the other side of it for a period of time that I observed. And subsequent, they have completed that and, and from my understanding sealed that.
Q So it's containable?
A Well, it's divergent.
Q Divergent. Is divergent and containable different?
A In this instance, yes.
Q How so?
A Because containable implies that you're trying to contain the volume of a particular tank, where divergent means that you're trying to divert

whatever might reach that, whether it be water or a spill.
Q Is that, in your mind, a difference -- you testified that you have experience creating SPCC plans.
A Correct.
Q Do you understand that SPCC can take many different forms because it's not prescriptive; is that right?
A Correct.
Q It leaves it to the facility to design containment structures?
A Correct.
Q Right. So if the first wall -- and you understand that the FRP calculations don't allow you to include a secondary tank, would you agree on that?
A Yes.
Q All right. So if you don't have the wall in CX1 here that makes that rectangle around the two tanks, would the southern boundary contain any release in the facility, these K rails?
A We don't -- we don't -- well, are you -- so you're calling that a containment wall?
Q Well, I'm asking if you're calling it a containment wall.

A No, I'm not calling it a containment wall.
Q All right. Do you believe that that is something that would stop flow of oil?
A Yes.
Q Is it itself a depression?
A No.
Q In your report, you note that storm drains exist in the facility, correct?
A Correct.
Q And in your report, you note that the route of any discharge through a storm drain would go to the Sacramento Deep Water Ship Channel; is that correct?
A Right.
Q And you note that that would take approximately 2,490 feet distance to the storm drain; is that correct?
A No, I have to look at that. What page are you on?
Q This is on Page 10.
A Where -- I don't -- I don't -- I'm not sure where you're referring?
Q I'm sorry, I think I gave a wrong page reference there. I shouldn't be making notes on the fly. On Page 12. Do you see in the last paragraph there, it begins, "The discharge point," can you read

that?
A Correct.
Q Does that refresh your recollection as to the distance the storm drain runs where the water reaches the Sacramento Deep Water Ship Channel?
A Yes, correct.
Q I don't believe it matters, but 2,490 feet is less than a half-mile, is it not?
A Okay, sure.
Q And the facility itself, these two large tanks are within a half-mile of Sacramento's Deep Water Ship Channel, is it not?
A Yes.
MR. HELMLINGER: No more questions.
MR. MCNEIL: No redirect, Your Honor.
BY JUDGE BIRO:
Q Can I just ask you a few questions? Can you -- you said you did 30 SPCC reports.
A Correct.
Q How many FRP reports have you done?
A This is the first FRP I've done, yes.
Q And did your calculations take into account the ambient temperature or the temperature of the land?
A Yes, it's built into the model.

Q And what temperature did you end up using?
A I can't -- I can't be totally sure. I think it's 70 degrees -- yeah, it's in there.
Q Was it the worst-case scenario?
A Well, but it's just a parameter I modeled considering an average ambient temperature.
Q And if it turned out that there wasn't an initial 360-degree collapse, if instead, it collapsed on one side of the seam, would that, in fact, overflow the boundary, the depression and flow towards the water quicker because it wouldn't -- the value wouldn't have a greater area to expand to?
A Well --
Q Do you understand my question?
A Yeah, I understand what you're saying, and strictly speaking, yes, because the angle that that tank raised can dictate the flow, so if you're doing it at 45, which is, in this case, I think presumed to be the worst case scenario, then that material flows out, but what I think restricts it in this case is because you have this depression that that material can't escape. So it has to overflow that first and then you're -- and then you're assuming that the other containment wall isn't there, which is what the FRP requires you to design the model, but so you're really

sort of even creating a 360 in this particular case because it sort of over -- because it fills up and overflows --

Q So you --

A -- it fills up and overflows --

Q -- think it would have to fill -- the asphalt cement would have to fill all of the area around to be --

A To be --

Q -- so if it cracked on the seam on the south side, it would flow and evenly fill up all of the depression area before it flew -- it went over the barrier?

A Well, that particular instance would have to be modeled specifically because then you're, you're really determining that wave height. So if that wave like, you know, gets over all of the wall and then the topography and then this barrier in the back, then it, it could potentially. It's just whether that really actually happens within that tank break and if that's realistic to assume. So --

Q Okay. So what happens to everything else? Let's say there is a catastrophic failure and 2.4 million gallons of asphalt, hot asphalt leak out, what happens to the other tanks that are there. Now,

another large tank and there's another smaller tank onsite?

A I don't believe that -- I mean it could cause damage to those tanks, but I don't -- I don't believe on the same level.

