HUDSON RIVER PHASE 1 DREDGING
PEER REVIEW PANEL

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## CONTENTS

Welcome and Introduction  
**Melinda Holland**, Facilitator,  
E’ Inc (Ecology and Economics)..........................4  

GE Presentation............................................4  

EPA Presentation..........................................56  

Panel Deliberations......................................109  

Peer Review Contractor Summation, Schedule Review  
and Next Steps...........................................252  

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PROCEEDINGS

Welcome and Introduction

MS. HOLLAND: So, today, we will start off with a presentation from GE and followed immediately by EPA's presentation, their wrap-up presentations. Then we will go into panel deliberations, which will continue until 3:30, when Steve Garon will give you the contractor's summing-up remarks and next steps and schedule.

I heard that GE's court reporter is in the hotel but running late. So we really need to get started. So does it work okay for you guys to go ahead and get going?

ATTENDEE: Yes.

MS. HOLLAND: All right. Thanks.

The lavaliere mic you have on, all right? You are good.

MR. HAGGARD: I do. Yes, it is on.

MS. HOLLAND: And you have the clicker?

MR. HAGGARD: Yes, I do.

MS. HOLLAND: Thank you.

GE Presentation

MR. HAGGARD: Jennifer, if the clicker doesn't work, please help me out.
Well, good morning. Good morning. I am not sure where you want me to wander around. I like wandering around.

**MS. HOLLAND:** You can wander.

**MR. HAGGARD:** Thank you. Thank you.

Good morning, and, hopefully, everybody had a nice meal here last night or somewhere in town on Cinco de Mayo.

I really appreciate the effort and probably don't completely understand how overwhelmed you might be with information and analysis, but I think I have some sense that we and I am sure EPA -- we have had to live through this massive data and try to sort it, work through it, and we have made a lot of progress on it, obviously, but it has got to be pretty daunting to sort of jump into the middle of this and try to sort things out, but, to the extent that we can continue to help along those lines, we certainly will.

Paul, I think yesterday you suggested that we would have rebuttal time. I really don't want to do rebuttals. What I would like to do today is spend really 5 to 10 minutes just summarizing where we are in the standards and the rationale for the standards and hopefully free up some time, so you guys can get to what you really probably
want to do, which is deliberation.

Listening carefully over the last few days, I will try to summarize where we are in the standards and our proposals. We have made a slight modification to one of them that we would like to talk to you about and then really talk more about the rationale.

With all the information that's out there, I think you have sensed that there are many areas where there may be some disagreement, areas where we do have some agreement with the agency, but I think when you step back, the one area we could really use some help on, where there is a disagreement over a really important issue, is related to the load and the resuspension and how much resuspension we'd get and what the right load is. So where we could use your technical expertise, experience, is to help us weigh in on some of these issues, and these go to the load and the resuspension.

The first is -- and this issue came up -- about a standard for the Upper Hudson River. The Upper Hudson River is the reason this remedy is being done, to accrue the benefits to fish in the Upper Hudson River, and yet there is not a standard being set for the Upper Hudson River.
If you look at the Lower Hudson River, you can take a look at the modeling results the agency used in back of the old Record of Decision. Really, there wasn't much of a benefit, if any benefit, for the remedy to the Lower Hudson River. Instead, there was more of a concern we really aren't going to make things worse down there, and we saw some of that in the modeling results where we can see the impacts to the fish as a result of the PCB load in the Lower River. But, again, I think we come back to we need to establish a metric, a load, a limit to protect the benefits of the Upper Hudson River.

We also have a great tool to do that, an unprecedented tool, and an opportunity here that we believe should be taken advantage of. We have a model that has been calibrated to probably the best dataset available anywhere, and that tool allows us to really do objective, informed decision-making, and it integrates a tremendous amount of information and processes that allow us to really, I think, not have to guess at things. We don't have to guess at the interaction between variables because the model takes that into account.

Trying to keep it all straight in our head, we can
only get so far, and the model is a tool that is ready to use, and we should use it to establish the loads or for the standards for both the Upper and Lower River.

Then, really an important point here is once we spend the time and effort establishing these standards, they are intended to protect the benefit of what we are trying to do and achieve a benefit for this remedy. This is a complex long-term remedy where this is very invasive.

We are going in, we are impacting the habitats, we are impacting the communities. We sure better have a benefit of what we do, and that standard needs to be that accountability that we all have, be it GE, the agency, or others, that, you know what, we will make this river better, and so we believe strongly that this standard needs to be a "not to exceed" standard, and we need to understand how that would work, but it needs to be set as a "not to exceed" standard.

We have talked about the various standards, the resuspension, and what we have been trying to do -- and I think some of this you have heard -- is to understand the relationship between these standards, really craft a set of standards that we believe will protect the benefits of the
remedy, number one, and actually that can be accomplished, they are practical, we can actually achieve these standards.

The first is on the resuspension. Again, I just mention we think it should be a firm limit. It should established both the Upper and Lower Hudson River to protect the benefits, and we should use the model to settle.

We had presented to you. John Connolly went through the analysis. So we have a limit. We think the limit should be at 1,200 kilograms, and that is based on the use of the models. That may end up having to be adjusted downward, depending on where we end up on the redeposition.

On redeposition, we are continuing to do the research work as well as the modeling runs to show what the potential impact might be as a result of redeposition.

John Connolly will talk a little bit about that after I am done, briefly on where we are in the modeling runs.

But the 1,200 should be the firm limit. That should be adopted, and then as we move forward, we need to look at how we revise it to take into account the redeposition.

Certainly.
MR. FUGLEVAND: Once again, on your 1,200 kilograms, could you just reinforce whether it's total or tri?

MR. HAGGARD: That is a total, total PCB.

And then, again, we are working on the model runs that John and his group are doing on what impact to the fish in the Upper Hudson River will receive for various ranges of PCB release, so that we can -- if you recall the graphic he had, where these lines cross and how much of the benefit can we really stand to lose in the Upper Hudson River, that is underway. We are driving those numbers, and those will be sent to you as soon as we have those.

The other point is that we need to monitor year-round. We have seen evidence for delayed releases. So drudging stops, but the PCB releases from drudging continue. We need to fully account for those, and so we think the standard should include the monitoring of the additional net load throughout the entire course of the year, and when we are doing our accounting and balancing, we need to include that, the data to decide for what we have already used up.

On the residuals approach, our approach, which we are very comfortable with, but, obviously, I think there are
some concerns on the group here about the depth of contamination -- our original approach we recognize there was uncertainty in the depth of contamination, particularly in what we call the "low-confidence areas," but we had a way we were comfortable in dealing with that. But, nonetheless, we can also go into those low-confidence areas, gather additional data prior to the drudging, and actually then turn them into high-confidence areas and redefine the DoC.

So we had proposed working with the agency to try to work to appoint where we can actually get additional data in low-confidence areas with the goal of turning them into high-confidence areas, and then we would go in, we would dredge to the design cut. We would then sample and to put appropriate cap or backfill. That is going to allow a very efficient operation.

You were having some discussions yesterday about the length of time CUs are open and the potential that would have for impacting resuspension. Based on the data we have been looking at -- and, Todd, I think you were talking about it -- it is hard to sort out all these variables, even though we have a tremendous amount of data, but you start of looking at what impact these open CUs may have had, and I
think we have in our report, it is not that significant, we
don't believe, but that is not perfect data. And what this
will do is this will allow the CUs to be closed up very
quickly, regardless of what impact they were having, and
from our standpoint, from a productivity standpoint, that's
going to be a real positive to be able to close those CUs
out very quickly.

The other part of our standards, we would have a
hard bottom, varved clay. We would stop dredging, and then
the 3 part per million, either backfill or cap.

We are in the process and will have today -- you
have asked for the table that we had redlined. We will give
you a revised table that will incorporate this before you
leave today.

Then, on productivity, we really do believe that
we need to have a project be done as quickly as possible, to
start accruing the benefits of this project as quickly as
possible, and we think the proposal actually that we have
for the combination of the load residuals and productivity
will allow this project to get done, 5 years or less.

Nonetheless, the idea of subordinating the
productivity to the other standards, we understand that
concept and would agree with it, but I think we also want to make sure that we do move quickly as reasonable to get this project done.

So, when we look at the standards, and the goal of the standards versus what we are proposing, one of the questions you all asked to address is can these standards be achieved or should there be some alternative standards.

Our standards can be achieved, what we've proposed, and these are the statements from the Record of Decision. This is what the remedy was trying to do, reduce PCB concentrations in fish, Upper Hudson in particular, reduce the concentrations in water, the bioavailable PCBs in water, and, really important, reduce the bioavailable inventory of PCBs in the sediment, and then long term, just reduce the PCB concentrations going down river.

Overall, the goal of the standards were to make sure that those benefits didn't get lost or the negative consequences of the remedy implementation. in particular, resuspension and increased PCB load loss.

Also, a very important goal was accountability, and this comes back to the idea what you really do need to be accountable here, which means we can't have fuzzy goals.
We can't say, "You know, we wanted to meet this target, but, no, we are going to change that. We can add a few more years." Well, we can add some more PCBs in the load. It needs to be an accountable standard that shouldn't be a moving target.

Now, when you look at what our remedy is going to be able to accomplish, on the concentrations in fish, again Upper Hudson River, we don't have the standard set yet. We have a concept for developing this standard that we would really like to get your feedback on and then actual numerical limits, we will give to you, but our remedy will protect the benefits to the Upper Hudson.

It will also protect the benefits in the Lower Hudson, and again the load concept for the Lower Hudson wasn't directly related to the fish because I think, as EPA showed you, the PCB levels in the fish over time, long term, with or without the remedy, weren't a whole lot different. The remedy was not having much of a positive impact on the fish.

However, the graphics we also saw indicated that the load really did protect against the shorter term increases in the fish, and so that is an important metric.
This is a risk-based metric when you start looking at PCB increases to fish caused by the load.

Our standard will allow us to minimize that impact going downstream and try to get as low as we can to the negative side, and, again, the other thing that is important on the fish we saw from modeling was the idea that impacts are all short term.

Now, what we find -- and redeposition is part of this -- is that these impacts keep going beyond the remedy implementation, and then even down at, I think it was, River Mile 50 at Poughkeepsie that the impacts continued to occur a decade after dredging stopped, and so we are still seeing elevated PCB levels a decade after dredging.

So, what should have been a 5- or a 6-year impact now turned into 15-, 16-year impact in the Lower River. So protecting the Lower River from the negative consequences of the remedy, through the load standard, we should be able -- we will be able to do that.

In the Upper River also and the Lower River, this will help reduce concentrations of PCBs in the river. When you look at the load standard for the Lower Hudson River, we will be able to, by the load, the 1,200-kilogram load -- we
will be able to keep PCB levels at a break-even point where
we will be sending after -- 20 years after the remedy, we
will have sent less PCBs down river than would have occurred
if we hadn't dredged.

So we will be able to meet that requirement to
maintain the benefits from the downstream transport and then
bioavailable inventory.

The redepositions, it's an issue that we are
dealing with, it's real, it has happened, it is going to
slow recovery. The extent of it, we are still trying to
understand, but one thing that our standards will
incorporate, the concept of redeposition, and ensure that
the bioavailable inventory doesn't increase as a result of
the redeposition of PCBs downstream. So the standards that
we are working on, both for the Upper and Lower River, will
ensure that is taken into account, and that we are not
creating more bioavailable PCBs than if we hadn't been
dredging.

On the resuspension, you look at where EPA is
right now, and we heard yesterday it's a 1-percent number,
which it is not really a standard anymore to a great extent.
The original standard, as it was described and developed,
was based on -- for the Lower River was based on use of the modeling where it was an objective look at how much PCB can we send downstream, and within a reasonable amount of time, you start seeing that the actual amount sent downstream would be much less than happened during the dredging, and so we compared to MNA.

That has really been -- that concept has been over-ridden by this 1 percent, and it was never 1 percent. That was serendipity. I think we might have heard said that it was not 1 percent ever. It was based on the load standard.

The idea that this standard, this 1 percent, I am not sure what we do with it. How do you measure it? So, for one year, what if we sent 1.6 percent down? That's what we think is going to happen initially is about 1.6 percent loss. I mean, that is the kind of loss we have seen during Phase 1. As we approach Waterford, we think that loss rate is going to go up.

In 55 percent of the areas we dredged in Phase 1, we had engineering controls in place. I know there is an idea that, well, we can just put some more in for Phase 2, but we had some pretty unique circumstances in Phase 1,
particularly the channel. We were able to block half of the river. We are not going to have that opportunity at many other locations.

We also really started seeing some of the negative consequences of resuspension controls, in particular, the impact on air where the concentrations in the open areas and the sheet-piled areas really got very high, and we were exceeding the load standards -- or the air standards, and then just the logistics of trying to work in areas of sheet piling, a real impact on productivity, and also the question is going to be how do you do this in a large scale in practicality.

We don't think it is practical on a very large scale to do that. So our expectation is based on Phase 1, based on sites, other sites around the country where we see 2-, 3-percent loss. This is not unusual.

So, yes, we can do a little better, and we certainly are not going to give up, and we will continue to improve as we go through it, but I think the expectation here and the reasonable expectation is that we are going to see about 1.6-percent loss. So EPA, with the 1-percent loss, we are not going to meet it. We are not going to meet
that 1-percent loss, and then once we start moving down river, how do you measure this?

    So, first year, if we send 1.6 down, does that mean the next year we can only send .8 down, .4 down in subsequent years? Just trying to figure out how you actually know what that number should be because we don't know ultimately what the mass is going to be.

    The other point on the 1 percent, all PCBs are not created equal. If the range of mass is 100 and -- well, I think EPA said 140- to 200,000 kilograms, and the real uncertainty comes about how deep in the low-confidence areas are the PCBs.

    Well, if I can send 2,000 kilograms or 1 percent down and the difference between the 14,000 -- I am sorry -- the 140,000-kilogram scenario, I am just taking out deeper PCBs now? Those PCBs aren't even bioavailable until I dredge them, and I'd lose 1 percent of them.

    So this treats all PCBs the same, and they're not. It doesn't take into account and nobody can say what's the impact of 1 percent or how much compromise is this going to be on the remedy, on the fish on the Lower River and the Upper River -- don't know because we don't know what the
1-percent number is.

   We need to use the model. It is the right tool to use, and the benefits, at some point, we have to, in a reasonable amount of time, start realizing the benefits. Initially, it was a 20-year period, and now we are hearing that there was a 50-50 chance that we are not going to see the benefit for 40 years with the proposed standard. Actually, with the new standard from yesterday, it may actually be out to about 60 years.

   Again, there is not a standard for the Upper Hudson. I think there needs to be one.

   And come back to the hard cap the exceedance. This really is an important concept. Frank, I won't this quote, but it was the expectation that this standard, the concept of the standard for the load and achieving the benefits of the remedy and having the standard achieve that benefit, that was part of the thinking.

   This is a statement that came out the week the Record of Decision was issued, so the thinking at the time the Record of Decision was issued, that we needed to have a "not to exceed"-type standard.

   So let me just summarize. Then, again, the areas
really, if we can get your input on, obviously other areas
but really on these areas, where there seems to be a pretty
significant gap between our thinking and EPA's thinking, the
need for an Upper and Lower River standard to protect the
benefits of the remedy, use of the model for setting that
standard objectively for the Upper and Lower River, and then
having a "not to exceed" standard for those load standards.

John, maybe I can turn it over to you. Do you
have an update on the model?

[Pause.]

MR. CONNOLLY: I think it's nice to be back up
here, but I am sure you guys are as tired as I am, so it's
nice it's the last day.

I am up here just to talk to you a little bit
about the model because we believe the model is key to the
performance standards, that we need a quantitative tool in
order to set standards that have some real meaning,
standards that will give us some assurance that we will
achieve the benefits. The modeling provides that tool.

In our mind, the first point up here, the need for
a load standard for the Upper Hudson River, the model is
really the only way that we can determine what that would
be, how much PCB can come downstream from the dredge, including both PCBs moving in the water column, PCBs redepositing, before we start to increase the fish PCB levels to a point that we think is unacceptable. The only way we have to estimate that is with the model. So the model has to be part of this process.

Now, I know there was some discussion about the model and whether or not the model could fit into the time frame. I am optimistic. This is not a process where we are in the middle of developing a model and working with oversight people and talking back and forth about how do we set this parameter and how do we model this and model that.

We have a model. So, at this point, the issue is having someone review an existing model. Perhaps that review will result in some suggestions for changes or improvements, which could be rapidly made, I would think, but the idea that it would be thrown out or that it would take a year or two to get comfortable with it, I just can't see.

Someone on the panel was kind enough to refer to us as one of the preeminent modeling firms in the United States. We certainly believe that. We humbly believe.
MR. BRIDGES: For the record, I think that was somebody in the public.

MR. CONNOLLY: Oh, too bad.

[Laughter.]

MR. CONNOLLY: I like that guy, whoever he was. But we believe that we are one of the preeminent modeling firms in the United States.

PANEL MEMBER: Noted.

[Laughter.]

MR. CONNOLLY: Noted.

That's how I got into the National Academy, based upon my modeling expertise.

But we have built a model with the most comprehensive dataset that exists at any contaminated sediment site in the world. So we are pretty comfortable that this is a good model, and we are pretty confident that when it's reviewed, people will agree that this is a good model.

Of course, it's not perfect, and, of course, there may be suggestions to change this or change that, but that can happen fairly quickly, particularly if we work aggressively together to review it and use it, and because
it is such an important part of this process, it is the only way that we can figure out what's an appropriate load to protect the benefits of the Upper Hudson River. It has to be part of the process. So I urge you in your deliberations to recognize that and incorporate it in the process.

Now, what does it mean in terms of process? Well, the model is up and running. As far as we are concerned, it's well calibrated and validated. We are using the model right now to try to do this load evaluation.

What we are doing is running the model at various levels of resuspension, calculating fish trajectories, and then looking at the relationship between fish concentrations and the amount of PCB we send downstream. We are probably going to do about eight runs of the model at different levels of resuspension to sort of generate the curve to compare to natural recovery.

This model, in order to do a 59- or 60-year projection, which is what we use it for, takes about 3 weeks, and we have got enough computers that we can run all of those simulations at one time. So, in a 3-or-so-week process, we will have numbers.

Now, it will take us a little while to process the
numbers, to generate the results, to look at them, and interpret them, but we are not talking 6 months, 8 months. We are talking about having results in the next month or so, sometime in June, worst case late June, that we will have results to report back to you guys on what we see in terms of the relationship between PCB load and PCB levels in fish in the Upper Hudson River.

At the same time, we are working on the redeposition issue, how best to model that issue, continuing to look at data, trying to get more insights in how that process works, what influence it would have. So, at the same time we are incorporating that and looking at that, how that affects the load to the Lower Hudson, and how that might affect the 1,200 kilograms that we are proposing to you right now be the load.

So, in the same time frame, we may come back to you and say incorporating redeposition, we think the load should be X, and perhaps that would be something under 1,200, but for now, our number is 1,200, and it's developed with a model, the best tool we have available to us to tell us what is the tipping point in the Lower Hudson, how much PCB can we send downstream and still allow us to begin to
accrue a benefit 20 years after this remedy ends.

We think it is a good number, the best number that we have available to us, and in contrast to the idea of a 1-percent guideline that has no tie to benefit, 1,200 has a direct tie to benefit.

So I am not going to talk to you more than another minute here, but I just want to reinforce we have a good working model, a model we are very proud of, probably the best model we have ever built, and I have been building models for 35 years. And it is an important part of what we do. We have got a load standard out of it. We can refine that. We can develop the Hudson Upper River load standard, and we can do that in short order.

So I urge you guys to consider that in the recommendations you finally make, and I think that's all that we would like to say to you, unless any of the General Electric team thinks there is something else we would like to say.

So I think we had an hour. We have used about a half an hour. I don't know how we want to work this with the facilitator or whether you want to go right to EPA or open it up to questions at this point.
MS. HOLLAND: Let's check with the panel. Do you folks want to ask any questions at this point in time, any in that half hour?

PANEL MEMBER: Well, at the discretion of the chair, I have a couple questions.

MR. BRIDGES: I also have several questions.

MS. HOLLAND: So we have until 9:05 for this segment.

MR. BRIDGES: Okay, that's fine.

MR. CONNOLLY: For meesh [ph] or --

MR. BRIDGES: Yes. I'll start with you.

[Laughter.]

MR. CONNOLLY: So I can't sit down, okay.

MR. BRIDGES: Well, okay. On the point of you said that the model is validated, I want you to describe to me, because then you followed that statement by saying we are taking a closer look at redeposition.

MR. CONNOLLY: Yes.

MR. BRIDGES: And my understanding was that you are making modifications to the modeling to either update, revise the processes that are represented within the modeling in respect to redeposition. So that's certainly
not validated yet if you are still working on that.

MR. CONNOLLY:  Yes.

MR. BRIDGES:  So can you expand on what you mean by validation?

MR. CONNOLLY:  Yes. We calibrated this model using the baseline monitoring period date. So the model was calibrated for the period of 2004 to 2008.

The validation of the model was we went back to the first dataset in 1977, started the model in 1977 and ran it to 2004 with the same parameter set that we calibrated it and saw how well we were able to reproduce the declines in sediment concentrations and the trends in fish over the period from the seventies to 2004, so that's the validation. So it validates the sort of pre-dredging look at the world from the model.

The work that we are doing, as you appropriately indicated, is to find ways to mechanistically handle the redeposition phenomenon, and, yes, we are continuing to work on that, and the model is not validated for that purpose.

But as we talked yesterday, we have got some sort of work-arounds for that at the present time in order to put redeposition in, but we are trying to figure out a way to do
it mechanistically.

MR. BRIDGES: Well, John, let me ask this. So you have got a validation effort that's based on a baseline condition, but now what you are trying to represent with the model includes a new process, a significant process in the river called "dredging." And so it seems to me that the validation process -- that's a really loaded term.

MR. CONNOLLY: Uh-huh.

MR. BRIDGES: Okay. I understand that, and there is a lot of nuance there, to use one of my colleague's favorite expressions, that people don't want to necessarily always consider, but, nevertheless, the validation effort, it seems to me, should include a dataset that has within it that process operating, that is, dredging, since that's what you are trying to represent, because you are intending to use the tool as an operational tool, right? So is that consistent with yours?

MR. CONNOLLY: Yes.

MR. BRIDGES: So it seems like there is more validation work that would have to be done that would include at least some portion of data that has dredging represented in that.
MR. CONNOLLY: Yes. And we have run the model for 2009 through the Phase 1 dredging and have shown in the materials that we gave to you that we can pretty well represent what happened during the dredging program until we get to the end and the post-dredging period because we don't have the redeposition process well described.

So we do a great job of reproducing the water column PCB concentrations through most of the dredging period. You start to get low at the end of the dredging period, and then we are low after dredging ends. And that, we believe is the influence of redeposition that is not effectively taken account of in the model at this point.

But we have shown that this model can represent the principal processes going on during dredging, excepting the redeposition issue. So the model is validated in the sense that it represents pretty well that during dredging in the past, that we saw in 2009 -- and we are working on the last part of that, the post-dredging impacts of 2009, so it's still a work in progress. But your point is a good one, and we have used the model to demonstrate that we can simulate what happens during dredging.

MR. THOMPSON: So, just real quickly, to follow
on. So, John, you must be including a component in that model that accounts for dissolved PCB release because, in previous efforts, it has all been based on TSS. Your validation on previous PCB data would be based on resuspended solids.

Now you have got a component, a high component in the dissolved phase. So I'm assuming, yes, you built that component into your model?

MR. CONNOLLY: Yes. Yes.

MR. SCHROEDER: John, my question is more regarding where the tipping point is and why this tipping point and how this tipping point occurs.

MR. CONNOLLY: Uh-huh.

MR. SCHROEDER: It appears to me that the real issue, if you are looking at Lower Hudson, is how have you changed the mass of bioavailable PCBs, and if we assume that mass of bioavailable PCBs is the mass in the bioactive zone --

MR. CONNOLLY: Yes.

MR. SCHROEDER: -- that that bioactive zone is changing all the time. I mean, there's resuspension, transport. There's a burial going on, et cetera, and so the
length of time matters for a load.

MR. CONNOLLY: Yes.

MR. SCHROEDER: Because if we deposited material into the bioactive zone early, it will possibly move on or possibly get buried and no longer be part of the bioactive mass. I mean, so this tipping point, you can look at it as fish tissue concentration and predict it by that means, but what we are doing in this remedy, of course, is reducing the loads in the future.

We all see that the slope of the road curve flattens out after you get dredging done, and backfilling, capping, and whatever. So what you are doing is saying, "Okay. Well, I have given a slug of bioavailable PCB mass into the bioactive zone. Of course, I have to figure out what that is, and, hopefully, the miles is doing all the unsteady conditions," and so we are adding in, you know -- it's like a reservoir. We throw in, you know, this extra bioavailable mass, and then we have these sinks in that reservoir, be it burial or be it diffusion and volatilization out of the system.

And then, we have, you know, later this slower rate coming in and that you are offsetting an added
component you have put in compared to this new load, and, of course, the concentration will be changing depending on how much natural solids are being transported. So, if you have very high flow conditions, the burial rate becomes larger, and, of course, that's uncertainty in the future.

Is that basically what this model is doing, is doing a mass balance of this bioactive zone to get to when the rates -- when we get back to the same mass that was in the bioactive zone as before?

MR. CONNOLLY: The model that we developed is just a model for the Upper Hudson River, so --

MR. SCHROEDER: Well, that's what I am talking about. Now, you were doing this based on the Lower Hudson, you know, the impact on MNA on the Lower Hudson --

MR. CONNOLLY: Yes.

MR. SCHROEDER: -- and we don't have a model you are telling me now of what that bioavailable mass is?

MR. CONNOLLY: What we have is a model developed 15 years ago or so for the Lower Hudson River that everyone refers to as the "Farley model." That's the model that EPA used along with FISHRAND to evaluate the fish increases that would occur in the Lower Hudson, which are an indication of
those dynamics.

Now, since that model is 15 years old, it was developed on a relatively sparse dataset. There is probably uncertainty in that.

PANEL MEMBER: And a course grid.

MR. CONNOLLY: Yes, very course grid.

But I think the point here is, you know, what we know about the Lower Hudson is that the remedy in the Upper Hudson does not provide much -- even with no resuspension, does not provide much benefit to the Lower Hudson River.

So what resuspension does is have some negative impact for some period of time that depends upon all the processes that you are talking about.

We don't fully understand all those dynamics. What we have is an estimate EPA has provided in terms of how long the fish will be up before they come down which, if you are up close to the Upper Hudson River, is 2 to 5 years after we stop dredging. If you get further downstream, because of the long residence time and the mixing, the impact seems to last longer. They show an uptick that lasts for about a decade after dredging ends.

So the only impact to the Lower Hudson is a
negative impact, really, and the idea of a tipping point is
the precedent that the agency set in the original
performance standards, which was their goal to send less PCB
down there than would have occurred under MNA and to track
that with load -- I understand, you know, Victor brought up
some good points as well about the fact that tracking it by
load really isn't getting at the issues I think you are
interested in --

    MR. SCHROEDER: Right.

    MR. CONNOLLY: -- and Victor is interested in it,
what are doing to the sediments, and so it is a poor
surrogate for that.

    But, nonetheless, it is saying that within 20
years, we want to overall have start to send less PCBs than
we would have otherwise, and so it's a surrogate measure.

    MR. SCHROEDER: Well, as soon as they get finished
dredging, they will be sending less.

    MR. CONNOLLY: Yes.

    MR. SCHROEDER: So, at 20 years, they become
improved.

    MR. CONNOLLY: You make it worse and then it gets
better.
MR. SCHROEDER: Right.

MR. CONNOLLY: And the one objective measure we have of that is following cumulative load; at what point do we start to send overall less down there.

Now, the other thing that's I think important here that has sort of gotten lost in all of this -- and I actually was surprised to hear the agency say this -- a couple of people have said this -- that, well, there is a lot of PCB in the Lower Hudson, and so we are not so worried about how much we send down there because there is a lot down there already.

If we were working on the TMDL for PCBs in the Hudson River and someone said there is a lot of PCB in the sediments of the Lower Hudson River, so sources don't matter, right? Yeah, we have got a system that isn't in compliance, all right. We have got fish levels that are above the goals, and, therefore, we don't have to control sources. That is sort of implicit in the idea that, well, there is a lot of PCB in those sediments, and so it doesn't matter if we send more.

Any more that we send is more than would have been there otherwise in a system where the fish levels are not
yet at the ultimate goals, and so it is having an impact, and the question is how much impact do we want to let it have.

The one metric that EPA used was cumulative load crossing 20 years into the future. We have adopted that metric. It's not the best metric. I agree 100 percent with you that a better metric would be to actually track what are we doing to the sediments and what are we doing to bioavailable PCBs, but we are not equipped to do that in a very good way.

That's sort of a long-winded response.

MR. SCHROEDER: Right.

MR. MAGAR: John, I have a couple questions.

MR. CONNOLLY: Yes.

MR. MAGAR: The first is a simple question. This 1,200, is that based on the new model or the old model?

MR. CONNOLLY: That's the new model.

MR. MAGAR: Okay. Thank you.

And the other one is just maybe more of a comment, that I think that there is going to be a tremendous need for transparency in this process. Transparency and openness, you would have to bring the EPA in, in a way that really
opens up the model and asks the questions, so maybe ask
different questions than you are anticipating.

MR. CONNOLLY: Uh-huh.

MR. MAGAR: I would refer to the late Steven Jay Gould who spent a lot of time writing about how our hypothesis very much can drive the way we are looking at questions and can even drive the answer, and I think you both have different hypotheses and different ways that you would want to answer these questions.

So I think thinking about that and maybe revisiting what are the questions or thinking about and having maybe a more open dialog in transparency would be very fundamental in making this work.

MR. CONNOLLY: And that's our goal.

Recognize that we have developed this model actually fairly quickly as we moved into this process and realized that the agency was not updating their model. General Electric commissioned us to build the model, and we have done that in a fairly short period.

So now we are at the point where we can open things up. We have got something, and we are looking forward to a very transparent process and hope to sit down
with the agency and just open up the books and talk
completely about it and do whatever they would like us to do
in terms of testing the model, running it, evaluate various
things with a given hypothesis.

So, I agree with you. Transparency is important, and we are going to encourage that.

**MS. HOLLAND:** Greg, do you still have a question?

**MR. MAGAR:** Oh, I am sorry, I still have another question.

Actually, this question might be as much for John Haggard as for you, and I like that you brought up accountability. And I think that is a very good way of talking about these goals, and I think it is very important, but the accountability has to work both ways, and I guess I don't really have a sense of what your all thinking is GE's accountability here to make sure that this is achieved.

You brought up, for example, the 1-percent load, what if we hit 1.6 percent the first year. I think I could ask then what if we hit 1,200 kilograms in the first 2 years. I am sure that there is a concern from the other side in terms of accountability that, well, you hit this, we can't dredge more, we have hit this limit, and we have
dredged a fraction of what was expected. And so there is
also an accountability to the public that we are achieving
the remedy.

So how do we resolve this tension where it's a
goal? 1,200 may be a very reasonable number, and yet we
also want to accomplish a certain area, a certain footprint,
a certain risk reduction that is anticipated from this
removal. I think both, you know, even 1 percent, this
problem could occur in either approach.

MR. CONNOLLY: I think this is actually another
place where the model helps us in the sense that what we
really want to achieve here is the risk reduction. The
decision about what we would dredge, what footprint we would
dredge, how much mass of PCBs were taken out, has sort of
gotten disconnected from the risk reduction. particularly as
we find more PCBs at depth.

Are we achieving risk reduction by going 6 feet, 8
feet, 9 feet to get PCBs? Were they really contributing to
risk? We need to get back to the idea of risk reduction,
and if it turns out that we and the agency can agree that
there is a limit to load, you can't send in, as Todd said,
an infinite amount of load downstream. There is a point at
which you can't send more load.

If it turns out that based on the experience of Phase 1 and the experiences we gain as we move through Phase 2 that we jointly realize that you cannot take all the mass in the footprint and still achieve the risk reduction objectives, then we in EPA need to sit down and say, well, what do we do now, and now sit down. Presumably, it takes a long time before you hit the 1,200. It is, look, based on what we have learned in Phase 1 and what we are now learning in Phase 2, in order to hit the risk reduction goals, we are going to have to rethink how we go about this.

The model can help us do that, but I think the measure here is risk reduction, and what we do has to be tied to risk reduction. It can't be tied to mass removal.

The NRC said mass removal does not equal risk reduction. EPA has said, in their contaminant settlement guidance, mass removal does not equal risk reduction, and I think we have to separate those concepts.

The goal here is not to get the body of material that sits in the footprint out. The goal here is to reduce PCB concentrations in fish, and we have to figure out the best way to do that because that's in everybody's interest.
MR. MAGAR: I appreciate that, and I think that --

MR. CONNOLLY: I am sorry for sort of soapboxing it.

MR. MAGAR: No, that one boundary might be in one place of risk reduction in a very simple sense would be the area that's being addressed more so than the depth or the volume being addressed.

MR. CONNOLLY: Mm-hmm.

MR. MAGAR: Hypothetically, an outcome of your model could be, in fact, maybe not so much volume, but an increased area even or that could end up with a benefit, or a greater benefit.

MR. CONNOLLY: Sure.

MR. MAGAR: So --

MR. CONNOLLY: In which case, then, how do you deal with that? I mean, do you say, okay, maybe we need to cap some areas? But that is a conversation that has to go on between GE and EPA.

MR. BRIDGES: Right.

Well, can I just build on that point specifically? Because I think previously, when this question was asked -- maybe I asked it -- you know, well, what are you going to do
if after year two, you are at 1,200, and I think the
response was along the lines of, well, we will have to work
that out, and I think my feeling would be is if this is the
way you ended up proceeding, you would have to work that out
in advance.

MR. CONNOLLY: Yes.

MR. BRIDGES: You don't work that out once it arrives, and I haven't heard anything, obviously, from either party about what that would involve or what that would do. So then that puts the panel in a position of making statements about an approach to a standard when it's really you all have not specified what is associated with that, what implications and consequences other than we would have to work that out, and what do I comment on that other than making recommendations on how I think or something you would work that out, but that is a significant gap.

MR. HAGGARD: John, let me --

MR. CONNOLLY: Go ahead.

MR. HAGGARD: I mean, part of what we would want to have in this process is, as John said, it's not going to sneak up on us. I mean, we will be monitoring. There are questions, you know, are we going to see a 1-percent loss,
are we going to see a 1.6-percent loss, how are we doing against the load.

We are going to know that year to year, and so one option here is to say, "Well, let's set a trigger point below that where, okay, we are on a spec, and we need to do something, and we are not going to wait for, you know, a year before we are supposed to be done for this to happen."

That's one concept.

The other is -- and what we proposed is a prioritization where we can look at getting those areas that really we know are contributing the most to the bioavailable PCBs in the river, water, and fish, and target those first, and then, as we go through, how are we doing on the actual losses, are we seeing a 1 percent, a 1 percent, you know, 2 percent, whatever, and have we improved or not.

We have weigh stations along the way, but what we have been able to show is that focusing on bioavailable PCBs and the removal of those gets the benefit, and you can get the vast majority of the benefit without having to get all of the areas, as John showed that one example.

So I think there is a process that goes forward, but part of the process is let's really try to prioritize
and do this in a smart way to start with.

**MR. FUGLEVAND:** This is Paul Fuglevand.

Just following up on that, John, we talked yesterday that if we take your 1,200 number and parse it out, we had 200 go this year, which means you have 200 available for 5 years, which means -- I interpret it when GE says 1,200 as a load, they are also saying probably 250,000 cubic yards a year as kind of a max, if we just use rough understanding of this year, and if we lower that for the redistribution, we could be lowering the total to less than that, maybe 200,000.

So I think it is valid to have a discussion on the table that is more direct than not just talking about a load number of 1,200 but also talk about what that really means and have GE speak to that, confirm back to us that, yes, that's what you think because, when you talk about prioritizing, to me it sounds like prioritizing a lower quantity that might be more on the order of a couple hundred thousands yards a year rather than 500,000.

If you could talk to that, it would help us in our deliberations on deliberating that proposed 1,200 standard.

**MR. HAGGARD:** John had a -- and I think it's in
your package -- description of how much we might remove
mass-wise versus what we might see on a resuspension site,
and, obviously, as we move forward, we are going to work on
best practices to control resuspension and try to eliminate
as we move forward.

The question, though, is, is that load the right
load, and if it is, that should be what drives our decision.
I think Todd was talking about when we start out, we should
really go into this with our eyes open and really try to do
smart work up front as opposed to ignoring what we know, and
if that load is really what we want to stay under to keep
the benefits of this and we go into this saying, you know,
we are not likely to meet it, is there a better way to
approach this project to start with. And that is where I
think if we can go in and say we are going to prioritize,
and if we do the best we can, which we will on controlling
resuspension, and we see pretty soon that we are not going
to be able to remove all the mass, we then have an
opportunity to say to the agency and for us to sit down and
say how are we going to do this.

But I think the prioritization is an important
piece of this, that we do use what we know to start with,
and we make decisions based on what we know and reasonable estimates.

But I think to ignore that -- you know, we have a limit. That limit is really intended to preserve the benefits and to move forward and say, you know, we don't think we are going to meet that limit and do so without taking it into account and trying to have some process is, frankly, I don't think the right approach here, but I think we do have flexibility. But what we really need to focus on, we believe what we have up there, which is what's the right load, can we agree at least that there should be a limit and there should be a way to protect the benefits of this remedy, and here is the metric that we should look to, and then we can move forward from there, we and the agency, on moving forward.

**MR. FUGLEVAND:** I hear what you are saying, but I don't think you have answered the question.

Does GE have the understanding that if you set the load limit based on the experience of the last year, that it would also result in a lesser volume being dredged, and do you agree or not agree that based on the experience that a load limit of 1,200 leaves 200 per year, which is around
250,000, it is basically the amount of dredging you did in Phase 1 per year?

**MR. HAGGARD:** If we have the same loss rates that we saw in Phase 1, then we are not going to be able to get out the total mass targeted.

If we allocate the load -- and I think what you have done, Paul, is you have allocated the load and said, well, let's say we have 200, and we have got about 250,000 out each year, and assuming there is a linear, then you would end up getting about 250,000 a year. But a lot of assumptions go into that, obviously.

But if you go back and you look at area remediated too, is there a better way to do this, can we go in and dredge area like on the residual standard -- we can get in, we can get out -- we can get 90 percent of the mass out, we can have high productivity, and that 10 percent of the mass, going after that, contributed how much to load, are there smarter ways to do this.

But, again, it's about -- I don't mean to be sound flip here. It's about what the volume is to try to balance the benefits versus the impacts. The impacts are real. The benefits are theoretical right now, but the impacts are
real. We know they are occurring. We are hoping the benefits occur, and we have got models to say, yeah, we hope the benefits are going to happen, but we know, we have measured the impacts.

I don't know if that helps, Paul.

MR. FUGLEVAND: Yes, it does, thank you.

MR. CONNOLLY: John Connolly.

MS. HOLLAND: Do you still have a question?

MR. HARTMAN: Yes.

MS. HOLLAND: Greg has been waiting for quite a while.

PANEL MEMBER: Go ahead.

MR. HARTMAN: Kind of back to the release at the dredging site and the approach to the dredging activity, this model, you literally had a multiple of ways to dredge during the Phase 1. You know, you did it a lot of different ways, but there is still no near — I will call it "near dredging database." This model cannot include sort of a near dredging database; if you dredge this way, this is the impact, and this is the impact downstream on the model.

Am I correct in that?

MR. CONNOLLY: I'm sorry. John Connolly.
You are correct. Our analysis of releases are
based for the most part on data 3 to 7 miles downstream, and
so we have extrapolated that going forward and have no
ability right now to see how that would change if we change
the way we dredge, for example.

So that is a limitation in what we have, and I
think we heard from the panel that, as we go forward in
Phase 2, we need to get some more data closer to the dredge
to help us understand that, and I think that is a good
recommendation.

MR. HARTMAN: Okay. Thank you.

MS. HOLLAND: We have got about 5 more minutes in
this segment.

MR. MAGAR: Could you speak to the uncertainty
around that 1,200 number? I mean, is that 1,100 to 1,300 or
300 to 2,500, and how would you propose managing that
uncertainty to work towards the lower end or the upper end
as you are thinking of this? Because I think MNR and the
flows and everything is a fuzzy equation.

MR. CONNOLLY: We have not done a formal
uncertainty analysis to do that.

My opinion is that the uncertainty is not great
because the uncertainty in the model processes affect both lines. They affect the dredging line and the MNA line, so things get correlated, they both move together.

So it may be more like the 11- to 1,300; you said that it would be 500 to 1,500. I have not thought about, you know, how you would deal with that uncertainty, but to the extent that you want to use the precautionary principle and you want to be protective, that would tend to move you towards the one side of the uncertainty now.

**MR. HAGGARD:** John, I would also add that, you know, as we move forward in time, I mean, I don't think we could ever view the model or any projections done as static. They need to be verified and validated, and, you know, as the project moves forward, we are going to have additional water sampling. We are going to have fish sampling. You know, is the river behaving as we thought it would? I mean, that would be more of a real data check as opposed to a projected uncertainty analysis, and I think as we move forward in time, Vic, we will have a better understanding are we really -- is the river operating as we thought it was.

**MS. HOLLAND:** We have 5 more minutes. Any more
questions from the panel?

MR. SCHROEDER: I have a question regarding the background levels in the non-dredging areas. Do you know off the top of your head what the average concentration in the non-dredging areas in the Thompson Island Pool are as an example?

MR. CONNOLLY: Yes. We passed out a packet to you all yesterday that has tables in it, that have all of those values.

MS. BENAMAN: Jennifer Benaman.

It is, I believe, Table 3 of the 7-page -- it's just a Word document printout and shows the non-dredge surface, total and Tri+, and that's based on the SSAP data that was collected from 2002 to 2006 or so.

MS. HOLLAND: Tim, do you want to try to ask your question while they are reading that?

MR. BRIDGES: So, in this table, but not the -- [Laughter.]

MR. THOMPSON: I would have, but Todd jumped in.

MR. BRIDGES: I am just going to -- this table, so the non-dredge, that refers to areas outside the prisms; is that right?
MR. THOMPSON: Okay. I am going to jump. So, looking at the range of values, 1,100 to 1,300, EPA has proposed, on a total PCB basis, 2,000. It's only about 1.5 times what you guys are proposing.

What becomes -- it's the downstream or the outcome of the model that would be the most interesting. What would be a significant change in the fish tissue concentration? If it's only 1.5 times, I would have to say -- I would kind of shrug my shoulder and say is that real, or not only is it real, or is it important.

So what I don't see is we have run through a process, and we really don't have a downstream decision-making process to say, well, what is really an important change in the fish that would cause us to raise or lower that standard. We are just saying right now it's the 1,200 time to MNA, that that would be it.

So some thoughts on how to set downstream?

MR. CONNOLLY: One way to think about it, just off the top of my head --

PANEL MEMBER: Yes, sir.

MR. CONNOLLY: -- is we are doing this remedy for a certain benefit to the Lower -- to the Upper Hudson, and
the difference is in fish, between MNA and that remedy, are  
the justification for doing this.

PANEL MEMBER: Sure. I understand.

MR. CONNOLLY: So that difference is at one point  
the level of what is significant and what is not, I mean,  
because that difference is a difference that was judged to  
be sufficiently large to warrant this remedy.

Based upon the earlier predictions, when we start  
to get out 20, 30 years in the future, the differences are  
on the order of about 1.5 or so. They are about 1.5 lower  
with the dredging than without.