Q They wouldn't call a breach?

A I don't -- I wouldn't know for sure.

Q Okay. And you said that you thought that a modified FRP would be acceptable in this case, is that --

A Well, that was my understanding after the meeting was that we would, you know, work on sort of systematically trying to put this together. So if we were going to, you know, do the FRP or we going to do the SPCC, that was our first iteration of that plan, and then we were going to try to address, you know, some of the, the conditions of the FRP, and so to work towards that.

Q So you were -- I'm still confused by this whole modified or, you know --

A It was presented as an -- as an idea because we do these things on all these plans, and this is not a typical plan. They're not typically recorded like this. We do -- we try to consolidate -- allow different emergency response and contingency plans

sort of in one document, so we -- the idea was still -- I mentioned that, you know, this is what we do, and I think that they, it was my understanding from the feedback I got was maybe that would work, so that was --

Q Maybe that would meet their --

A -- that let's put that in and we'll see what -- we'll be able to see.

Q So that's the impression you got --

A That was --

Q -- EPA said put in what you normally do and we'll see if that's sufficient?

A That's the impression I got from the meeting, yes.

Q Okay. All right. Did you confirm that with EPA in writing, that that's what you were doing, you weren't going to do a whole separate FRP, but you were going to put together your normal consolidated plan?

A I didn't put -- I did not, no.

JUDGE BIRO: All right. Did my questions raise any questions?

MR. MCNEIL: No, Your Honor.

MR. HELMLINGER: I have two, Your Honor, if I may.

JUDGE BIRO: Of course, come on.

MR. HELMLINGER: I'm sorry. I'm sorry.

RECROSS-EXAMINATION

BY MR. HELMLINGER:

Q I'm curious about this understanding. If you understood that a hybrid SPCC or modified SPCC would be appropriate, I don't understand -- could you explain how information and even your higher plan, how might it have satisfied if you did a standalone FRP that would be incomplete?

A Well, we were looking at the -- we were looking at some of the -- I mean I'm -- we were looking at some of the contingency plan stuff, and we felt like we had some of the flow analysis covered in the SPCC and then we were trying to develop some training, additional training requirements, although that was still submitted sort of in this draft document.

Q Sure. And if I understood right, this is your first effort at preparing an FRP in 2014?

A Yes.

Q I have one other question. The discussion about your testimony was certain spill scenarios aren't realistic, and so you've discounted them.

A Well, I don't know if that's --

Q Do you understand the FRP or SPCC

regulations to require you to model potential spills based on what's realistic?

A Well, potential, I don't -- I don't think I'd use that specific term.

Q Well, the regulations, the way they describe worst-case discharge, they actually limit you to just one tank; isn't that right?

A Well, the max tank volume, correct.

Q Right, a single tank.

A Yeah.

Q But in a real sort of realistic worst case, like a 6.5 or 7 earthquake, is one tank really realistic?

A It could be, yeah. I mean --

Q It could be, but realistic, it could also be a southern flow towards the Sacramento River Deep Water Ship Channel then, couldn't it?

A Well, well, are you with or without slope containment? That's the question because in the FRP, we can't account for that --

Q Exactly.

A -- and so any --

Q That's exactly my point. So you agree with me that the FRP regulations give you a prescribed formula to apply, regardless of being realistic and

you can't just sort of choose what you'd like from that?

MR. MCNEIL: Objection, Your Honor. This is argumentative.

MR. HELMLINGER: Withdrawn.

JUDGE BIRO: Okay. All right. Can we release her? Yes, okay. Thank you very much.

THE WITNESS: Thank you.

JUDGE BIRO: Okay. It's 4:30, and I am still on East Coast Time. So we're going to stop for today. Can we pick up Monday at 9:00 a.m.? Yes. Okay. Well, have a good weekend. See you then.

MR. HELMLINGER: Do we have an idea of his order for Monday?

THE COURT REPORTER: Are we off the record?

JUDGE BIRO: Yes.

(Whereupon, at 4:37 p.m., the hearing in the above-entitled matter adjourned, to reconvene at 9:00 a.m. on Monday, May 20, 2019.)

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REPORTER'S CERTIFICATE

DOCKET NO.: OPA-09-2018-00002
CASE TITLE: VSS International, Inc.
HEARING DATE: May 17, 2019
LOCATION: San Francisco, California

I hereby certify that the proceedings and evidence are contained fully and accurately on the tapes and notes reported by me at the hearing in the above case before the United States Environmental Protection Agency, Office of Administrative Law Judges.

Date: May 17, 2019

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