But I don't have anything other than that to give  
you a perspective right now.

MS. HOLLAND: I think we probably need to go ahead  
and segue into our next presentation.

MR. CONNOLLY: Okay. Thank you.

MS. HOLLAND: We will have a huddle for the panel  
during the break, and then you guys can decide whether you  
want to do more Q&Q for EPA or GE after our break.

So I believe -- EPA, is your computer -- you're  
switching. Okay. And you have your lavaliere, or do you  
want to use a handheld?
[Pause.]

**MS. HOLLAND:** Ed, are you going to do the intro, or Ben?

**MR. GARVEY:** He just stepped out.

**MS. HOLLAND:** He had to run out for just a minute. I didn't know if you wanted to --

[Pause.]

**MR. BRIDGES:** Well, in this hiatus, one comment that I would make -- and maybe -- well, to add on to this, so maybe a finer point, it seems to me that there a number of attractive factors in my mind to the establishing a firm limit. First of all, it is a standard, at least that meets the definition of what a standard is in my mind, but at the same time, such a limit like that sets up potentially what economists call "perverse incentives."

That's what makes kind of the decision tree that surrounds the implementation of such a limit important because the potential for perverse incentives within that are considerable.

**MS. HOLLAND:** Okay. Ben is back. You are welcome to move that wherever you want.

[Pause.]
EPA Presentation

MR. CONETTA:  Tim is missing.  Tim is missing.

MS. HOLLAND:  You can go ahead.  He just went to the rest room.

MR. GARVEY:  Tim is here.

MR. CONETTA:  Okay.  Good morning.

PANEL MEMBER:  Good morning.

MS. HOLLAND:  Ben, just give your name again.

MR. CONETTA:  Ben Conetta with EPA, the project manager for the Hudson.

   Obviously, we would like to thank you, the panel members, for your effort, your time, your seriousness.  It's a serious issue.  We appreciate the hard work you guys are putting into this.  It's a lot of information.

   We found some common ground I think in the bathroom.  I saw John there.  I think we both agree that we are all tired.  I think you guys are too.

GE PRESENTER:  I am glad you clarified that common ground.

MR. CONETTA:  I went to take a power nap actually.

   We are going to be brief too.  I think we are going to try to set up and answer some of the questions, I
think, that have been out there about risk and why we have
got the number we have gotten, why we think it works. It is
not just a modeling exercise. It has got to be based on
what do we think is going to happen.

The other thing I would like to say is, obviously,
that you have heard from the public and other State
agencies. We thank them for their input. They are an
important part of this process.

I think we may have different ways of getting
there, but I think we are all committed to seeing that this
river is healed clean, that the right thing is done for the
river.

I am going to go through a couple of slides. I am
going to introduce what I think we will do today.

Just as an overarching thing, I think one of the
things that our message has been, after the project was done
in Phase 1, that we think there is a lot of room for
improvement. What effects those improvements will have on
the project, we don't know yet. I think that is an
important piece to keep in mind because we need to go out
there again, do it the best we can, and see what happened
out there.
This is sort of the layout for today. Don Hayes is going to give you a little brief -- a couple of slides on the redistribution issue, things that we have thought about. Some might address some of the issues going on.

I think the second issue is probably the one that I think the panel has been very interesting hearing about. I think it sets us up for why we think what we have chosen is appropriate and allows us to meet the goals of the ROD and also to meet the benefits of the remedy.

The third piece is interesting because we have been talking about high-value areas. Ed is going to speak to that as well. Ed Garvey is going to speak to the middle two pieces.

We have already done that. That has sort of not been -- and Ed is going to lay out what we have done and what the remedy has done. There are a lot of areas that we are not addressing. We have addressed what we need to address.

Some might argue -- and you have heard some comments -- that we need to address even more areas. There is more contamination out there that we are not getting.

Finally, we will do a closing on improvements.
MR. HAYES: All right. Good morning.

First, if I start coughing, I apologize. I have a cold. We have a couple of toddlers living with us recently, and I forgot what great Petri dishes they are. So I am the one that, of course, is suffering. So I hope you will bear with me.

I also appreciate what a load you are under. I have had a hard time myself trying to catch up on all the data that's available here and understand it. Usually, I have to ask someone.

But what I want to do here is just take a few minutes, because the redistribution issue came up, and I wanted to give you a little insight to at least the thought process behind redistribution that took place 5 or 6 years ago when we were working with this and maybe a little bit before. And then I want to show some data that you can look at and see if you think you believe that it supports that thought and whether or not -- well, we are guilty a little bit to the myopic thinking that Victor alluded to with Stephen Gould's work about your old hypothesis. You know, you sort of think you know what is going on, and that's
where you head. So, because PCBs are so hydrophobic, you
know, our thinking all along was if we can track the solids,
then we can have a pretty good idea of where they are going
to end up and what the redistribution is, and that is what I
am going to talk about.

If you look at the data from Phase 1, there appear
to be some other mechanisms that I am still trying to figure
out, how this happened and how the dissolved releases
occurred. Maybe somebody else has a great answer.

But our thinking was pretty simple. If you look
at the data that we have and how the solids act once they
resuspend in the water column, the majority of them resettle
in a fairly short distance, say a thousand feet or so from
the dredging operation itself, and so what is left is a
fairly small load, and then you can compute it from there
where those may transport to because of the limited area and
start to look at the impact, as Paul pointed out, in the
biologically active zone, and it suggests that there really,
you know, should be a major change from those redistribution
of sediments because of the total mass available.

So, when this came up the other day, we began to
think about, well, maybe can dig out some of that stuff from
5 or 6 years ago and all the model runs we did and
calculations, and somewhere there is some write-up that
explains all those thought processes and the calculations
and how we concluded that. While redistribution is a
concern, the majority of the time, it should redeposit back
within the dredging footprint, be redredged, except for
around the boundaries, when we have a concern, and if you
add those up they don't seem to be that significant.

But then, after some thought, I thought, well, the
proof is in the pudding, and I haven't had a chance to look
at all the data, but I thought, well, we have data in Phase
1, maybe we just look at it, and it should prove that we are
at least on the right track or not, whether our thoughts
were correct.

So the data we have that I was familiar with --
and I had looked at a summary table of the near-field
transects, and it seemed -- it has been a while back since I
looked at it, but it seemed to sort of fit that thought
process. I thought, well, maybe we can go look at that.

John Connolly, in his presentation on Tuesday,
mentioned that they did some bucket decant studies, and
there is a little bit of data there, and I thought, well,
maybe that's another place we could see, you know, just sort of what it shows us.

Lastly, he also mentioned the sediment trap data that was collected, and, of course, the concern there is that we didn't have a baseline. I thought, well, if the dredge is the major signal, we should be able to see from that data a signal.

So I started yesterday morning. While you guys were debating, I was back there pulling for the first time, looking at the sediment trap data and trying to make some sense of it. And I only had a limited amount of time, so I looked at, just picked a couple of the datasets from downstream of CU-18, and I am going to talk about that first.

What I did was hold the data as posted. They have total mass at different sediment trap locations. They are downstream. There is one, a transector 5 that I believe is about 200 feet across, a width of about 200 feet. There were maybe 50 feet or so downstream with CU-18, and then there is another transector, another 50 or 65 feet downstream from that, another 5, and then another one at about 300 or 350 feet downstream, another 5, and then there
is 2 that's about a thousand feet or 900-something feet downstream, it looks like.

So I just took those data, and there were two. The periods I selected, there is a period from the 22nd of July until August 18th, I believe, and then a second period in October that I just pulled those data, just to see what they looked like.

I then took the masses that were collected. I used a fairly generic, loose sediment, 700 kilograms of cubic meter generated depth, but it doesn't matter too much from that, and then also looked at initially the total window, but then I realized the traps were out at different times and there were some days where there wasn't dredging. So presuming that dredging was the primary contributor, I divided them all by the number of dredging days to get a rate per day.

Now, that is not perfect. It's a starting point to look at those data, and here is what you see, is that these traps -- and, again, there is two here close by and within 100 feet. It sort of represents a benchmark. Obviously, if you get closer up in the CU, they are going to be higher, but you can see by the time we get 350 feet
downstream, we are down to about 20 percent of what we were at 100 feet, and by the time you get down at about 1,000 feet, we are down even further.

So someone mentioned a number of about 90 percent falling out within the first thousand feet. I think that probably generally supports that hypothesis. I don't know where that came from, but the point here just is that the sediment trap data from these two datasets seemed to show that there is a fairly rapid decrease in the solids in the water column and sort of fit the model that we started from.

So then Solomon was kind enough to gather from -- and maybe I should back up here and point out that, again, one of the concerns about this data was that we don't have ambient or baseline conditions. This includes baseline, but if we subtracted baseline, we would see a more rapid decrease and a more significant change.

MR. BRIDGES: Don?

MR. HAYES: Yes.

MR. BRIDGES: Could you refresh my memory as to where within the water column the sediment traps were located?

MR. HAYES: I believe they were on the bottom. I
think John would be the best --

John Connolly is nodding his head that that is correct, they are on the bottom.

So then we looked at the -- or asked Solomon about the sediment, the near-field transect data. We picked one from -- I wanted to get somewhere besides CU-18. So we picked the one at East Rogers Island, which is just down -- if you went -- when I went to the site, we went up into the channel there, and you went right by the buoy, which probably means that some of the spikes here are from propwash, because I know we went right by it and stirred up a lot of mud when we went by.

But it's about. I believe, listed as being 25 feet or something downstream of the opening there, the silt curtain, and the only point I want to make here is that -- and I should have pointed this out about the previous slide -- that after yesterday morning going through first and doing these calculations, I decided to convert them to equivalent or some estimate of water column concentrations.

By the time you get out to the end here, you are in about a 10 milligram-per-liter concentration to get this type of deposition. So, to me, it said, okay, you know,
that's a reasonable number. It sort of makes sense, and I
felt better.

So, when we looked at these, you can see again
that the majority of these points are less than 10
milligrams per liter at this location. All these specs, you
see a few spikes. There again, I am guessing these were
propwash induced mostly, and then there is an area down here
that's higher, clearly down in November, and I am told those
were during some backfill operations that were occurring.

On the photos, we see a little more resuspension
during those events. So it is not too surprising, and I
like that because it does tell me that the monitoring is
picking up a signal, and so it picked up a change, and so
that suggests to me that it makes some sense and it's okay.

Remember, this is a log scale. So these numbers,
there is quite a significant difference from these that are
going up and that these are down lower.

The third piece of data was the bucket decant
study. And, John, I didn't quite pick up when you mentioned
that there is a time of travel issue, because I hadn't
looked at it. When I looked at that last night, I saw what
you meant, and if you have looked at bucket dredging, one of
the things we do know, that the signal from the operation is very cyclic, and it's from sparks that occur. One of those sparks occurred around on the bottom and then when it breaks the surface and the pressure changes, and so you see this cycling.

And so they had some data collected from when the bucket came out of the water, and then 50 feet downstream, they took a water column sample, and I didn't check all of them, but one of them, I know is like about a 7-minute time difference.

Of course, if you got a foot per second in 7 minutes, you know, they are at 350 feet downstream or something, the signal is, and so the numbers they got weren't the peak, but they do represent probably a reasonable averaging-type condition, and there were three values, there was two about 6 and one about 18, and so that is what I have shown here. Okay.

So the only point I am trying to make -- and that was 50 feet downstream from that. So the only point I am trying to make here is just that I just want to give you some insight to our thinking about redistribution was that the majority of these solids were going to settle quickly,
and since we believe that was the primary transport mechanism, that it really didn't seem likely that there would be a lot of downstream impacts to the biologically active zone. We did do some calculations there based on these smaller concentrations, but they don't really build up because there is not a large aerial extent.

So, anyway, I at least concluded from this quick and dirty operation yesterday, how I spent my day during the panel discussions, that, you know, it seems to fit our initial hypothesis.

Also, I talked to the EPA field team that was out every day. When I came on site, I began to ask questions about this, and they told me, "Oh, yeah, yeah. You know, we see the plumes, but they don't last that long and such."

So, anyway, I believe that it looks like there shouldn't be a lot of TSS beyond the dredging footprint, except again right down along the edges.

Then one thing that I did not consider is the backfill, and I guess I was thinking that in a flowing river, it probably would be redepositing the backfill closer to the bottom to avoid losses, but the way this was distributed at the top of the water column, you see quite a
bit of loss in a fairly high-velocity environment, and so we also have losses from these which are even a little bit higher than dredging, though we are not putting as much volume, but it is at least a significant amount that is going to go down and also be mixed back with these in areas that are outside the footprint. So it should cover a somewhat similar area.

So that is all I have to say. Ed?

**MS. HOLLAND:** We were just going to do clarifying questions only during presentations, and then we can ask more detailed questions after the break.

[Pause.]

**MS. HOLLAND:** Ed, go ahead and say a couple test words.

**MR. GARVEY:** Hello. Hello.

**MS. HOLLAND:** Do you want to just use a handheld if that one is not working?

**MR. GARVEY:** I think it's good now. Am I all right? Good morning.

**MS. HOLLAND:** Ed, give your name again just for the recording.

**MR. GARVEY:** My name is Ed Garvey. Welcome to
the Hudson River marathon.

[Laughter.]

ATTENDEE: This is the ultra marathon.

MR. GARVEY: Was that maelstrom?

ATTENDEE: No. I said it's the ultra marathon.


Well, anyway, I am going to talk a little bit this morning about our look at post remediation risks.

In response to the panel's concerns about things, we did a little bit of sleuthing through our older records on model runs and the like, and I have actually got a couple of things that I think would be of interest to you this morning.

Let me start with fish tissue conditions that we looked at in the river, just to refresh the panel's memory, not for anything per se, but I want to make a point with this relative to our model.

This is just going to be a plot of concentration versus time for fish tissue. These are going to be the average fish tissue concentrations in the entire Upper Hudson on a filet basis.

This is Marc Greenberg's analysis about these
samples that are a combination of State and GE analyses over
the last 10 years.

So that curve there is the HUDTOX Upper River
average fish tissue concentration for a sports fish
composite based on the average of the upper 40 miles of the
river. So that represents what we thought at the time of
the ROD, what we thought the fish trajectory was going to
be.

MR. MAGAR: I'm sorry, Ed. Just to clarify in
terms of everything, is the model run, or is this data?

MR. GARVEY: That is model run.

MR. MAGAR: That's model run.

MR. GARVEY: I am going to show you more in a
minute.

MR. MAGAR: Appreciate it.

MR. GARVEY: That's the model run. That's the
model run that we did in 1998. This is the point of
departure. This is the last calibration one on this model.
This is the HUDTOX model for the Upper River.

MR. MAGAR: That's fine. Thank you.

MR. BRIDGES: Assuming baseline condition or
dredgings in there?
MR. GARVEY: This is MNA.

MR. BRIDGES: Okay.

MR. GARVEY: No action. This is what the river is supposed to do in the absence of a remedy.

I am going to show to you some fish tissue concentrations since we ran the model basically. So that is black bass. It's an average filet for the Upper River. So it's average over the 40 miles.

This became relatively fast, a little faster than the models, but it is also higher than the model concentrations were. Just a point of comparison.

I am going to show another fish, and I will show you brown bullhead.

MR. BRIDGES: Ed, just to be clear, this is actual data now.

MR. GARVEY: This is actual data.

MR. BRIDGES: Okay. Thank you.

MR. GARVEY: Sorry.

So this data, the line is a model.

So this is black bass measurements over the last 10 years. This is brown bullhead. So we are seeing both the brown bullhead and the black bass, the model tends to be
a little bit low, but the trend is not bad. This was capture, what the fishers are probably seeing, general similar rate of decline.

And a good look at the yellow perch. They have kind of bound the problem on the other side, the mixture on the other side. So this is just kind of indicating that our model runs that we have run in the past, while we think they are still a little bit optimistic and perhaps a little bit faster than we think the river is recovering, they are not a bad approximation to what we have observed over the last 10 years. That is what the point of this slide is. We hit the data fairly good.

MR. BRIDGES: Again, because I am particularly slow amongst this group, this represents all fish tissue taken over the 40 miles, the filet data --

MR. GARVEY: That's right.

MR. BRIDGES: -- that's averaged. Okay.

MR. GARVEY: Yeah. So it's an average over the whole river section. This is just a basis to compare.

This is just telling us our model is not doing a bad job. We think this can be improved, you know, it could be improved, but you don't really need to. We think the
model is going to be good enough to make the kind of
decisions we are making now.

MR. BRIDGES: Do you suppose that -- well, never

MR. GARVEY: You get to ask me those questions
later, Todd.

[Laughter.]

MR. SCHROEDER: Well, are these normalized or
anything?

MR. GARVEY: What? No, they're not.

PANEL MEMBER: It says milligram per kilogram. wet
weight.

PANEL MEMBER: I see that.

MR. GARVEY: Anyway, given that the fish
concentrations are on the low end -- of higher end of what
we predicted but not too badly represented by the model,
they have got to lend some credence to the use of the model
for conditions in the future, and, of course, that was the
basis for decisions in the ROD.

I am going to show you some model runs. These are
all model runs, no data. These are model forecasts. This
is for the Upper River now.
Two important things to point out here. The upper line and the lower line represent risk-based targets that are identified in the ROD. This represents two fish meals -- no, sorry -- one fish meal every 2 months. This is one fish meal every month.

These are not the ideal targets, but they are the first interim targets that were identified in the ROD. You can look at how fast we get there as a measure of what the impacts of the remedy are.

This is a log scale of vertical concentration, and I will have to show you first how many. Okay. So that is the estimate from the ROD, from our tox model in the Upper River. This is not the entire Upper River I am showing you on this curve. This is just the Schuylerville Pool, River Section 2. Okay. So this is the first pool down from the Thompson Island down.

Then I am going to show you some of the fish tissue concentrations. Now, we ran to look at what would be the best that we could do with the remedy that we were getting, essentially no resuspension remedy, not real, but it represents the ideal curve; if you could do this perfectly without spending PCBs, how would the system
respond.

Okay. This is at this next curve I am going to show you here. We see that this is the reason that we are doing the backfill. We are getting a big improvement. Of course, we would like to know that we can get this. The question is can we get this if we spill out PCBs into the Upper River. Okay. That's the question. But this is a significant improvement.

Notice that the times of these targets is about 15 to 20 years between these targets. So this is buying almost a generation's worth of improvement relative to these targets, which is the basis for the ROD.

MR. BRIDGES: Where is the dredging occurring in this?

MR. GARVEY: In the next pool up. Actually, no, it's --

MR. BRIDGES: Year, by the -- in the years.

MR. GARVEY: Thank you, Todd. Yes.

In terms of targets, the dredging ceases in the Thompson Island Pool basically around 2009. It begins 2006, because remember this scenario has no resuspension. So you can't tell when it starts. You just know when you see an
improvement. So, basically, we're seeing an improvement the first year afterwards, but it will help when I start to put loads on here from dredging.

But this is the ideal curve. This is not what we expected to get per se but represented the upper bounds of what we could get.

This is what we get if we load the river to 350 nanograms per liter at the Thompson Island Dam. So now you can see when dredging starts very clearly, because the uptick over MNA, okay, so we will see the river concentrations or it's fish tissue concentrations come up in response to the 350 nanograms per liter, and we see it defined very rapidly, and you are only about a year, no more, relative to the ideal solution.

MR. SCHROEDER: Is this 350 nanograms per liter only during the dredging season?

MR. GARVEY: Yes, it's only during the dredging season. It's the May 15th to November 1st load.

You are loading the river as if we are hitting 350 nanograms per liter at the first far-field station. So we have in the mechanistic model, load decreases in the concentration as you move downstream, but this is loaded as
if Thompson Island Dam were at 350 for the duration of the
dredging during May, probably May DoC November 1st.

So we are not paying a heavy target, heavy penalty
for hitting the target. Loads, we are doing pretty good,
still getting a nice, big improvement over MNA.

I will show you one more. Take off the 350, put
on the 500. So it's the 500-nanogram-per-liter forecast.
Now, this one we didn't have when we talked -- you had this
curve in some of the handouts we have given you at other
stations. It's not in this particular station. We showed
you this at River Mile 154 and maybe 189 in the addendum,
but we sent it.

This is River Mile 184, and digging through our
treasure trove of model runs, we didn't think we had done
this one, but we found a 500-nanogram-per-liter load. So
this is the maximum load that we have run in the Upper River
in 500-nanograms-per-liter condition.

So, represented here, this starts in 2005 as
opposed to 2006, approximately a year earlier, but we see it
again. Our time to target is about the same, a little bit
less than the ideal solution. So we are getting a big
benefit from MNA, relative to MNA, but we are also not
paying a heavy penalty for losing as much solids. So we have looked at the impact on the Upper River, and this does represent solids loads redistributed into the Upper River as a result of dredge.

Yep.

**MR. MAGAR:** Are these not the same MNR or MNA curves? Because this one has you down at 1 ppm by 2010.

**MR. GARVEY:** They are not the same exact MNA curves because that is the average for the entire 40 miles. The point of that slide was just to compare the average market compiled data, but the average of fish tissue versus the average of the Upper 40 miles.

This is specific to this section. So this is only basically a 3-mile pool. You are looking at the average for the entire 40 miles on that.

**MR. BRIDGES:** Ed, refresh my memory here. As I recall from the 2004 EPS, the 350 represented a resuspension rate of 25 percent, and 500 was .6 or something along the lines? I can't remember exactly.

**MR. GARVEY:** No, it was higher than that.

**MR. BRIDGES:** I don't think so.

**MR. GARVEY:** I think it's higher than .25 percent.
MR. BRIDGES: Well, maybe, but both were less than 1 percent, as I recall.

MR. GARVEY: No, you know, I think --

PANEL MEMBER: I could check pretty quickly.

MR. CONETTA: I don't think I remember either, but I don't think it was between -- I don't remember. It's in the schedule.

PANEL MEMBER: I will look. Go ahead.

MR. GARVEY: I think it's higher than 1 percent, but, at any rate, this is the highest model run we have run for the river, and we have essentially -- my point is that we have looked at impacts in the Upper River, the fish tissue concentrations. Anyway, my point again is we got a significant benefit over MNA as well as only a minimal improvement -- a minimal detraction, if you would, to time to target.

MR. SCHROEDER: Now, Ed, the assumptions in that modeling run was that there is no change in the sediment surface concentrations outside the dredging areas.

MR. GARVEY: No, that is not true. These model runs load the fish, the sediments and the PCBs at the point of dredging roughly. The HUDTOX model
had a 27-cell series. We picked two cells in the model. We loaded half of thing the first period, at the first cell, and half of the load, if you would, at the second cell for the rest of it. So we approximated dredging across all 27 cells by just loading the northern one representing the first half of the effort and the southern one for the second half of the effort.

So, within that, we are loading PCBs and solids and allowing -- this is a mechanistic model. We are allowing solids and transport PCBs, PCBs movement, so there is redistribution, let's say, starting at about -- we were taking solids loads about -- I want to say about 1,000 feet downstream in the dredging.

So it's not solids transport from the point of departure to the bucket, it's solids transport from the point of departure of a thousand people on the dredges.

Does that make sense?

PANEL MEMBER: I think so.

MR. GARVEY: All right.

Okay. But to put this in context now, these are the concentrations that we saw in the Upper River during Phase 1. So we are not expecting that the kind of
concentrations we saw last year are going to have big
impacts in the pools downstream. Thompson Island Pool, the
average concentration is 212. That is all that appeared at
dredging, May 15th to October 27th.

So you see a significant decline in concentrations
just like you see a significant decline in loads further
downstream.

That is just a compilation of data, but the point
is here that the model simulations that we run here are at
higher concentrations than the conditions that we saw in
Phase 1, and so, you know, we are not predicting the kinds
of conditions we saw in Phase 1 or even worse than the
conditions we saw in Phase 1, are going to have long-term
impacts to fish tissue recovery in the Upper Hudson.

Now we will do the same thing to the Lower Hudson.
I will show you the two curves we showed you before, the
same layout, only now with the Lower Hudson, we are actually
getting -- the Lower Hudson actually gets close to the ideal
target, .05, which is one fish meal per week, which is EPA's
risk-based goal.

But these are all -- these are the same other
ones. This is the one fish meal every 2 months, one fish
meal every month, and this is one per week.  
So, again, put on the MNA curve. That's the MNA curve again for the Upper River, and you see that formula's forecast, we are hitting the first target already according to MNA, and we are hitting the target of one fish meal every month, around 2018 according to this forecast curve.  
Now I am going to look at loads, these loads we talked about before.  
Oh, I am sorry, one more thing before I do that.  
This is the idealized curve of the remedy, no resuspension. So we are not getting anywhere near as big a benefit in the Lower River. Again, this is not the primary purpose of the remedy. It's the remedy of the Upper River.  
So we are only getting a marginal improvement, but this is still, given the slow rate of recovery, it is still going to be a few years sooner when the MNA gets during these targets, but it is not a lot, a couple of years. Okay.  
So the idea is to kind of just stay below the MNA and try to get to that curve in the ideal situation, but we are not talking about a big sacrifice, if you would, in terms of reduction -- or a big improvement in the Lower River. This is a minor one, although certainly low.
We now look at these scenarios, which this one now is just under our proposed load. These are Tri+ loads, so this is 600 as opposed to 670 that we are opposing, and then we ran a couple higher ones.

I showed you these two on Tuesday. I said we had run a higher one. I am going to show you that one as well. This is, effectively, double the load standard that we are proposing.

That's the 600. Now, we ran this scenario loading the baseline and upon completion of dredging here, so it's dredging starting later, starting in 2009. So this first uptick represents the actual load in 2009. So, really, this curve is starting to forecast at this point forward, and then we basically used this baseline starting about here.

All right. So we start.

Once the dredging is done, the loads are loaded. It drops to the equivalent of what is driving the MNA, and so we drive the rest of this curve with MNA loads. So it is going to hit tangentially right here. I stopped it here for a reason, I will show you in a minute.

We are basically seeing that the 600-kilogram scenario drops to the first or second target only about 2
years after the MNA. It's about maybe 3 or 4 years relative to MNA here.

MR. THOMPSON: Ed, just to help me understand, where is the remedy occurring on this curve, 2005 to 2010?

MR. GARVEY: No, the remedy is delayed here. It started in 2009.


MR. GARVEY: And it's going up to 2050.

PANEL MEMBER: Okay. Okay. Thank you.

MR. GARVEY: This is the actual load, if you would, over MNA for the first year.

So we did 600 kilograms. We did 800 kilograms, and we noted this yesterday or Tuesday. There wasn't a lot of difference between them.

We did 1,200 kilograms, not a big impact. Each of them timed from completion of the dredging here at 2016 to the time where they almost hit the MNA curve here, is about 4 or 5 years -- 4 years, about 2019.

Now, what I did here, just for -- this part of this curve is going to give -- it's a cartoon. Obviously, if we dredged all of this material out, this will no longer be the basis for loading the river. It's going to be
something akin to the MNA curves. So we have extrapolated these lines out, say, okay, we think we are going to hit the MNA, the ideal solution some time around here.

In any case, we are still talking about relatively small differences in target, and certainly we would expect to be on the best curve, if you would, sometime around the year 2020, 2025. So we are not talking again about a significant delay in achieving this line, and we saw that when we ran the 350-nanogram-per-liter scenario, which is what you have in the handout for Tuesday, the 350-nanogram-per-liter scenario akin to this, and that hits the target a couple of years after completion of dredging. So we are extrapolating this last little bit by a couple of years, thinking that is essentially what we were looking at, so it's a difference.

So, again, what we see here is that there are no longer impacts even at twice the proposed standard, and that we are attaining the ideal curves soon after completion of the dredging.

So, to summarize, then, these slides, effective PCB concentrations on fish or validated PCB concentrations on fish due to dredging are short term and anticipated.
Phase 1 data showed small increases in fish body burden downstream of the dredging operation, and that is what our model predicted.

I didn't show you that data, but you actually have that data in your handout -- sorry -- in the original reports at Attachment 1C. So you look up yellow perch and black bass, and, actually, you probably can see the data if you want to look at it in there because they are collected in September. The black bass and yellow perch are collected in June, so you really don't have a full dredging impact there, but you do have pumpkinseed in September in the 180 River Mile, 184 Pool, and they show only a minor impact. I neglected to point it out before.

Modeling was completed to predict fish body burdens increasing after dredging for a range of concentrations, both the Upper and the Lower Rivers. We have examined the impacts of dredging on both sections of the river, and we continue to predict significant impacts to the Upper River based on the loads that we are proposing to release, on the scale that we are proposing to release, and in the Lower River certainly on the scales that we are proposing to release.
Forecasts indicate negligible changes in time to risk-based targets. We are talking about a couple of years delay, no more.

So, anyway, that concludes my discussion on the modeling. We have one more slide I am going to show you.

How am I doing for time?

**MS. HOLLAND:** You've got 20 minutes.

**MR. GARVEY:** Anyway, this last slide here, it is just a point of emphasis about the focus on the remedy and the existing footprint.

The ROD selected priority areas for dredging. That was the basic premise of the ROD, that we have already identified what we think is the absolute minimum area that we can remediate and anticipate the kinds of improvements that we are talking about.

When I do that, the remedy that has been selected, the REM/3/10/Selects, which those numbers refer to the inventory, 3 grams per square meter, 10 grams per square meter, are equivalent to 30 ppm, 90 ppm, and 90 ppm at the surface of the river. You got huge concentrations.

When you apply the kind of numbers that are in the Fox River, we'd be going bank to bank, everywhere, all the
way down to Troy. They are the kind of numbers that Fox River, you would be capping or dredging or something.

**MR. BRIDGES:** These are surficial concentrations?

**MR. GARVEY:** These are surficial concentrations.

**MR. BRIDGES:** Like surficial is defined as what?

**MR. GARVEY:** Top 12 inches.

**MR. BRIDGES:** Is that the finest resolution?

**MR. GARVEY:** We have data finer than that, but the standard is written that any concentration higher than -- sorry -- 10 ppm from the top 12 inches, anywhere, any interval.

**MR. BRIDGES:** Is that the practical definition of bioavailability is that anything in the top 12 inches is bioavailable?

**MR. GARVEY:** That is a rough approximation. That was the intention to ROD. These would potentially be the bioavailable, potentially could be eroded. The concentrations that we are talking about are hot, and as you have in a table that you see from GE, the materials that we are taking out in the Thompson Island Pool, for instance, are 22 ppm Tri+, about 50 ppm total PCB.

What we are leaving behind is still about -- I
think it's about 7 or 8 ppm on average, and that's the average of the other half of Thompson Pool, the other 40 percent. That's about 7 to 8 ppm total receiving.

The next pool down is Schuylerville Pool. What we're leaving behind is even hotter. We are talking about 7 ppm Tri+, about 15 ppm total, so that these numbers that we have picked, we are already picking the load. We are picking the best targets. This is what we think of as the minimum footprint that needed to be done to try to get the remedy we wanted.

One other thing to point out is that the reason this is called "3/10/Select" is that we apply a third criteria in the lower half of the Upper Hudson, the last 30 miles or so, which in that seven-step were buried by a foot or more of material at 5 ppm total PCB could stay in place. So, if we found inventory below a foot, that had one foot of relatively clean material, 1 ppm, 1/2 ppm Tri+, about 5 ppm total, it could stay.

So we have already identified inventory that we are going to leave in place, uncapped and unaddressed. We have identified the most contaminated in river surfaces as well as the most inventoried areas in the river and
identified the footprint, and we still come up with 500 acres to dredge in the Upper Hudson

So I think EPA's perspective on this is that we have really done the job of prioritizing the areas at the bottom of the river.

With that, I will end it with that.

**MR. CONETTA:** I just want to emphasize a couple things from what Ed just said about fish tissues impacts. We actually -- we keep talking about mile, and I will get into that in a minute, but we actually have data about what happens on this river with high releases. We have it in our report. It's the 1991 to '93 Allen Mill event.

We had concentrations much higher than what we saw in dredging, much higher than we have even shown you here today, and that information and data shows that this quickly drop out and go back to normal and start trajecting towards where they need to be within 1, 2, 3 years. So it's experience; it's data.

The other point I would like to make out is that you saw the concentrations at Waterford, what we saw this year, and below that, at Poughkeepsie, as you go down -- and
we have shown it before -- the concentrations in the river
didn't change from baseline. They were still the same. I
think it was around 25 at Poughkeepsie. There are no
impacts.

I think what we are showing is probably a very
worst-case scenario. I think there is experience from other
sites and projects even in the State Cumberland Bay where we
have seen fish go up after remediation and then come back
down. It is fully expected. It is not a surprise to us.

I mentioned modeling, and it is useful tool,
obviously, but we have used the modeling. I think we are
beyond that. I think we are into data gathering, and we
need to collect data. We will continue to collect data and
see and evaluate.

We have not set numbers based on a blind
assumption either. We have looked at risk. Even our number
as we proposed appears to have no impact on risk. The
short-term impacts are minimal. The long-term benefits of
the remedy, I think, are pretty significant.

We share, I think, Tim Thompson's concerns about
the modeling, what would have to happen to get us to agree.
We agree so well. I mean, it's just the process to get to
an agreement on this to me would seem -- and, again, we will likely look at information that GE supplies, but, you know, we have delayed enough. We need to get out in the river, and we need to continue dredging and clean up the site. We don't want another year delay. We need to get out there and do the project and clean up that river.

One other thing on the models, which I think comes up and it comes up in terms of uncertainties, we were wrong before. We underpredicted, our models underpredicted. It is likely that this model, as well as its calibrated, may likely underpredict. I mean, we have talked about what the right number is. I don't see how a model gives you the right number, okay.

I think what we have looked at is a comprehensive evaluation at least of what kind of risks are there, and I think that goes to some of the concerns that Todd and I think the panel had and has. We will continue to collect data, and we will be looking at the data to see what happens and occurs.

I think I would like to close out on a couple of notes about improvements, and I think, again this is to us the most critical issue about Phase 1. It was a shakedown.
We have heard that before. It wasn't a test. It was to learn and evaluate what happens in the field with these different situations that we will be put in.

Have we run through everything we probably will run across? Probably not, but we have learned a lot, and I think at the end of the day, we think there is a lot of improvements that can be made to help this process go better and smoother. We also look to your input on helping the process go.

One of the things that was mentioned yesterday is use of larger buckets. We used 5-yard buckets. One of the things we might want to think about is going even larger than that. That is something we can talk about.

Scow unloading, we still think is very important. We need to correct the scow unloading issues.

Minimize time dredged areas are open to CU. We agree with that. We have said that all along. These things were open all summer. That is not acceptable. Those have impacts to everything.

One of the things that I think -- and it is even in our field oversight report -- is the near-field monitoring. Obviously, Don showed you the TSS data. I
think there is a reason why we continue to believe why  
redistribution, while we have opposing views, it doesn't  
seem to be a big issue. It is something we need to maybe  
evaluate a little bit better, but it doesn't appear to be an  
issue as far as impacts.

The piece on PCBs, there is for near-field  
monitoring. I think what our approach is on that is to  
collect the data to help us understand what is happening in  
the near-field and relate it back to what operations are  
going on to see if we can correct things midstream daily, on  
a daily or weekly basis.

Monitoring diagnostics. We think this is a very  
important piece. You know, obviously, we have showed you  
the data. We have showed you what those intakes look like.  
We need to evaluate those intakes. We need to make sure  
that the data we are collecting not only at high flows but  
also during dredging are appropriate.

One of the things that had me scratching my head,  
and I think much of our group, is that when you had high  
hits at 600, 700 in the river during Phase 1, the duplicate  
sample was usually less than half of that. We can't explain  
that. So we think there is a lot of work to be done on it.
The original resuspension standard, while we think automated monitoring is important and it's a great way to go, in addition to manual monitoring and trying to develop an automated station, while you are doing both, while we did do some diagnostic tests during baseline, it didn't really check and evaluate the situations we would be under in Phase 1, and very little of that monitoring, while we have seen a lot of high flow data, only Waterford actually had high flow monitoring during baseline. Those numbers aren't terribly off from what we have seen in the past.

I think one of the biggest issues -- and you have heard from us -- addressed the DoC uncertainty. We need to do that for the project to be more successful.

One of the things we think you might be able to help us on is obviously the dredging tolerances and how they are written. I don't think anyone was happy on how they worded it. I think your input might be helpful, among other things that in your experience will give us

I like to refer to the field oversight report because I think, you know, sometimes, you know -- not that I am theoretical or whatever, I am not trying to make this an easy project, but our field team was out there with GE every
single day. We talked to them all the time. I was on those four o'clock calls while down in the city. We have written down a lot of issues where we think we can help this project proceed, go forward.

Just as a closing, you have seen this slide. I am not going to go through it too much. We think we can consistently and practically, with the proposed standards we have made, meet the standards simultaneously and consistently.

I think the 500 ppt has been mentioned a number of times. While it has been implied that we are going to get rid of it, we really aren't.

I think when we've looked at the data at Thompson Island and when you have those high hits at Thompson Island, you see that stations below that at Schuylerville, you are nowhere near 500. We are not getting rid of it, but it is also what do you need to do. Evaluate the situation that is going on, make a reasonable decision, and those water supply intakes and the people down at Waterford are not affected anymore, and they will not be doing dredging. That was the major perspective -- purpose for putting 500 up there.

Fixing Schuylerville, you have seen these slides,
I am not going to go through them again too much. We obviously think that if we can adapt the scow loads, reduce the amount of traffic -- I think someone mentioned yesterday a flotilla of boats -- that can't but have impacts on resuspension.

Do we need as many boats? Likely not. Do we need as many dredges? It depends on how the process goes forward and how we address it. Those are design issues, but some of your input on that would probably be very helpful for us.

One of the things I wanted to point out about the residual standard -- and I think some people mentioned it yesterday -- we don't believe it has been fully tested either. We think it worked because it enforced us and allowed us to take the inventory out of the river that needed to be removed. This is not just a mass removal project. We have looked at risk when we are doing our evaluations here.

Addressing DoC for more efficient dredging, we are absolutely -- we agree with GE. I think you guys agree as well. We want to get in and out quickly, but there is a process to get there. It isn't just let's dredge, take another sample, and see where we are, and cap it, whatever.
We have got to address that issue. It isn't dredge through debris, take cores all the way down, let's see what happens, and dredge again. We need to address those issues.

We think we did streamline the residuals, maybe not so much as you guys thought, but I am sure we will hear your recommendations on it. I will leave it.

I just again want to thank you all. We appreciate the time and effort you guys have taken. It is a lot of information. It has taken us months and months to go through it, and I can't imagine how long it is going to take you guys. It's a tight time frame, but we appreciate your efforts and your experience. Some of the things you have already mentioned yesterday were things we hadn't thought about in terms of throwing a thin veneer of sand down as you are going.

We had thought about closing things, but the other approach is also very interesting. I am sure you guys have some experience and ideas that we haven't thought about that will be helpful for the project moving forward.

I am just going to turn it over to Dave to see if he wanted to say anything in closing.

**MR. KING:** Yeah. Thanks, Ben. Dave King, EPA.
I don't want to take up much time, but I think what we have seen in the past 3 days, it's a commitment to positions both on EPA's part and GE's part. I think there is a lot of enthusiasm. There is a lot of passion associated with those positions. We have been living this for a long time.

But I think there is a lot more commonality other than might appear through these discussions. I think we obviously all agree on the benefits we are trying to achieve on this.

We work with GE team, particularly the field team, on a daily basis. We get along well, believe it or not, and you put 10 engineers in a room, and the first thing you are going to do is, okay, how are we going to fix this, and we do a lot of that. I encourage you to look at the field report because that is sort of where we came out after being in the field through Phase 1.

We have gone through this and word by word with the GE team. I am not going to say they are enthusiastically in support of everything we have in there, but it certainly gives us -- we have a lot of common agreement in that, and it gives us a place to continue on
with the design.

As these deliberations go forward, we have to continue getting down to the actual operational design changes that makes some sense to take advantage of what we have seen in Phase 1. So that is pretty much where I would like to leave it.

You know, we have talked a lot about adaptive management. That has to be the way we go. Every year, things are going to change. Every year, we are going to see something we didn't see before, and we are going to have to deal with it in the field, and then do good engineering.

I confess to being an engineer, and that is something that we have to continue to do. So, again, thank you for your time and efforts.

**MS. HOLLAND:** Thank you.

Paul, we have about 7, 8 more minutes. Do you want to do some more clarifying questions, or do you want to just take a break and then come back?

**MR. FUGLEVAND:** A couple of people had questions they wanted to ask. We can just take a couple minutes and do a couple clarifying questions before we break.

**MR. THOMPSON:** This is actually to Don.
So very interesting presentation. There are really two parts to my question. One is, what you addressed really deals with TSS and PCBs that were tied to total suspended solids. So Question 1 is, what do you think we need to do with the rest of that unassociated mass that apparently moved downstream? Then, two, how do we relate -- or your thoughts on GE's use of the sediment trap data to run numbers and suggest that this is a broader problem, we have a big redeposition problem of these PCBs, and that mass is going to continue to be a problem for a long time?

I think I explained what I wanted to.

MR. HAYES: I'll try to answer this. First, the -- sort of the first issue --

MS. HOLLAND: Give your name again. Sorry.

MR. HAYES: This is Don Hayes.

I think, first, we need to understand where, you know -- what is causing the significant dissolved signal downstream and where it's coming from, and I have some ideas, but I don't have any facts.

So, to me, that is the critical thing is -- and as I look at it and the role that I serve, these kind of projects, try to give people a realistic idea of what is
going to occur, I am very anxious to learn what's going on and why that is happening.

So, you know, how we take that -- and you notice I was very careful to not say that I didn't believe redeposition wasn't something we should be concerned about. I was just trying to explain where we started from.

We do have to figure out how this dissolved release downstream may affect redistribution downstream, and it may be that that is repartitioning back to solids and the ambient load and then settling. Maybe that is an issue, maybe not, but that is something we need to look at.

I don't have any bright ideas, haven't thought that through too much, but I am not proposing we dismiss redistribution. I just want to be sure you see what we were thinking in terms of the redistribution from solids. You know, it is a very limited extent. The dissolved release is a totally different issue.

I don't know if that answers your question. I am not sure what else I can say on that topic.

As far as GE's use of the sediment trap data, I can't really say much about it because I haven't studied it. I heard what John said on Tuesday, and, you know, just I
haven't been able to go back ask exactly which data did you use for what.

My point was when I looked at the sediment trap data, again, one of the things, we don't have a baseline. So we don't really know what that ambient load is, but if you are going to use it downstream, you need to consider what I showed you, and it would be erroneous to use the amounts in the early traps as a load that is going to be transported a long distance downstream, right, you know, because it's going down.

So, certainly, we see it going down, and if you take that and use a trajectory as to where that is headed, that might be a reasonable approach once we subtract something for what the baseline condition is.

So I can't say exactly what John did and so I can't really address that, but the PCBs in those traps, just to point out, were fairly hot. They were -- I believe in the first traps, the traps were about 90 milligrams per kilogram and went down to about 70 in the lower one. So there were very significant PCBs on those sediments.

Now, the trend is different from what you would expect, simply because you go downstream, because of the
segregation of particle size. You would expect that to be going up. So that implies to me that the baseline load probably is contributing some to dilute the PCBs in those latter traps.

You know, I would have to look. I only looked at those two. I didn't look at the others, so I don't know what they showed. So I would have to look at them more.

Used in the right way, they may be very useful.

MR. THOMPSON: And what facts would you need, Don, to look at the -- what kind of data do you think would be useful to help look at the dissolved load and how we can make sense of where that is going downstream?

MR. HAYES: Oh, good question.

You know, I have done -- I have sat down. When I looked at the data, I sat down and started to back all the calculations right on the dirt. That's what I do. You know, how did this happen. Wait, this is different from my hypothesis. You know, I have got to rethink this.

And the only way I could get the kind of loads we see is from that one. That's the only way that I could contribute it. Maybe there is another mechanism that I am not aware of, I am not thinking of, but that's sort of right
now the only one I could come up with.

    It would be interesting to take some of the sediment, maybe turn to the lab and look at it and try to do some things, see if we could generate, you know, similar things, but, you know, this is a little different.

    Again, hydrophobic contaminants. We think, oh, we know how to deal with that, right, and here we have data that seems to be contrary to that.

    I haven't had a chance to talk to John. Maybe he has some great ideas that suggest where these come from, but right now I don't, outside of NAPL.

    And I will say that when I was in the field, I saw change. I did ask and I did indicate that they were seen on a routine basis, and then, I believe, the last couple of days in the CDM oversight report -- I am not sure what role they played, but they had some photos and videos and things of change throughout. So that very likely could be the source.

**MS. HOLLAND:** We have about 2 more minutes, so just time for one more question.

**MR. BRIDGES:** Well, maybe -- well, to make an observation and see if Don can respond to it on this point,
so if it's -- I just pick -- if I pick a mid number, just so that the calculation is easy for me, right -- so, say .5 millimeters per day, if you say 100 days of dredging, you got 5 centimeters. The issue is what is the concentration of PCBs in that 5 centimeters of deposition and what is the spatial extent, not the sort of linear extent only.

You have got to have at least 2 dimensions to calculate an area, right, and the risk associated with that material is a function of the concentration. It may not seem like a whole lot of mass, but if you put all that now in the surficial layer -- and bioavailable to me is something that's in the first couple of centimeters, not what's in the top 12 inches -- that's where the business is going on.

This is a big issue, and I am going to direct this to my chair.

Something that really frustrates me about this is this redistribution is a critical issue, and, you know, I am not directing my criticism to Donnie, but he's doing something quick and dirty the day before? And we have been in this peer review since January, and our timeline is close to ending. And something as important as redistribution of
the material, I mean -- I am going to stop there because I am quite frustrated by that.

MS. HOLLAND: Paul, do you want to just end on that note?

MR. FUGLEVAND: I think it's a good time to end for our break now.

[Laughter.]

MS. HOLLAND: We are going to take a 15-minute break.

[Break taken.]

MS. HOLLAND: There was extra time to chat during the break, so we are starting back a little later.

So we have from now until 12:30, which is our lunch break. We only have an hour for lunch today, not an hour and a half.

Just a mention for any members of the public who did not turn in their written remarks through the panel yesterday, you can turn them in today, if you had some additional comments, because we do not have a public comment segment on the agenda today, but we will receive written comments. Give them to Alison out at the desk or Steve or myself.
Okay. Paul.

**Panel Deliberations**

**PANEL MEMBER:** Before you start, could I ask a clarifying question of EPA that I didn't get to ask before, or are you going to say let's just talk amongst ourselves?

**MR. FUGLEVAND:** No, we can go ahead and ask a couple clarifying, and then we can move into deliberation.

**PANEL MEMBER:** Okay. If you guys don't mind, I would like to. This goes to Ben and Ed.

So I did look back at the EPS, and I looked at the 600 grams per day, 350 nanograms per liter, and that was based on a 1-percent nominal export rate. Does that tie, that 1 percent nominal export rate -- is that your derivation of 1 percent that you use now to derive 2,000 kilograms as the total PCBs?

**MR. GARVEY:** No, it wouldn't because --

**PANEL MEMBER:** It does not, okay.

**MR. GARVEY:** Because, well --

**MS. HOLLAND:** Ed, give your name again. Sorry.

**MR. GARVEY:** Sorry. This is Ed Garvey.

No, the derivation is similar in its technique, but remember at the time of the performance standard, we
thought the inventory was 70,000 kilograms, not 115- or 150
to 200,000 kilograms. So the derivation is similar, but 350
nanograms per liter would not be -- would be less than 1
percent.

**PANEL MEMBER:** Okay. That was it. Thank you.

**MR. FUGLEVAND:** So now the panel is going to
basically move into a deliberation stage of discussing
amongst ourselves, and we are not anticipating. We may have
a few clarifying questions but expect most of the time will
just be deliberation with the panel.

**PANEL MEMBER:** I don't about the rest of you, but
I am deliberating.

[Laughter.]

**PANEL MEMBER:** Well, you are deliberate, if
nothing else.

**MR. HARTMAN:** A brief start at a kickoff, the
model discussion that Mr. Connolly presented, an issue that
we do need some near-dredging data to verify the model. Is
that something -- when is that done? What is that data
collected?

**MR. FUGLEVAND:** You say how can we validate the
model if you don't have any data that --
MR. HARTMAN: Yeah, it's pretty -- you apply the model unless you have got the data required, I guess.

MR. FUGLEVAND: I think part of what we talked about yesterday is the multiple different ways of dredging that we think can have a real impact on how much release you have. Like if you dredge the thalweg that gets high velocity and more scouring versus if you start at one end and systematically work your way down, how can you evaluate near-field unless you have data that shows how those different practices impact release?

Yes, I think that's a very valid question.

MR. HARTMAN: I guess I am saying that because I think that the model is a great tool, but what's the action plan if it was going to be a -- if GE is going to apply the model, what is the action plan to get the data?

PANEL MEMBER: Don't know.

MR. THOMPSON: Yeah. It seems like one of the important things that GE has put in front of us is the need to have this model, and I don't mean to suggest that from my comments yesterday that I am disparaging the preeminent modeling company in the country, because, actually, I do believe that.
MR. BRIDGES: Why did you repeat that?

MR. THOMPSON: Only to irritate you.

[Laughter.]

MR. THOMPSON: Which is a secondary goal of mine as we go on through the day.

No, I have certainly worked with and across the table from QEA for many, many years, so I have a great deal of respect for their ability to put the models together, but I think there just still is a process that we need to go through. There is this sort of review process, and then there is this, I think, very important data process that Greg and Paul just alluded to as well that I don't think we are capturing. We couldn't possibly. They couldn't capture all of the elements that are associated with dredging or changes to dredging practices in that model at this point in time.

So a question to the group is, well, right now we have a number. We have a number that says 1,200, and Todd and I were contrasting presidents here. I felt a little bit like Richard Nixon was up there going, "Trust me, I have a good number," and Todd took the Reaganesque approach of truth --
MR. BRIDGES: Trust but verify.

MR. THOMPSON: Trust but verify, which I think is equally important. But we are not going to have those numbers. We are going to have a set of some relative black box numbers unless we want to go deep into the model sometime in June, and how important is that, how would you use that information?

So you seem to have felt the strongest about the need to do that --

MR. BRIDGES: Right.

PANEL MEMBER: -- so let's have that discussion.

MR. BRIDGES: Right. Well, I mean, yeah, that's the first issue that is, you know, what we will say with respect to the value of the approach. You know, what I see as the value, setting aside the practicalities of interorganizational coordination, which is not -- I don't consider that to be my problem. I mean, it just isn't.

PANEL MEMBER: But it is a problem.

MR. BRIDGES: Well, it is a problem, but it ain't my problem. I don't own every problem in the universe. I own a subset of problems.

MR. FOX: It's the time problem, and that's an
issue here.

MR. BRIDGES: Right, I understand, but I am not saying it isn't a problem. It is a problem. It just isn't my problem.

Making progress in life in general, that's one of the first things you have to do is distinguish your problems from other people's problems, but the value I see in it is in the -- as an operational tool to help guide what I think -- Phase 2 is as scheduled, 5 times longer than Phase 1. I have every confidence that there are going to be a number of surprises that are going to be encountered during Phase 2. There is no reason whatsoever not to expect that that is going to be the case. Stuff is going to happen, and they are going to be challenged with the need to understand what the surprise is and how it influences their adjustments.

Unless they want to take an "every other year off" kind of approach, you know, if they encounter something very troubling, then they have to have something operational that allows them to process information relatively quickly, as I said yesterday, something in a closer to more real-time mode, and all I am viewing the model is not as a black box that provides a -- models do not make decisions. That's a
mischaracterization and cartoon of modeling.

They help people organize otherwise complex information streams, and it should always be in a transparent fashion, not as a black box. You know, you don't turn a crank out pops, you know -- otherwise, you could just have monkeys run these projects, right?

So help organize the information. so that people can say, you know, given our understanding how the universe is working, you know, this is the rational action we should take. That is the value that I see in it, and I just don't -- my view is that it's not really the panel's purview to comment on organizational logistics with respect to how two groups will coordinate in working out the development of the tool or how, you know.

MR. MAGAR: Let's also be clear. Both teams are using a model.

PANEL MEMBER: That's fair.

MR. MAGAR: I mean, when we saw one model has this level of correlation, which if this is the correlation we need --

MR. BRIDGES: I want that graph to go up there, because I want to talk about that graph.
MR. MAGAR: If that is the correlation we need, then I think we can do a lot better than that. I mean, so that -- but there is a lot being inferred by these models, and I think that really would be disappointing to see us still in this competing models. There is so much more knowledge and understanding of modeling frameworks that we could -- "we" as an engineering community can really come together on, on single models, and many more of our projects are going to a single model that both teams are agreeing to.

So I would agree with you. I mean, I think there is a lot of utility in something that has a much better or more accurate prediction.

This is a lot weighted on the model answers. I am not sure if it's the right tool to give us a single number, be it 1,200 or 2,000, and I kind of agree with Tim. I am going to be hard-pressed to see that that is a statistically significant difference downstream, or I would like that to be demonstrated, but I think it's an operational tool that would be very helpful.

MR. BRIDGES: Essentially, I mean, you are using -- my feeling is you are using it as a decision support aid to engineering basically. Like that's what I view its value
as.

PANEL MEMBER: Right.

MR. FOX: I see a lot of value in such a model that concurrence can be gained on, but I just have a lot of doubt.

I mean, you hear the presentations and the back-and-forth and the distrust. I mean, I hate saying it, but, you know, that's really what I am concerned about.

MR. BRIDGES: In terms of the implications that has, whether or not they can get it together enough to --

PANEL MEMBER: Yes.

PANEL MEMBER: Oh.

MR. FUGLEVAND: Yeah. I think we heard the comment in February about Mars and Venus, and we are possibly talking about a model from Mars and a model from Venus, and that may not get us anywhere either.

MR. BRIDGES: At least half of the marriages in this country do not end in divorce.

[Laughter.]

MR. BRIDGES: So there is a way to bring Mars and Venus together, I think, successfully.

MR. THOMPSON: It's called a "shotgun."
[Laughter.]

MR. BRIDGES: It is 50-50.

PANEL MEMBER: There is an interesting recommendation.

MR. BRIDGES: It is a 50-50 thing, which kind of resonates with something that was said earlier, but where is -- if this is up there, do people mind if we talk about this for a second?

MR. FUGLEVAND: Do you need the pointer?

PANEL MEMBER: I have a pointer.

PANEL MEMBER: There's actually a pointer on the changer too.

MR. BRIDGES: Because this really struck me when we looked at this graph this morning, and I think the characterization of it was that, you know, we are not doing too bad. I think that was Ed's characterization: we are not doing too bad.

But what struck me about it was not so much the scatter, per se, but, if you just looked at the slopes of the lines that you could draw or if you wanted to apply the statistics to them -- so here is the modeled slope here. So, if you just looked at black sea bass, you know, here is
my fair representation of the stuff, you know, or if you looked at the blue -- now, this one is obviously set out. You know, I don't know what that data is, but, nevertheless, the blue line clearly has got a steeper slope than the model line.

Now, the perch is close. Okay. So there are differences among these species. So, you know, one of the implications here is if you look at these different slopes and, you know, the sort of implied Y intercepts and such, that, you know, the model could be substantially -- just based on this dataset here, the model could be substantially underestimating the rate of recovery in fish tissue, right?

And the implications for that are that I think considerable -- with respect to, you know, how you would compare the dredging scenario and recovery, you know, trajectory and how much -- I mean, that's big, in my mind, and in terms of how you would -- what the limit should be on resuspension and load --

MR. SCHROEDER: Well, yes, I agree with you there too, but it was my suggestion redeposition is not as important because if I recontaminate some other areas with this small amount of mass, they recover very quickly.
MR. MAGAR: I would be cautious even to read too much into this.

I reflect on what you said, Todd, about rushing through data and doing this the night before, because what I heard is that this is combining fish from the entire river. I don't know if fish is separated by -- so that is a really big area -- if fish is being separated by weight, by --

PANEL MEMBER: Age.

PANEL MEMBER: -- by age.

PANEL MEMBER: Lipids.

MR. MAGAR: I mean, there are so many variables, and we know that because we tease out fish data. It is very complicated where you are just grouping it into some big amalgam of fish that, you know, it may be representative. I don't know. I mean, I think that is 40 miles of river to look at trends.

What I do see is that the model predicted a downward trend, and the fish are showing a downward trend, and a stronger correlation to anything like that, then, more than that I would not read into this.

And that's maybe a good thing, and I think that is the message that EPA was trying to deliver, but to then say
that the model that does a good job, I mean, I think Ed took
that a step further. So, therefore, the model is doing a
good job of telling us what's happening? I don't see that
it is really predicting much more than a downward trend.

    MR. BRIDGES: Right. I guess, you know, I take
what Paul is saying.

    My point is that the reality, whatever the
reality is, with regard to measured data to the projected, I
agree with you that this doesn't show good correspondence,
at least not for a billion-dollar project.

    PANEL MEMBER: Right.

    MR. BRIDGES: That's my assessment.

    But, you know, then if I look further and try to
see, well, there are certainly -- there is evidence here to
suggest there could be substantially different slopes, rates
that would be consequential, and I want to understand what
the implications are for resuspension and release and
residuals -- because I think that is the crux of the load
standard is this right here, right? The argument, I mean,
at least in part. So I don't know --

    MR. THOMPSON: But, if I hear what you are
suggesting over yesterday and today, your preference would
be to wait, not do any additional work in the river until such time as you had agreement on the model, you ran the model, you let the resuspension standard be set by the model, which is essentially GE's proposal, but that there is going to be the time lag. And you would be okay with that, because that does impact what we say.

**MR. BRIDGES:** Well, I don't accept the premise that there wouldn't necessarily be a further delay in dredging. You are trying to make me own that problem, and I am not going to accept that right now.

I am just saying I don't accept the premise that I would -- you know, that I would the delay of another year, so that they come to agreement on the basis of the operational modeling tool that they would use.

**MR. THOMPSON:** All right. Well, I will go a step to say I perceive that you do own it. I perceive that that is why I echoed it. It is exactly what you are suggesting, and that does create us a problem, because we don't have the issues that Greg and Paul worked out from an engineering standpoint. They don't have agreement, but I am not disagreeing with the utility of the model.

I wonder whether it would be fine to go out in the
next season of dredging, use the standards that EPA has, the
resuspension standards that EPA has proposed, collect the
data that's needed to be able to evaluate that, while it's
simultaneously developing a model, and then reexamine this
issue again.

I am not suggesting the model shouldn't be
developed. I am just saying if you don't go and work, if
you have to wait for that model, there is a time delay. I
will own that problem. I will own it. I believe that's the
case.

MR. MAGAR: I think we said yesterday that there
is more than enough to do, that I think they should be able
to start some work. I mean, I agree.

MR. HARTMAN: Just what you are saying there is
that they have to get data, but is it relative, is it
relevant? Yeah, I think it still is, but literally go out
now and get the data in the 5-month period here,
representative of the time, and collect that, what we will
call in the future, "near-dredge" or "near-field sampling,"
collect that and continue to collect their data downstream,
at least with the model they are developing, it has then got
a -- not a baseline but at least a non-dredging year in the
data.

I guess I am just suggesting they have to go out and get that, start getting that data now, not wait until they start to work again next year.

MR. FUGLEVAND: The other thing I was struck at by just reviewing the Phase 1 reports and reviewing the earlier performance standards reports is how much things changed from the perception to what actually happened and kind of this ongoing discovery of discovering what we don't know, and I think that is kind of a long-standing process.

You know, at what point do you reach kind of the classic analysis paralysis? Because the more we look, the more we are going to find we don't know, and I think that is a real thing we have to wrestle with, because I think it's very valid to go out and pursue better models that better quantify all the issues, that help make, you know, better analytical decisions, but, at the same time in doing it, we are pretty well assured that the more we investigate, the more we are going to discover that we don't know, just like we did in the last 4 or 5 years.

I think that is part of what we have to wrestle with is you can make the point right now that the whole load
standard is based on -- what we see now is some real questionable modeling that didn't really account for all the factors.

I mean, we heard Don say that, you know, I can't understand why the PCBs are in the dissolve phase, except for maybe NAPL, and we don't understand the NAPL. And so the part of the issue is -- and how do you get to a decision to move ahead and what do you move ahead on.

**MR. BRIDGES:** Well, that is where I think I am going to use the phrase "adaptive management," because that really -- that is the remedy for uncertainty, right, and the mode, the traditional mode of do all your analysis, don't take any action, and then once you think you are 100-percent complete on your analysis, then you take action, that doesn't work in the real world as a point of fact. And I guess you could argue that's why, you know, Superfund projects take, you know, as long as they take, you know, in respects. Decades.

**MR. MAGAR:** You could see what we have done almost as kind of a hypothesis. Testing, then, that hypothesis has been changing. So I will think back to where we were in 2003 and 2004, and, you know, effectively, we saw a lot of
this monitoring in this program as kind of a hypothesis
testing program or an experiment to validate the model that
had been developed or the understanding of how the system is
working, and that's changed.

And part of the change, GE is proposing a
different view, a different hypothesis, and I do think it is
worth now taking the time to test that and to use this new
model. I think this is exactly as you are saying, using --
managing this adaptably. This can be done in real time. It
does not mean we have to resolve the model over 2 years.

Mr. Bridges: Right. And you are using this
framework as a quantitative framework to inform this
adaptive management approach.

And I guess I heard Tim opening the door up to the
idea that maybe these things could be merged in concert with
one another. It doesn't have to be an either/or.

Panel Member: Absolutely.

Mr. Bridges: And I think that is something that
we could explore on further discussions, with the one
cautions in mind that what I call the "oops factor" is really
high with dredging, and what I mean by that is that if
something bad happens while you are doing it, like you
released a lot and you didn't really understand it and this
oil is going everywhere just as a scenario, you don't get to
just "Okay. Well, we will redo that," right? That's what I
mean the oops factor. You don't get to redo. You did it.
It's done, right? There is no recovery, except for now we
will go clean that up for whatever, unlike, you know,
backfill. If that's not getting the job done, you can
always go put more on, you know what I mean? I mean, it
doesn't have as high an oops factor associated with it.

So, I am feeling a little -- I need to look more
at the information and data because there are these, what I
call these gaps in the mass balance of where did the PCB go.
That causes me some, you know, hesitation, I guess, about
proceed fully with Phase 2, maybe something that is more
scaled back at the beginning of Phase 2 to try to get a
better grip on some of these issues because honestly my --

MR. THOMPSON: So you are saying son of Phase 1?

MR. BRIDGES: Well, no. No, I am not saying that.
I just -- something more to scale, because, ultimately, I am
concerned about -- I want to minimize regret. That's
probably my biggest concern.

You know, maybe it does sound odd to some people
to think that my environmental concerns run very deep in my
consciousness, and I want to minimize oops; that is, that
you get the best recovery possible and it's not "Well, you
know, we thought we were going to get recovery in 10 years,
but it looks like it is going to be 60." That is my
concern, is to minimize that kind of regret scenario.

MR. SCHROEDER: I can see your concern there, and
I think there is a lot of very simple reality checks in
terms of what potential for what we are going to be doing
will -- what kind of impacts and what range of impacts can
happen.

I mean, we can look at what a quality of PCBs or
bioavailable mass of PCBs in the Upper Harbor -- I mean
Upper River area and compare that to that our oops factors
could be and see how we could change this.

I mean, I can tell you, you know, in the short
term, what kind of increases you might see or what kind of
bad things that can happen, how bad can it get. I mean, I
think we can, you know, look at those kind of issues. I
think we can say, "Well, we can proceed. We know we have
got bass situations in certain areas, and there is no reason
not to proceed," and the question is, you know, how much
control should we place on this to do this as best as possible.

Ultimately, it is what kind of controls should we place in order to make sure that our oops factor is minimized as much as possible.

**MR. BRIDGES:** Well, what that is my interpretation of EPS are designed to achieve, right?

**PANEL MEMBER:** Right.

**MR. BRIDGES:** Certainly, it is to minimize, you know, hazards to the desired outcome.

**MR. MAGAR:** And yet I think where we find ourselves is caught between anther zero-sum game. You know, that is essentially what has been established, and what you critiqued of Superfund that can make it take so long because there is so much at stake at a single decision -- and I agree. I like this adaptive management approach because it's not -- if we are focusing on a single number, whether it's 1,200 or 2,000, I think that is too shortsighted that we can find one single number that just tells us what we should be achieving for the river.

That's, I think, why both sides are -- now there
is so much tension because there is so much at stake with
now that single decision, and maybe there is an adaptive
decision that we can manage through the project and figure
out what is happening and what the benefits are. Maybe it
is every other year. I don't know. I mean, maybe it is a
slower process.

MR. BRIDGES: I guess one of the values I see in
having this quantitative framework, model or whatever, that
this quantitative framework, that you should be able to
minimize the lag between information gained and conclusions
drawn, right, in terms of implications for the project as
you proceed. That is why I think of it as an operational
tool.

MR. THOMPSON: I don't think anybody is
disagreeing with that. It is really, operationally, how do
you put it in place --

MR. BRIDGES: Right.

MR. THOMPSON: -- what do we have to go through,
what do we have to give up now in order to get it in place.
I don't think that anybody is going to be -- certainly on
the EPA side is going to be ready to walk in and say, "Yeah,
we will accept this. We will use it." They will want to go
very carefully through that.

So, to me, again, agreeing with you that is a very good tool, a tool that probably should be developed, I don't see any reason to forego the next season of dredging, just if for no other reason those data are necessary to be able to help make that operational tool the right tool.

**MR. FUGLEVAND:** The only question, Tim, I have on jumping to next year is does the experience from Phase 1 have enough surprises in it that it is time to step back and understand the surprises before you jump again. I mean, one of the issues is NAPL. The other issue is more releases than expected, what is happening in the near-field redeposition, and is it significant or not.

I think the experience of not only these past three days but the past few months is the opinions are widely divergent, and they haven't clarified. We haven't, I don't think in my mind, come to a real clear understanding of "yes, it is an issue" or not. It is just like it sits out there, and so what do we talk about?

We talk about a model, but the real issue is -- is on the oops factor -- is trying to do everything they could possibly during Phase 1 to do a well-managed, controlled
They still had releases that are not yet understood, and if the releases are significant and of concern, should we figure them out before we go again, or are they not that significant, and if they are not, proceed ahead. And I think that is part of the question, is are they significant or not, do they demand a model, or are they just -- they weren't really that big of a deal?

MR. FOX: I don't think we know, and I think we need to kind of proceed cautiously, so we can collect the right information to answer the question. That's the opinion that I have.

MR. BRIDGES: This is all over Charge -- I mean, this is Charge Question 4, I think, in a sense.

PANEL MEMBER: Right.

MR. FUGLEVAND: Yeah.

MR. BRIDGES: And I think sort of my thinking at the moment is that what needs to happen the next time they are out in the river in Phase 2 is the monitoring needs to be structured in a way that they can answer these specific kinds of questions where they have gaps.

I mean, I would want, if they are still
struggling, encourage them to continue to look at the data that they have in hand now, and I think this modeling will aid in that, in developing hypotheses, but the monitoring when they are back in the river again needs to answer some of these specific questions.

And I have kind of written down, you know, a phased approach to Phase 2 kind of thing, where the next time they are out in the river, they need to test specific things or evaluate and collect data regarding these specific kind of processes.

MR. FOX: Well -- and I think there are some operational improvements that everyone agrees to that --

MR. BRIDGES: Sure.

MR. FOX: -- would improve upon the Phase 1 experience and give us better data. Even if we are collecting the right data, I think it would give us better data.

PANEL MEMBER: Yes.

MR. THOMPSON: I want to point out something I said yesterday, and I think it still pertains to this as well. If we still have this tension between productivity in terms of the time and, of course, the resuspension and the
residual, I think we are presented with two very starkly
different proposals right now for both groups.

One would be to relax the productivity standard,
take more time to get it done, lower releases, find
different ways of exploring of how we might do the dredging
differently. I am sure there is a great team GE has put
together here. I am sure if productivity was a less
emphasis, they would probably very cleverly think of the
ways to do things differently.

The flip side of it is, if you are going to
enforce the productivity standard and you say you have
really got to get this done in 5 years, well, then they have
to do it exactly the way that they did it, and then I would
agree with you. You hit that point in time and say, well,
then the only way you have faith in the data we see right
now, you are going to have to remove less in order to be
control the resuspension events, or at least based on what
we have seen.

**MR. SCHROEDER:** Or relax the resuspension
standard.

**MR. THOMPSON:** Well, yeah, or relax the
resuspension standard to infinity and beyond, to quote Buzz
Lightyear.

**MR. SCHROEDER:** Well, I mean, there is the question about whether or not the resuspension standard is a significant risk measure -- I mean control already.

I mean, we had the new model runs, in essence, shown this morning, you know, from the EPA's models that --

**MR. THOMPSON:** Those weren't new. Those are old.

**MR. SCHROEDER:** Well, newly presented to us.

**PANEL MEMBER:** Yeah, okay.

**MR. SCHROEDER:** Certainly, open to interpretation as to what it shows, but, you know, I would tend to say it didn't show that it delayed or affected things greatly.

**MR. FUGLEVAND:** I was struck by the same thing, that they ran the model. Right now 680 is they are proposing for Tri+ as a load. They ran it for 1,200, and in the same amount of time, it comes right back to baseline.

And so it kind of made me think, well, where is the tipping point, because I don't see -- from there, I don't see a tipping point where if you go beyond that, it is adverse. It just seemed like to be -- it was a short-term impact and begged the question what is the purpose of the load standard. If you even double it, it doesn't show a
long-term adverse impact.

MR. MAGAR: Well, that starts to tell me that might just be an artifact of the model too. I don't know how to test that.

MR. FOX: Yeah. I would like to see the GE version of that, where they doubled the load.

MR. SCHROEDER: I mean, it is consistent with the recovery we have often seen associated with dredging in terms of fish tissue that it spikes, much as it shows you here, and several years later, it is back to what it was.

So the real question is have you really affected the long-term water column concentration or not, which means have you really changed the bioavailable mass in the sediment bed which is affecting that, and the suggestion here is that we don't really change it very much.

MR. BRIDGES: Well, I will tell you one thing that doesn't make sense to me about this plot, and that is why you can vary the release by a factor of 2, but it converges to the very same point in time.

If your fish are getting all their exposure through the water, you know, and continual exposure, a reservoir of continuing exposure in the bed that is not
present, then maybe I could see how you would get that, but I don't think that's reality.

**MR. SCHROEDER:** Well, if this is all caused by deposition, in essence, and burial of the layer of redeposited material, so the burial rate is not being changed, the concentration on the material burying this is not being changed -- so, if it takes 6 years to bury the bioactive zone, then it goes away in the same period of time.

**MR. BRIDGES:** Right. I would like to know -- well, it would be interesting to know if there are datasets in the real world where you could actually test that outcome there, that it doesn't matter how much load you get, you are basically going to come down to the baseline, the MNR recovery line at exactly the same point in time.

**MR. SCHROEDER:** Well, it is not exactly the same point.

**MR. BRIDGES:** Well, it is pretty darn close. I mean, it's pretty darn close.

**MR. FUGLEVAND:** One of the other things that I heard them talk about was that -- I think the EPA said the PCB reservoir mass is so high in the Lower River anyhow that
this doesn't really -- you add the stuff from the Upper River and you don't overpower it. And that's why we see that they are not getting down to the desired risk-based targets. You know, just the load that is just in the Lower Hudson already is significant, and it would take a lot more to basically overwhelm that.

MR. SCHROEDER: I would like to say also, you know, we see slight differences, but this is on a log scale, and so it is not very easy to see what is the real difference.

MR. BRIDGES: Could you say that again? I wasn't paying attention to you.

[Laughter.]

MR. SCHROEDER: What I am saying is that this is a log scale for concentration. So, at points, they look very close, you know, become farther apart, in essence, within the scale.

MR. BRIDGES: Well, I would submit that within the uncertainty of those models are the same point. I note your observation.

MR. SCHROEDER: The uncertainty applies to all of the different cases.
MR. BRIDGES: I know.

MR. SCHROEDER: So, this is, again, the mean of the uncertainties.

MR. BRIDGES: Of course, this just applies to the Lower River.

MR. FUGLEVAND: But then this becomes significant when we consider, in particular, GE's proposal, that it is a hard number, that 1,200 that they are talking about is hard and not to be exceeded.

To me, this data seems to be that it is not a hard and fast tipping point as far as down-river impacts go. It doesn't give the feel of a very dramatic impact if you even double it.

MR. MAGAR: This is why I have been asking for and continuing on this rant about wanting to understand what this means for surface sediments.

You know, if this is suspended matter that is hitting Waterford and it is passing by, a lot of that suspended matter is going to disperse and move on into a much larger system and virtually disappear, especially in a short time frame that we are working.

But what then become important is how much of that
is settling out and becoming part of the sediment mass and part of the bioavailability.

Some of the short-term peaks that we see and we have seen in the Grasse River, we have seen them in the Duwamish -- I think the Grasse River was looking at -- they had about a 2-year time frame of response, Duwamish is closer to 7 and is still in response, so these 5- to 7-year time frames are probably not unreasonable, thinking about response dredging in terms of practical data that we have.

I mean, that's, I think, one place where the modeling will help, and I think just talking about it in terms of 1,200 kilograms or 2,000 kilograms are just metrics that I can't make sense of, and I won't be able to make a judgment on which one or if either are correct.

I am not really sure, I am not confident that there is just one zero-sum final number, that that is the only number that we can accept.

The natural recovery process will include a process of redeposition after there is some impact to the surface sediment as well, and that is a process that hasn't been thought through.

I think just the scale or when you think of the
density of cells that are in the old model compared to what we are capable of doing and the bathymetry and the information we have now, just in terms of the sedimentation process, separating that from the biological uptake, I would have much greater confidence in this new model in terms of understanding sedimentation processes and where some of that material is going.

**MR. BRIDGES:** This curve to me -- I mean, I can understand the logic, I think, that is represented in the approach that EPA is proposing right now, if it is based on, say, a conviction about this figure, right? I mean, I can get that.

The point to me is the vulnerability of the position is that it really depends on how accurate the right side of that recovery curve is, right? That is, if that extends a lot longer or there are big distinctions in how long you would get recovery at a given load, you know, then it becomes more difficult to support a specific load for the Lower River.

I mean, based on what I have seen of the curves, there is really no benefit to the Lower River. That is kind of my read on it. I mean, you have to believe in very fine
distinctions in those recovery curves at long distances.

So, you know, the issue is the load standards based on, well, how big a harm are we willing to tolerate to the Lower River, and I just don't -- I am not saying you can't put together a plausible hypothesis for why these things all kind of converge at the same point, so that the humps are really not that much bigger across those variations in load, but I don't know.

There are alternative hypotheses, I think, that could operate, given like the sediment distribution -- I mean the surface concentration that would make those curves different in terms of the lag, how long the recovery would happen, depending upon load.

MR. THOMPSON: We had a lot of discussion. I was sitting here reflecting, this is a lot of what we talked about in 2003.

MR. BRIDGES: And what was your conclusion then?

MR. THOMPSON: I don't think we ended up -- at that time, we decided this was the best available tool and that Phase 1 was going to have to be an effort to go see to what degree.

MR. BRIDGES: And that is no longer true, right,
that's not the best available tool?

MR. SCHROEDER: I believe I concur with what you said, Todd, regarding that there is not much of an improvement on the Lower River, and that so maybe we are focusing too much on the Lower River and should be looking at what impacts are we having on the Upper River.

MR. BRIDGES: Yeah. That's right.

MR. THOMPSON: Well, I have got to come back to, at the end of the day, our charge is -- at least with regards to the resuspension standard, is to say we have got a one-and-a-half-times difference between the two, and we don't really have a way of assessing at this point in time because I don't personally believe that the model would be ready to evaluate dredging impacts at this point in time.

So, to me, I just think what we have already talked about in terms of the modeling and that maybe it's time to move on to some of the other topics, or at least I think so, is this adaptive management.

I could easily recommend that they develop the model, but they need to go out and work with the standards, that I think, again, that EPA has proposed right now, for better or worse, but I am not endorsing them as saying they
are the right values. I am just saying that there are a set of standards that have been thought through.

Then, as a group, again, recommend -- well, if we are not going to recommend the productivity change and relax that, then we really need to think about recommending that they don't do as much.

But, at this point in time, we don't have that model, Todd. So at least not -- we do have the model. We don't have it in place, that it is really just a black box to us. It's not beyond that. We could argue until we are blue in the face, and we did that in 2003 over these, whether it was the right model. I am not sure we are going to gain anything more at this time.

**MR. SCHROEDER:** I support your position there, and so the question is -- it is sort of like the one we sort of discussed yesterday afternoon. Is there a different productivity schedule you would need in order to do this in the manner which we think would be best, going from upstream to downstream, you know, ensure that we always do that, ensure that we are always able to backfill without being recontaminated or -- you know, and what schedule and product length would that take?
I mean, we can take that approach and say maybe we should revise productivity, so that the rest of the project can be done as environmentally friendly as possible. I mean, is that what we should be doing?

MR. FUGLEVAND: Twenty years?

MR. THOMPSON: Maybe the first place to start is let's just say, for the sake of discussion, the productivity standard in terms of 5 years is really not achievable, at least within what we understand the ROD to be.

Then that focuses back, really, I think more on residual and closing these CUs as quickly as possible.

I don't think anybody will disagree the less number of buckets in the water, the lower resuspension level we would have.

I am just going to put out the group that in 2003, I thought EPA's position for dredging these units, the complicated method they produced then was untenable, unsupportable, and just too difficult to implement. And I don't see a substantive change.

Yes, I am making a very strong opinion, I agree, Paul. I saw that look.

MR. FUGLEVAND: I was thinking -- oh, you are
talking about the residual standard?

MR. THOMPSON: I am now moving to the residual standard, that's exactly right, as a means of getting less numbers of buckets in the water.

I think that I have to absolutely say that this is consistent. GE's proposal is consistent with the 2003 recommendation, getting clear depth of cut down, and I wouldn't be satisfied, to be honest with you, even with high-confidence areas. I would want to go back and do that.

PANEL MEMBER: I agree with that.

MR. THOMPSON: I would want to have cores. Absolutely, every core needs to go to clay. I want to know where that is, and I want to characterize all the way to the bottom, because by doing that, dredge once, cover it, and then decide do you have to put on backfill or do you have to do a cap.

Getting less buckets in the water, keeping that closed as fast as possible, to me, that is the right way to get this done.

PANEL MEMBER: Right.

MR. THOMPSON: I would like to hear your guys' opinion on that.
MR. FOX: And then layer upon that the analysis we need to determine whether the near-field and far-field loads matter.

PANEL MEMBER: They're not anymore.

MR. FUGLEVAND: The dredging was kind of almost robotics, almost, you know, you think about laser-guided equipment. Could you imagine you are going to do -- somebody is going to do a robotic surgery on your brain, and you only know the position of your head within 2 feet, and here comes this great, big drill, you think --

[Laughter.]

MR. BRIDGES: Well, for some people, it wouldn't really matter.

MR. FUGLEVAND: If they're big enough.

MR. MAGAR: I do like the medical analogies, the first one, arm was bleeding, and now someone is drilling into our head.

MR. FUGLEVAND: But, I mean, this idea of a computer model, train model that is accurate to the centimeter that drives the dredge, when even the good core recoveries, you know, 700-percent recovery on a 4-foot core, you have still got 12 inches of uncertainty, and I think
that whole issue of the sampling method is real, that if we want to have certainty on the depth of cut line, we'd have to have certainty on our cores, and I think even the kind of the good cores weren't great.

So that idea of going out -- and if we want to implement a method that is real efficient in the field, the dredge gets in and gets out, we have to know where we are going to first. I think that drives the need for an improved depth of contamination.

And I don't think any of us are saying go out and characterize the next 5 years of dredging in the next 2 months. You are saying just be ahead of the dredge. You could be dredging, coring the same season, just ahead of the dredge if you need to.

MR. FOX: Right. If we get good cores, we can do the modeling, and then we can determine what our risk is of what we are leaving behind, and then we can manage that risk.

In this project, we have the advantage of having backfill and/or capping over every dredge area, and that's a good way to manage risk. So we can make a decision on what's a potential risk at certain concentrations and does
that need to be managed permanently with an armored cap or
with the backfill.

MR. THOMPSON: Do not go out with those Vibracores
again.

[Laughter.]

PANEL MEMBER: Say that in the mic.

MR. THOMPSON: Do not go out with those
Rossfelder-type Vibracores again. They are not efficient
units for this system. They have their place, but this is
just not it.

MR. BRIDGES: Well, I guess the unstated question
maybe isn't why aren't they out doing that right now.

It seems to me that both GE and EPA acknowledged
the depth of contamination as a problem. I think I heard GE
say that they were open to discussing with EPA going out and
collecting more cores, but, as granddad used to say,
"Daylight's burning."

MR. MAGAR: We have to be careful that -- there is
a limit to how much we can resolve or get that much
precision with it, you know. You even said it as you were
talking, Paul, that there is still a lot of uncertainty.

The best we are doing is a core that is a distance
from about where I am sitting to the doors there. In between, we simply don't know that much of what is happening --

**PANEL MEMBER:** That's true.

**MR. MAGAR:** -- and I think that's why GE is saying, you know, let's do our best estimate. And there are some high-confidence areas that both agree to. I don't think we need to reopen those areas.

There is an acknowledgment to focus, even by GE this morning, to address the low-confidence areas, so I think that is a very good step forward. Set the cut lines, but that is why, set the cut lines, dredge, backfill and move on to the next unit.

**MR. FOX:** I disagree. I disagree with you on several points.

One is the need to dredge to get good data is assuming we can't get good core recoveries, and I think we can do that, because you are not really going to change the density of your data, and so your model is -- your errors in the interpolation in between.

If we get good recoveries and have a good model, then we can get an understanding of the variogram and the
nugget effect that John Kern was talking about. That's the risk that I am talking about being able to manage.

I can understand keeping data in high-confidence areas, but I would redefine the high confidence, and I wouldn't define it the way that I have heard is high confidence.

I mean, I am not disagreeing with you 100 percent but just 98.

[Laughter.]

MR. MAGAR: Thank you, Rick. I agree with you 2 percent.

[Laughter.]

MR. SCHROEDER: I somewhat question, you know, how we would be using -- I mean how they would necessarily use the data or what impact it would ultimately have.

I mean, the idea here is to close the CUs faster, you know, if we had high-confidence, well-known, established depth of contamination.

This sort of goes to, well, yes, if we have a much better estimate, I mean, we are still not going to be, you know, precise, but we are going to be closer. But if we are going to dredge to what we think it is the depth of
contamination and then verify that we actually did hit it
still, you are open during that verification process. Then
you go and you grab what you find that you missed, and then
you go close it, perhaps, or else you test again.

But let's say we close it. Okay. So that's the
process. Okay. That's the process that I guess GE would be
proposing, more or less.

The process I guess that EPA proposes would be
that you set your depth of contamination or you determine
it, you know, hopefully with high precision or high-
confidence cores, and then you add 9 inches or whatever, and
you dredge it, and then you test if again. So, you still --
you know, maybe now you have hit it and then you close it.

Before, maybe you hit it, you know, 50 percent of
the time and then you closed it, and the other 50 percent of
time, you go on and do it again.

So the question is how much have we sped up the
process. In one case, we speed it up maybe -- I don't know
what percent of the time we are going to, you know, increase
the success. I think we have more precision. There is
probably more than what we saw in the presentations Tuesday,
you know, which sort of said that there would not be a lot
of impact if we did all this overdredging except that we
would have a lot more material to process and dispose of,
and so we don't want to do that.

   So I question, I guess, where we get there much
   faster.

    PANEL MEMBER: Doing what?

    MR. SCHROEDER: If we actually go out and try to
    better characterize the depth of contamination.

    MR. FOX: Well, my thought was better characterize
    it, define depth of cut, and then use that to implement the
    project. Go out, dig to that, grab a sample to see whether
    you are going to cap or cover, and move immediately into
    that.

    It wouldn't be cyclic. It would be -- because it
    has to do with what Rick said about risk management, if we
    were going to leave it clean -- and I think what we are
    carrying along with us is a 2002 image of dredging that when
    we are done, it is like this floor, it's clean. So, with
    that image, your focus is keep doing it until it's clean,
    and what we have learned on many sites is that the residuals
    are real. And so now we are talking a different way to
    manage residuals, and that is, we know we are going to have
residuals, we know we are going to have elevated chemistry, and since this project already has backfill, we already have a risk way to deal with it.

So it is not as important that we get every scoop. So, by digging to a cut line that we predetermined with data we feel good about, we know we are going to miss some things, but because we have the cap or the backfill to manage that, we are not going to spend as much time chasing it. And that's the big time savings, is we are going to get mass out, we are going to target 90 percent instead of 100 percent, and we are going to have this backfill cap as the risk management component.

The only reason to sample it is to say do we have to have a cap for isolation or do we just need backfill, and so then we eliminate several cycles and all of a sudden we have a much more efficient project.

**MR. SCHROEDER:** Right. I concur. I mean, that's exactly -- if we are going to modify the residual standard to basically say cut the known depth of contamination and then we will either backfill or cap afterwards, then, by all means, that's great. I mean that's -- we need to go out there and we need to identify the true depth of
contamination right off, and we gain a lot from it.

But that's -- I mean, if we don't change the residual standard to basically allow that, I don't know if we come out ahead much if we go out and do additional depth of contamination.

**MR. FUGLEVAND:** And I think you maybe have answered the question why isn't GE out there doing coring right now. Because if the residual standard isn't changed, they go out and spend a bunch of money coring, and they may not get any benefit from it.

**PANEL MEMBER:** Right.

**MR. FUGLEVAND:** So I think that may be one of the reasons is, is there is tradeoffs, and they don't want to just --

**MR. BRIDGES:** Right. This gets to the incentives issue, because it is different, what we have been talking about doing of dredging to a defined cut, and then you either take cores immediately then or you backfill and then take cores, which allows you to kind of confirm that you got your backfill the way you wanted it, send those off to analysis and the dredge works on, and then you determine after the fact whether or not you need to go back and add
sufficient to make that a cap instead of a backfill. That
that scheme then maybe places more emphasis on being more
precise in the delineation of depth of contamination.
That's a different motivation for use of that data than the
-- which I think is unnecessarily complicated, really kind
of -- well, Phase 1, it was unworkable I think, right? I
mean pretty much.

MR. MAGAR: Well, the residuals didn't get to the
low numbers that they were targeting.

MR. BRIDGES: Phase 2, EPA has modified something,
but it still had these lags that will no doubt exist in
terms of analyzing and "Well, are we interpreting the core
right?" I would expect there would still be substantial
lags and reaching closure beyond what we have been talking
about doing, just backfill when you are done.

MR. FOX: The first step is making the decision
that we are going to get rid of the "do loops." That is a
real first step, and then we can get into a situation where
we are closing the CUs, which is what our recommendation is,
and then we are talking about how do we do that, because I
look at these depth of contamination determination as what's
the tolerance for the risk of leaving stuff behind that we
are going to manage, and so how much definition do we need that. And I would guess that EPA would want a very good
determination, you know, maybe a tradeoff is some
over-dredge requirement on that.

You know, I don't necessarily support it right now, but, you know, perhaps the statistics in a model that is informed by better data would bear that out.

**MR. SCHROEDER:** I find that the selection of areas to remediate, that there was the 3/10/Select criteria, and one of the Select criteria would allow the higher contaminant concentrations, you know, as long as the top foot was relatively clean.

So they have already -- basically have adopted a position of tolerating a certain amount of mass at higher concentration being left as long as it is not considered bioavailable --

**PANEL MEMBER:** In the top foot.

**MR. SCHROEDER:** -- in the top foot.

Of course, we are putting on a backfill cap that is supposed to meet that same objective of having low concentrations and stability.

**PANEL MEMBER:** Yeah.
MR. MAGAR: This goes a little bit to the incentives, but I wanted to just comment on something Paul said.

I actually liked a lot the way you had phrased and expressed our understanding of this.

At one point, you said we might be at a level of accepting or targeting 90 percent, and I don't think we would want to target 90 percent. We are going to target 100 percent but accept 90 percent --

MR. FUGLEVAND: Right, right.

MR. MAGAR: -- and I think that is kind of an important distinction.

I think that goes to what you are saying too, Rick, where maybe we agree in more than just 2 percent, that we can actually target better. We can get to really have 100-percent target.

I am not a big fan of the over-dredging or overcut, because, you know, we are moving the stuff to Texas. We are spending a lot of money and energy and expending a lot of resources to transport this material and to remove it from the environment. I don't think that we want to just take extra, even if it's -- well, what I
calculate it was about 100,000 based on the 32 percent,
based on EPA's calculations. Based on GE's, it might be up
to 300,000. It's a lot of material.

MR. FOX: I agree with you on that. I just bring
that out as a potential.

PANEL MEMBER: Yeah.

MR. BRIDGES: Well, It sounds kind of like a blind
-- yeah, it's not a very satisfying approach.

MR. SCHROEDER: And I agree, Victor, that when I
said 90 percent, I meant target 100, but not have to get
100. You could accept a lower percentage like the 90.

MR. MAGAR: But realizing you are doing brain
surgery with a dredge head.

PANEL MEMBER: That's right. That's right. Leave
a little gray matter behind.

MR. THOMPSON: As a question to Greg and Paul, I
would think if we would recommend that they go to this type
of dig and immediately cap approach, it is going to be
really, really important you go upstream to downstream,
relatively small cells.

MR. HARTMAN: And getting much better
characterization, the depth. The boring is the key to what
we are talking about too. It is just so obvious.

MR. THOMPSON: Yeah. Because you wouldn't want to have to keep on digging and putting a cap on, only to have some other areas upstream that you are working on recontaminate that.

PANEL MEMBER: Right. Exactly.

MR. FOX: It does seem that, you know, by phasing this in and trying to get a handle on how important these near-term effects are is very critical because, you know, I could see in one scenario where you feel like as long as we get the cover on in, say, a one-week period, we are okay. Then you could see dredges out ahead maybe and sort of leap-frogging multiple dredges, but another scenario, if you feel like to have to cover it, as Paul maybe was suggesting where we cover it immediately as the dredge goes, then all the dredges have to be in a line moving down the river at the same time, and that seems a little untenable.

Really, this release, the effects of the release are critical in figuring that out.

MR. SCHROEDER: Well, I probably would suggest, maybe not exactly a full cap. I would suggest stabilizing the residuals --
PANEL MEMBER: Right.

MR. SCHROEDER: -- you know, a partial cap layer down early, so that only that might get recontaminated, and you again put a sufficient material above that to capture anything else later.

MR. FUGLEVAND: I could see the adaptive management approach where the next year they dredge, we have these near-field transects, and we are not just doing a near-field transect where we have dredged. We are now going to be doing some near-field transects in areas we have exposed, and maybe we don't plan to get them all covered the day behind the dredge, but maybe we are gathering some data now, so that we can see from an exposed area, we are gathering some data, how much are we releasing. And if we say, "Wow! Look at that," it is just spiking all over the place, we say, oh, there would be a real benefit or say it's moderate and 2 or 3 weeks is a reasonable thing, then we could say the plan is to advance the dredges in a way that we could then come back in a few weeks.

So I could see some near-field transects, though, really informing a lot, especially the transect on areas that have been dredged but not yet backfilled.
MR. BRIDGES: Yeah. On this point, it occurred to me that, you know, these recovery curves and such of the base load and resuspension standards and things are based on an understanding of processes that the data in Phase 1 indicate they don't understand or that there are significant gaps there.

PANEL MEMBER: Right.

MR. BRIDGES: Right? So that's the first cautionary tale with regard to, you know, acting and believing the curves here, because there are clearly releases going on that should affect that understanding represented by those curves.

So I think the operation load we are talking about now, in the next cycle, I think needs to be associated, getting to Question 4, with much more intensive monitoring, much more than what they are recommending now to fill these gaps.

Now, if they get satisfactory resolution of these issues in that next cycle, they might be able to back off that entirely, right?

PANEL MEMBER: Yeah.

MR. BRIDGES: So it wouldn't be this is the
monitoring regime forever more. In an adaptive management mode, maybe you do that then. You have settled those issues, and then it's a dramatic scale-back perhaps in monitoring that would be for subsequent cycles if they have addressed those issues.

**MR. FOX:** Well, there is two types of monitoring. One is monitoring toward where we think the EPS are to ensure the protection, but then there is also additional monitoring in order to inform the adaptive management, which means refining those, and you need the DQOs and you have to go through that process, so you understand, you know.

One of my learned RPM colleagues from Region 5 rants, gets up on the table sometimes, and says, "I just hate collecting data that is not used." And when you really take a step back and think about what are we trying to accomplish when we collect this datapoint, sort of what you were saying, Paul.

**MR. BRIDGES:** Not to bring up the modeling subject again, but that's one thing I think that making progress on the modeling between now and when they are out next time would allow them to be very specific and precise about hypotheses that need to be tested and the DQOs for setting
that monitoring plan in the next cycle. Otherwise, I kind
of take in guesses, more or less.

   **MR. THOMPSON:** This group did set DQOs. They have
got a great document. They did a good job on that, but they
set it based on what the expectations were. So I don't want
anybody to say they didn't do data quality objectives. If
you need to, I will show you where the document is.

   **MR. BRIDGES:** No, no, no. I didn't say they
didn't do them, but they have got new information now.

   **PANEL MEMBER:** That's right.

   **MR. BRIDGES:** And I think that is one of the
values that modeling provides is to be able to inform your
understanding of where the gaps are and what data you would
need to help inform another DQO process for subsequent
monitoring.

   **MR. FOX:** Okay. I was on Tim's side on the model.
Now I am officially independent. I'm Joe Lieberman.

   [Laughter.]

   **MR. FUGLEVAND:** So which side are you going to
caucus with?

   **MR. BRIDGES:** Whoever has the power.

   **MR. FOX:** Matter of convenience.
MR. THOMPSON: In his case, whoever has the beer.

[Laughter.]

MR. MAGAR: I want to circle back to this idea of incentives, and I think, Tim, as you are working around your thinking of this, this is what I heard from what you were saying, that you were trying to capture this idea of incentives. And this 5-year time limit seems to me to be really impacting the incentives and factors very strongly, and I think it may have been for good reason. I can understand EPA might have wanted to have some limit, and even GE, with respect to the public and the impact to the public, and I think that is an important factor to consider because this is going to be a project. It is a project that is impacting the community here.

But, outside of that, I don't know if it really provides any additional value, and we have heard, in one sense, that there is a -- I am just trying to think through this as I think aloud.

But we have a load limit that we are trying to achieve, and I haven't heard yet that it makes a difference whether or not that load limit is reached in 3 years, 5 years or 8 years. I think that all I have heard is that
there is a load limit that is very important.

I think that because of these different computing incentives, this short time frame is creating an incentive that conflicts very much with some of the other environmental controls, which are to get a relatively clean bottom in the Upper River and to minimize release in the Lower River.

It kind of goes to what you were saying earlier this morning. If you have competing incentives, that it may be too difficult to try and resolve through those. So I guess, you know, I am seeing an opportunity maybe to -- I don't know how to relax the 5-year goal without, you know -- we don't want it to be 10 years.

I do believe there is a natural incentive and there will be for GE to do this as quickly and efficiently as possible. That just comes as a matter of course because, as a cliche, time is money, and in that case, the longer it takes, the more that they will be spending. So there is just kind of a natural incentive for them to try and compress this as much as possible.

**MR. FUGLEVAND:** I think too, Victor, the idea of incentive plays out to how quickly it is realistically
implemented, regardless of the 5-year schedule, that if either party feels like it is not a satisfactory outcome, there is going to be a lot of process that will just take more time.

And I think the idea too of remedies that provide a win-win result in dramatic clean-ups, and I think the Lower Fox is a good example where in just watching that project, it was originally a mass removal project, and there was a lot of resistance. And as it moved and evolved, it became truly much more of a hybrid solution, and we are seeing active, every year "getting her done" kind of work happening and hearing good things from both sides.

So I think the Engineering Performance Standards, as modified, can function as, in essence, a win-win for both sides on the balance and help actually move to a real completed project.

**MR. FOX:** And I think the key incentive for doing this project is trying to remove the do-loop from dredging. That, to me -- and that's what we are working on, on a depth to management on the Fox right now. How can we do that? How can we create an acceptable risk surface once the dredge went by and get out of the do-loop? That is what we
are talking about here on this project.

**MR. BRIDGES:** I think we also need to keep in mind that with regard to the resuspension release, there is now the orientation in the EPA proposed standards, even the previous standards, it was all focused on the Lower River, and I am also -- and I am sure they are as well, but I am particularly interested also in shrinking the recovery time in the Upper River where all this activity is going on.

And I think to be able to do that, you have to explicitly and directly address resuspension, the effect that resuspension and release is going to have on the Upper River because that, in fact, is where the effect will be greatest, you know, because of the fact that's where you are operating, right?

**MR. MAGAR:** There is a pretty large portion in the Upper River where you do have -- it looks to me like almost bank-to-bank dredging. Yeah.

So there is one portion where perhaps that could be relaxed in anticipation of moving downstream, but I definitely agree with you. Absolutely, once you get beyond that bank-to-bank dredging area and you start to influence or have a potential influence on areas that won't be
dredged, that becomes that much more --

MR. BRIDGES: In my observation, there is a long distance between even the next phase and Waterford. I mean, that is a big tract of space.

PANEL MEMBER: Yeah.

MR. BRIDGES: And, again, getting back to this point that the data seem to indicate that there is not a satisfactory understanding of all the release mechanisms that are occurring right now -- and the ramifications of that uncertainty are most dramatic for the Upper River, I think. I mean, it's just logical that that is the case because you are going to have the biggest impact on the near-field; in this case, the Upper River.

MR. FOX: Well, I think the data we have collected bears that out.

MR. BRIDGES: Currently, as I interpret the proposal from EPA, there is not a -- you know, the orientation of the standards is all Lower River focused as opposed to -- I mean GE -- now GE is proposing to develop a standard which considers the effect on the Upper River, but they want to do modeling, and we wouldn't be getting that until June.
MR. MAGAR: So here is the engineering side of me, is how are we -- where is this going to lead us in terms of informing how we are managing the site, because -- and how are we controlling those releases, and maybe that is part of the incentive side.

I don't know if any of us have great confidence in silk curtains or in cofferdams or things like that.

I mean, it kind of comes back to this 1-percent concept, and you were saying why not .9 or why not 1.1. And what I have heard both sites say, if not directly, somewhat indirectly, is that 1 percent or maybe it's 1.6, but there is just a practical limit to how much you are just going to be able to reduce your release.

You are not going to get it down to .1 percent, and it won't be 10 percent. And I think our technology -- and you gentlemen can speak probably better to what is practical, and if we can get it down to 1, maybe we are at 2 or 3 percent. And this is 1 percent down at Waterford, which tells us that the percentages are probably much higher being released at the dredge head.

But, after you have achieved that, then you might as well -- I mean, is there a value in monitoring and
telling us -- you know, spending a lot of time and resources
in just proving that it's 1 percent when --

PANEL MEMBER: No, no.

MR. MAGAR: That is kind of what I was saying
before, 1 percent is 1 percent. So then is there a limit to
dredging, or is there a limit to how much you can release,
or how else are we going to --

MR. BRIDGES: I hear you, I hear you, and I agree
with your point there. You know, there are practical limits
to how low you can go, but what are you going to manage it?

MR. MAGAR: Well, that is a very good question.

MR. BRIDGES: Okay. So that is my point, do you
need to manage it and how would you do that, well, you have
got to know what the process -- you know, what is generating
it and where is it going, right, to be able to formulate a
management approach that you could factor in to the EPS to
address that.

I guess that is my point, you know. It's not just
let's monitor it and get it to whether or not it should be
1.1. It's just you have to develop -- the EPS are basically
engineering management practices for managing your operation
and the risks associated with your operation.
There are just gaps in that now, and because the orientation has been the Lower River -- and I am not taking exception with the fact that there needs to be concern about the Lower River, but there is recovery in the Upper River as well that should be addressed by the standard.

MR. FUGLEVAND: And I would like to talk a little bit more to that and to that criteria, the REM-3/10/Select, and it says is uses effectively 30, 90, 90 milligram per kilogram criteria. Can anybody explain to me what that means?

PANEL MEMBER: I'd have to go back and look again.

MR. FUGLEVAND: Because part of the impression I had was that in the areas -- in these tables we got, in the areas outside of the area to be dredged -- this is like Table 3, and if you look at total PCBs within the dredged areas, we see average -- and this is zero to 2 inches. We are seeing average concentrations in areas to be dredged ranging from typically 10 to 50 parts per million. What does it say? The Phase 1 average is 83. We talk about the non-dredged area is 7.3. So, outside the area to be dredged it is still not pristine. We are still talking on the order of 5 to 10 parts per million.
MR. FOX: Can we have Ben or Ed answer that?

MR. FUGLEVAND: What's that?

MR. FOX: Can we have Ben or Ed answer that and clarify that for us?

MR. FUGLEVAND: This was calculations provided by -- I thought it was from GE, this table.

PANEL MEMBER: Or GE. I don't care.

MR. FUGLEVAND: Can somebody explain to us what the REM-3/10/Select means as far as identifying areas?

In this table that we have, it says the average concentration within selected areas was -- on a total PCB basis was 57, and outside was 7 parts per million.

MS. BENAMAN: I can answer --

MS. HOLLAND: Jennifer, please give your name.

MS. BENAMAN: This is Jennifer Benaman. I can answer the 30, 90, 90 question.

MR. FUGLEVAND: Okay.

MS. BENAMAN: Your question in regards to Table 3 is -- can you repeat it again, please?

MR. FUGLEVAND: Well, in Phase 2, how did you select the areas to be dredged? It is apparently based on something called "REM-3/10/Select."
MS. BENAMAN: Right.

MR. FUGLEVAND: And how was REM-3/10/Select applied?

MS. BENAMAN: Yeah.

So REM-3/10/Select in the -- are you just interested in below Reach 8, or do you want for the whole river? For Thompson Island Pool, at Reach 8, we used two criteria, and the area to be dredged -- or an area was targeted to be dredged if it met either of these criteria.

So, first, we calculated a mass per-unit area based on a core that is the whole core's profile. So that was 3 grams per meter squared in Thompson Island Pool Tri+ PCBs, 3 Tri+ grams per meter squared.

We also looked at the top 12 inches of every core, and if anywhere in the top 12 inches we exceeded, met or exceeded 10 milligrams per kilogram of Tri+, then it was also targeted for dredging.

MR. FUGLEVAND: In the top foot, was it usually subsectioned? I think it is like 2 inches.

MS. BENAMAN: Right. But all -- most cores, the majority of the cores have zero to 2-inch, and then we have 2 to 12, some 2 to 6, 6 to 12, and then some 2 to 24.
MR. FUGLEVAND: Okay.

MS. BENAMAN: When you get below Thompson Island Pool, we then use -- this is the 10 of the 3/10/Select -- 10 grams per meter squared, Tri+ PCBs in an MPA criteria, and the surface, so the top 12 inches, anywhere in the top 12 inches, that was 30 milligrams per kilogram Tri+ was targeted for dredging.

Then the Select refers to the third bullet there, the sequester, the inventory remaining in River Section 3. So anything that was perhaps meeting the criteria but the PCBs were buried, we could leave behind, but that was done only when it was clustered. So, when we had a cluster of points that we say met the Select criteria, although they might meet the criteria for dredging, those PCBs were buried, and there were a number of cores in that area that met that. We would then pull off his course and not target them for dredging.

MR. FUGLEVAND: So one of the questions would be in Phase 2, where the surface criteria, is it 10? Was it 10? Instead of 3, it's 10?

MS. BENAMAN: Phase 2 doesn't necessarily pay attention to the reaches in the way that REM-3/10/Select
did, so Phase 2 stretches throughout Thompson Island Pool, and then it goes into the Lower reaches as well. So those criteria that I just explained applied to Phase 2 in the different area.

I think 60 of the CUs are in Thompson Island Pool. So 60 of the 100 certification units are in Thompson Island Pool. The other 40 are in the lower reaches.

MR. FUGLEVAND: Okay.

MS. BENAMAN: So the 3 grams per meter squared, 10 ppm Tri+ criteria would apply to the 60 CUs in Thompson Island Pool.

MR. FUGLEVAND: Okay.

MR. THOMPSON: Just to be clear, this is what is defined in the ROD, correct?

MS. BENAMAN: Correct. This is what is defined in the ROD.

MR. FUGLEVAND: So any other clarification from Ed on that?

MR. GARVEY: Yeah, just one.
MS. HOLLAND: I think it's on. It may be just that he needs to turn it, unless you've muted it.

MR. GARVEY: It should be on now.

MS. HOLLAND: The EPA mic? Yeah, that one is live.

MR. GARVEY: This is Ed Garvey.

The only point of clarification, although Jennifer has it right, basically -- and to get to the point about the 30, 90, 90, typically, in the sediments because of dechlorination, the total PCB number is about three times the Tri+. So that it's two-thirds mono and di, one-third Tri is the mixture. So 10 ppm becomes a 30 ppm sample, and that was, in fact, borne out by the samples collected throughout GE's work in collecting all the cores. So that is where that comes from.

The one other point, because we use both surface sediment and inventory as setting criteria, so either one or the other governs, in the table that GE gave you, you will see that the average concentration to Tri+ is 22 inside the footprint for Phase 2, for instance. In the Thompson Island Pool and outside, it's about 6 or 7, and that's because you can met MPA values that are over the 3 grams per squared
meter or the 10 grams per squared meter that don't meet the
surface criteria. So you have both of them. So it tends to
pull the average below these thresholds, so to speak, but it
will pull it both.

The average concentration of what we are dredging
may be less than the equivalent to 10 ppm. It's about the
case in the Thompson Island Pool, but for the River Sections
2 and 3 in particular, the average concentration of the
surface sediments in River Section 3 that we are dredging is
less than the 30 ppm or 90 ppm total, because the MPA was
hot enough to pull the core in.

MR. FUGLEVAND: Okay.

MR. GARVEY: All right.

MR. FUGLEVAND: So then if we can look at these
tables, I want to look at a table that we got from GE
yesterday. It's called "Simulation of Redeposition, Current
Assumptions."

It's the second one from the back, and I haven't
studied it a lot, but what it sounds like, average, this is
PCB mass in top 1.6 inches of the sediment bed after
completion of the Phase 2 program, and they are talking
something on the order of 2 parts per million.
To me, 2 parts per million, if the redeposition is 2 parts per million, but the average concentration in non-dredged areas is 7, then -- because if you look at the second table, we got Table 3. It says the average concentration in non-dredged areas is 7 parts per million total. Then I almost say is there an impact from redeposition if redeposition is depositing something that is 2 parts per million on top of something that is 7. It almost sounds like natural recovery.

So maybe John could speak to that. Am I reading the data correctly?

**MR. CONNOLLY:** This is John Connolly.

Let me clarify. The 2 parts per million that you see there is the model's predicted concentration at the end of dredging in non-dredged area, so, in the year 2016, with no redeposition. So the redeposition impact would be what is depositing in areas that on average are 2 parts per million.

So, if you are depositing -- if redeposition is laying down something that is greater than 2 parts per million, it will cause an increase over what is there.

**MR. FUGLEVAND:** Okay. So did you -- yesterday,
you talked about a calculation. You had estimated the concentration of the redeposition material.

MR. CONNOLLY: Yes.

MR. FUGLEVAND: Is that here?

MR. CONNOLLY: Yes. If you go to what is listed as Step 3 -- and what you see on the right there, the 4.4 and the 14.3, the 4.4 is if the 2,800 kilograms of theoretical redeposition deposited in the area that is listed under A in No. 2, which if you go to the middle column is 2,228 acres -- and it would raise the concentration by a factor of 4.4, which means that after the redeposition, the concentration would be 4.4 times 2.

So we are talking about 9 parts per million in the top two layers of the model, which are nominally 2 inches but average about 1.6 because the surface layer grows and shrinks.

Then the second scenario where everything deposits in fine sediment areas rather than throughout the river, if you look at middle column in No. 2, that is 347 acres under the B scenario. So, there, the average concentration with no redeposition is 1.9, and depositing the 2,800 kilograms less the fraction that would have gotten taken out in the
fine sediment areas that got dredged -- so if you look in the B, in Row 3, you see there is a .47 times 2,800. So only 47 percent of the 2,800 is assumed to go into fine sediments that were not going to be dredged; 53 percent would have gone into sediments that would have been dredged and so don't count.

But the factor there turns out to be 14.3. So, there, if it all wound up in depositional zones, we increase the concentration from 1.9 to about 28 parts per million.

MR. FUGLEVAND: Okay. I understand that.

So, then one more follow-up question. So, then if we apply REM-3/10/Select over areas that we already know have whatever it is, an average concentration, would REM-3/10/Select trigger -- if you were to kind of start fresh, would it trigger this redeposition areas into being areas requiring dredging under the ROD?

MR. CONNOLLY: That is very difficult to say, but if -- and these are total PCB numbers. The number I just told you, going from 1.9 to maybe 28 on a total basis, would not trigger you if the number was 30.

MR. FUGLEVAND: Okay. That was part of my kind of thought was does redeposition -- what kind of net impact
does it have on the site if the rest of the area is already
pretty high numbers to start with, and then I was curious
whether it would trigger, under the ROD, a requirement for
cleanup.

The fact that it doesn't makes me wonder -- the
ROD already made a decision on a level that they wanted to
see action at. Does it -- I mean, if we are doing a cleanup
like at the Fox and if you had areas that if you got over, I
guess, 1, you would have to take action.

And if you found out that redeposition was coming
in at .8 everywhere, would you have a concern about this
redeposition from a sediment perspective?

MR. BRIDGES: But their scheme is much more
complicated than, you know --

PANEL MEMBER: Than 1?

MR. BRIDGES: Well, it strikes me as much more
complicated; that is, there is some logic or calculus behind
it that is related to risk but also related to getting mass
out. So, once you have modified the inventory by all this
dredging, I am not sure the same prioritization scheme would
make any sense at all. I mean, unless somebody can disagree
with me about that, but --
MR. FUGLEVAND: I don't know either. I was just trying to put the redeposition into perspective on what is still at the site.

MR. BRIDGES: As they indicated, I mean, they are concerned about concentration, it seems, but they concerned about mass at the same time. So they were trying to achieve several different objectives at the same time with the prioritization, and it seems to me if you pulled -- you know, you take everything out, but now you have redistributed such, I don't think the original logic applies. There is a basis for prioritizing what you do after that.

MR. FUGLEVAND: So where has logic applied?

MR. BRIDGES: Huh?

MR. FUGLEVAND: I said, so where has logic applied?

MR. FOX: Just to answer your question, though, you know, from an ecological perspective, it may matter even though the ROD made a decision. If we are adding more potential mass, then that can get into the fish. I mean, I just wanted to say that. I know you know that.

On the Fox, you know, just to tie that up too, is
we do have a surface-weighted average concentration goal of .25. So, if we overwhelm the non-dredge areas, then we will not hit that goal.

MR. FUGLEVAND: I was just struck by the average area of concentration is 7 parts per million. Outside of the dredged areas, it is already, you know, high by a lot of standards.

PANEL MEMBER: Yes.

PANEL MEMBER: Especially from your left coast.

PANEL MEMBER: That's right.

PANEL MEMBER: Yeah, but they are going to claim clean down to nanogram quantities out there.

PANEL MEMBER: That's right.

PANEL MEMBER: You think I'm joking.

PANEL MEMBER: No, I know.

MS. HOLLAND: We have about 22 minutes until lunch, unless you want to break early for lunch.

PANEL MEMBER: I wouldn't mind, just to regroup a little bit, but I'll go with the group. I wouldn't mind breaking for lunch early, just to regroup and think about it, but I can also go, if people still have burning questions.
**MS. HOLLAND:** Oh, they can talk until lunch gets ready, but yeah. The caterers are probably feeding you at noon.

**MR. FUGLEVAND:** No mas?

**PANEL MEMBER:** No mas.

[Laughter.]

**PANEL MEMBER:** Thank you, Roberto.

**MR. FUGLEVAND:** So you want to break now --

**PANEL MEMBER:** Yeah, that would be fine.

**MR. FUGLEVAND:** -- and come back at 1:30?

**PANEL MEMBER:** I think it's a good break time.

**PANEL MEMBER:** I want to think a little bit about what I've got here in front of me.

**PANEL MEMBER:** So we have a 1-hour break?

**MS. HOLLAND:** We have 1 hour scheduled. If you want to take longer, you can. It just depends on how much deliberation you want.

**MR. FUGLEVAND:** Any preference?

**PANEL MEMBER:** 1:30.

**MR. FUGLEVAND:** Take 1:15.

**MS. HOLLAND:** 1:15. Returning at 1:15.

[Luncheon break taken.]
Panel Deliberations (continued)

MR. FUGLEVAND: I think our plan is to deliberate now until -- we have now until 3:30 for deliberation, and so we will use that time.

So we can just open it back up and continue where we left off.

PANEL MEMBER: Is that enough time?

MR. FUGLEVAND: What's that?

PANEL MEMBER: Is 15 minutes going to be enough for the end?

[Pause.]

MR. FUGLEVAND: We are going to go ahead and continue deliberating, and our goal will be to -- we're shooting for three o'clock to get that wrapped up, and then what we want to do is there may be some things that we are saying or that one party or another has said that may invite -- you guys may be chomping at the bit to want to add some perspective on. So we would like to give each of you just 5 minutes at the end to hit any key points you think you want us to hear.

Again, there's been more discussions today, so maybe around 5 minutes at the end to kind of say, "Well,
make sure you pay attention to these three or four points."

[Pause.]

**MS. HOLLAND:** Too much lunch?

[Laughter.]

**PANEL MEMBER:** We're just well deliberated.

**MR. FUGLEVAND:** We're deliberating.

[Pause.]

**MR. BRIDGES:** Well, as an extension of the conversation that Victor and I were having over tuna, one of the complications in the project is that you have these tradeoffs that you have to settle, and I made reference to the fact that sometimes when you're doing this, you can end up with perverse incentive structures emerge.

And one of the things that I'm going to tag Victor with is bringing up the need for maybe simplifying that structure some, and I'm basically inviting Victor to describe what his thoughts were about this, not that I want to distance myself from his ideas or anything, because I thought there was a lot of merit, but he's been quiet over there.

**MR. MAGAR:** That's right. I was --

**MR. BRIDGES:** You were trying to frame how you
were going to say it.

**MR. MAGAR:** No. I was just going through some numbers, the calculations that we had gone through. I'll come back to that in a little bit.

Well, I'd be careful to -- I'll be more careful in the language I use. I don't really like the idea to even have an inference of perverse incentives, but I do think incentives -- or I liked how John Haggard put it this morning. I think he talked about accountability, and part of what I heard from his talk was a lot about the accountability that is owed to the public and to the environment in terms of making sure that this is done well, that we actually have some level of risk reduction and certainly don't make things worse than we would have as we began.

But I also think accountability goes -- you know, we can look at accountability for EPA, we can look at accountability for GE. I had asked the question before, and I don't mean it to sound off key, but, you know, about like what would you do if GE did not achieve this goal or would you fine them or something. I certainly don't want to imply or suggest that we should get into that kind of relationship
or behavior.

But these incentives are really difficult. I think that figuring out incentives to do this job well -- and I do believe that there's been very strong incentives already to think GE and everybody has wanted to do them well -- and to achieve these goals, how are we setting goals, how are they being employed, and how is that going to adjust behavior as we're moving forward.

I think one of the factors that seems to me to be complicating this a lot is the productivity goal. It is setting ourselves to a 5-year limit.

As I mentioned before, I think there is going to be a natural incentive for both -- well, I do think there is an incentive for GE to try and do this quickly because I think that incentive is going to be cost.

There is another limit, and I'm not sure where it varies. Is there an incentive for EPA to not let this go on endlessly? I mean, it's almost there is a productivity, there is a benefit to saying there has to be some end point, you can't just make us go resample or wait or delay. Again, I don't mean this to imply intent or any ill intent, but I think we have to understand just human nature in these very
complicated processes.

But I think that the productivity goal would be one that is creating a very strong conflict with respect to achieving the target levels and achieving our resuspension goals, and I think of the three, it would be one that I would sacrifice earlier.

That said, it comes with -- and I think maybe it's an opportunity for compromise or also for balance in terms of what we are doing. I think there are good incentives to still try and accomplish this in a 5-year time frame, and I think to do things quickly and efficiently -- and I very much like and favor the idea of targeting 100 percent but also allowing 90 percent. I think we all coming from -- those of us from an engineering field of going to 90 percent and 99 percent and 99.9 percent -- is your costs escalate just proportionally to that ability to get that small amount.

So I think there is a real opportunity for balance, but I think that that one, the productivity side, is one that I think creates a lot of the conflict that makes this -- and when we say "manageable," when I think back to the Charge Questions, can these happen individually and
simultaneously, it is the productivity goal that ultimately makes that almost impossible to achieve simultaneously.

That is -- yeah.

So I guess I'll put this out. How do we do that without eliminating that entirely? Again, I don't want to find ourselves in a position where maybe without a productivity goal, we're -- okay, redredge, redredge for the twelfth time, nope, redredge -- and there's, again, no downstream incentive either.

So it's not quite as simple as just saying we don't need that. I think we need to have some kind of control on this. I think we want to get to a clean river quickly, and I think go back to those four points, get to, you know, efficiency and removal, rapid site closure, risk reduction, and minimize impacts, unintended consequences.

**MR. FOX:** Well, I agree with you, Victor, and I think that looking at the remediation on an aerial basis and having a goal to move downstream and close things, I think that starts to tie the productivity standard in better to meeting the goals of the project.

So it's sort of what we talked about earlier today where we do a better job of defining the DoC and dredging
quickly in one, maybe two passes, and covering right away. Then I think that conflict from that standard seems to go away, because I have the biggest trouble with that standard with this unknown volume of material that we have out there because of the unknown mass.

**MR. MAGAR:** And I would agree with you 100 percent now in that this is about aerial extent. It's not about depth or volume.

I think we have got to get ourselves off of how much mass are we removing versus how much area are we able to address and remediate because that is ultimately the true value in terms of what we are doing.

**MR. FOX:** Right. But you can't get away from the volume and the mass thing because that's how people measure these projects. So that's where I like the 90 percent acceptable on a 100-percent target when we're really talking mass.

**PANEL MEMBER:** Now we dropped off 100 percent, but that's okay.

[Laughter.]

**MR. FUGLEVAND:** Rick, what experience was there on Lower Fox on the schedule issue, this 5-year versus -- did
you guys wrestle with it and any kind of experience to bring
to bear here?

    MR. FOX: Well, the ROD also had a target, and I
think the contracts were bid out that way. So we didn't
really have a conflict per se, but we also don't have rigid
Engineering Performance Standards. We have a decision tree
on what you might call a "residual standard," and then we
used results from a couple demonstration projects to very
much simplify our release or resuspension standard, which is
just based on TSS, which as the year goes -- productivity
goes up on the river, it kind of falls apart a little bit,
but we also are using hydraulic dredging.

    MR. THOMPSON: As I recall, the ROD is 10 years.

    MR. FOX: Yep.

    PANEL MEMBER: For Fox.

    MR. FUGLEVAND: Ten years at Fox?

    PANEL MEMBER: Yeah.

    MR. MAGAR: Do you guys know, does this ROD
specify a volume or require a volume, or is it an area? It
doesn't specify just how areas are identified? I admit I
don't understand the ROD well enough, but that it's based on
concentration targets?
MR. FUGLEVAND: There was an estimated volume in the ROD of 2.65 million, something like that, but I don't know if it's -- I don't remember how it's mentioned.

MS. HOLLAND: Victor, are you asking that question of EPA or --

MR. MAGAR: No, it's more rhetorical. I think that it would be worth -- I guess I am thinking aloud. It would be worth our going back to that and trying to understand. I'd like to understand that.

PANEL MEMBER: Not to do the same thing.

MR. BRIDGES: Well, they said yesterday, at least I understood that that was the conclusion, that the deviation from the 5-year project life would not require a ROD amendment. Right?

PANEL MEMBER: Right.

PANEL MEMBER: So --

PANEL MEMBER: Yep, that's right.

MR. BRIDGES: And the performance standard for productivity that EPA has offered indicates that they would deviate from the length of the project at their discretion. So that more than implies the statement that they have the flexibility to do something different in that regard, but it
does -- you know, the whole -- the dominant -- it does -- you know, the dominant design principle, if you will, for the project has been productivity. I mean clearly.

At our introductory meeting, I think there was a significant amount of discussion about why they didn't meet or weren't able to meet these production goals and we got to get more scows and we have to do this and we have to do that, and the issue is, well, if you've got more scows, then you've got more -- you're moving more stuff in the river.

You're kicking more stuff up into the river. You know, you got more scows, you got more tugs. So there are those issues.

It seems to me that the productivity just I think -- I see a lot of value in what Victor was suggesting, that this -- and I don't think it's that we're making -- treating lightly the idea of inconvenience to the community or these other kind of impacts, but there is a reality for these kinds of projects, especially one -- the word "unprecedented" is overused right now in the common vernacular, but I think it's fair to ascribe that specific term to this project.

To me, I think the sticking to this or holding
onto this 5-year idea and the production goals that are
associated with that is unnecessarily inconvenient and
complicating for the other goals, which I think the other
goals or the other standards of residual and -- as I would
define "residual," which includes in the prism and outside
-- as well as resuspension and release, those are the EPS
that truly impact long-term recovery. I mean, those are the
ones.

Now, if we were in a situation where -- I don't
think we are talking about a project taking 10 years or 15
years as opposed to 5. I don't think anybody is suggesting
anything even remotely like that, but I see a lot of value
at this point in my thinking of focusing on two, if you want
to call them "standards," Engineering Performance Standards
being reformulated, residual standard, and a reformulated
resuspension standard and not, you know, inviting all the
complexity, and I think the unintended consequences in real
terms for the environment that this production standard
brings with it.

MR. MAGAR: Sorry. I'm going to wrap around and
maybe say something a little different than what I was just
saying.
That is where we need to think of where there is some balance in a decision like this because, in fact, we might be going to 10 years or 15 years. If we are really at half the production value or half the production rate that Paul calculated than what was expected -- we are at 250, not 500 --

**MR. BRIDGES:** You mean in terms of what they were able to achieve in Phase 1?

**MR. MAGAR:** What they were able to achieve and what seems to be kind of what we are able to achieve down the road. I think you were saying something on the order of 250 or a thousand yards.

**MR. FUGLEVAND:** From kind of a dredge production, Greg and I both did it a different way, and we both came to about 350.

**PANEL MEMBER:** 350.

**MR. FUGLEVAND:** 350 to 400, kind of, just being on the -- kind of from the dredging perspective but not wrestling with the issues of lockage and some of the other things that we didn't crank in.

**PANEL MEMBER:** Right.

**MR. HARTMAN:** Yeah. We didn't use time, like the
lost time due to the offloading, which is a big factor.

PANEL MEMBER: Yeah.

MR. HARTMAN: We did not look at or include the lost time due to barge offloading, which is a big factor in production.

MR. FUGLEVAND: Yeah. We assumed it had been resolved --

MR. HARTMAN: Yeah.

MR. FUGLEVAND: -- so we could get a -- but, yeah,

350 is not 550.

MR. MAGAR: Right. And so now if it were -- yeah. You could add -- that could be quite a lot, and if it's less, if it's closer to 250, now you've doubled the amount of time. And if the volumes are increasing -- I mean, that's why I think, you know, I have -- I have no heartburn about removing less volume if we're capturing the same amount of area. I think there is no net consequence to the environment. It might actually be a net benefit in terms of just removing mass that may not be necessary. So, to me, this is not about mass.

I am concerned that this does -- that if we're not careful that this goes out to 10 years or 15 years, and
that's not something that I think we or the community or anybody wants.

MR. BRIDGES: Well, as you say, there are natural -- I mean, there are incentives without even having a standard which would drive --

PANEL MEMBER: Yes, I agree.

MR. BRIDGES: I mean, everybody -- you know, without having a standard, everybody has an interest in having this done sooner rather than later, but the issue, EPS are intended to provide constraints --

PANEL MEMBER: Right.

MR. BRIDGES: -- constraints on a project, and that is what the residual and the resuspension standards represent.

Whereas, the production standard is the opposite of a constraint. Therein lies the tension, right?

So, if you acknowledge that there is always going to be just in natural terms or, you know, an incentive to have a faster project than a slower project and just focus in on the constraints, what you -- you don't want to make a mess, right, or you want to limit the mess based upon your best understanding of the processes operating. You don't
want the mess to exceed a certain level in the project because that will constrain your recovery time.

**MR. FUGLEVAND:** Yeah. There's nothing that I've seen in either the presentations or the documents that lays out a case for protection of human health and the environment, you know, the primary criteria tied to 5 years.

It just seems to be -- it almost seems like something that was assumed at the time of the FS as a basis to do an FS, and then it's just been carried through. I don't have a sense that it is a primary factor as far as meeting the primary objectives of human health and the environment.

If it went 15 years, it might be different, but it seems more to be a planning number rather than a circle or criteria number.

**MR. BRIDGES:** There would have to be a lot more information on the table in terms of the quantitative consequences of deviation from this 5-year thing.

I mean, there are realities about consequences in terms of residuals and resuspension. I can get my mind around that, but I think the consequences, if you will, of deviation from -- you know, if you go 1 month over the 5-year standard or that 5-year goal or you go 6 months, I
mean, what is that?

    MR. MAGAR: I mean, it's interesting that what I'm perceiving, that EPA does not mind this change, but that begs the question why this was put in place in the first place. I think there is a good question. Why did we create a 5-year constraint or production standard, if not for --

    MR. BRIDGES: Well, I mean, I think -- well, you know, having such a thing implies we're serious about this. This is a matter of some urgency, and we're going to tend to -- I mean, I'm not -- I mean, I can see there would be a whole host of reasons why -- maybe I shouldn't even have said that.

    MR. MAGAR: Mine was as much a rhetorical questions.

    MR. BRIDGES: Yeah, I'm rhetorical too. I'm being rhetorical as well.

    [Laughter.]

    MR. MAGAR: But that's my point. I mean, I think there is this fundamental -- well, "conflict" was the word that was used, but you got two standards that are clearly constraints on operations and a third one which is a goal which pushes in the other direction.
Unless there is a better articulation of what the environmental consequences are for this goal, which pushes everything in the other direction, which is the kind of dominant design principle for the whole project, then I can't see the justification for it at this point.

But that's not to say that they might still be able to get there. I mean, if we can clearly articulate what we were discussing as much this morning of this more streamlined approach to residuals and such, I mean, they might even exceed their production goals. Who knows?

MR. FUGLEVAND: Especially if, again, it's kind of they're both -- you talked about incentives. If both sides are equally incentivized and they see the benefit in heading down that path -- and one of the things we talked about is greatly streamlining the dredging process, so that they're done, then there is -- you know, GE has an incentive, if nothing else, financially to do it efficiently and quickly.

PANEL MEMBER: Right.

MR. FUGLEVAND: And, again, I don't know if the 5-year provides a benefit or not. I think what we have talked about the last couple days is we've seen that overemphasis on productivity has had kind of an impact on
the other parameters to a greater degree than maybe you
would have hoped, and that in itself may be a reason for
just backing off.

    MR. BRIDGES: I think it's important how this is
communicated because, you know, nothing -- in kind of
eliminating, say, a production standard or converting it
into something other than a production standard, it's not a
-- it isn't a reflection of lack of importance or, you know
-- to continue your brain surgery analogy, do you want to
tell your brain surgeon, "Well, I want to know this is very
important to you, so I want you done in 8 minutes"?

    MR. FUGLEVAND: Yeah.

    MR. BRIDGES: I don't think so, right? Take as
much time as you want, right? I only have three of those
cells up there, and I need all the attention that they can
get.

    MR. FUGLEVAND: Yeah, that's right.

    MR. BRIDGES: Right? So, I mean, you wouldn't
approach that problem like -- that's not a fair statement,
just because the guy is not rushing through, that he is not
taking the job seriously.

    MR. HARTMAN: You know, the project, one thing --
we're kind of skipping around, but we figured they can reach 400,000, close to 400,000 cubic yards a year, even though this is their first year, and they were trying a lot of new -- or maybe kind of monkeying with the operation, trying to figure out the best way to do it.

But if the numbers had have stayed a 1.6 million cubic yards for the last 5 years to be dredged, they could have met it.

And the issue here is -- the issue is the number of years because now we're talking 2.4 million or a significantly greater amount of material to be removed.

So are we talking about the wrong thing here, the productivity? But the productivity is somewhere around 400,000 cubic yards a year, but the volume is 2.4 million cubic yards.

MR. FUGLEVAND: Yeah. I think the original, the ROD was 2.65 but said it would be revised based on the design. The design moved it down to 1-point whatever the number was, and then during implementation uncertainty, the number went back up. So we have been kind of bouncing in the noise range, I think, of the number.

If you go to dredge at all, if you take the
110-percent approach to dredge, you won't know the volume
until you are done in the last year. That's just the
nature, unless you go out and do very -- even if you go out
and do a characterization that is careful, there's still the
variation between data points, and you won't have a certain
number until you are done.

But you're right. From a productivity standard,
the fact that the volume changed but we don't allow any
change in the amount of time to do it, again, seems almost
backwards.

MR. BRIDGES: Right. I mean, one thing -- well,
just because it struck me. Rather than talking about a
production standard, why don't we talk about a production
capacity? Right?

So what is the capacity that is desired, because,
for example, if -- they could become -- you guys could
probably perform some calculations in this more streamlined
mode that we're talking about. Maybe they could even get
done faster than 5 years, but they may not have the
production capacity to do something short of 5 years.

I'm not sure I would necessarily be bothered by
that. I don't know how much would be gained by being able
to finish in 4 as opposed to 5, but I think that thinking
about a production capacity as opposed to a standard would
remove this daunting tension that exists between the
production and these other standards.

MR. THOMPSON: But I would have to point out or
I'd like to point out that if they were even able to get at
400,000 cubic yards, they would be above the rate they
worked at this year, and they still had the resuspension
problem.

So we haven't really done anything, if you will, per se, to aid the resuspension or, for that matter, the
residual standard. So it would fall back to the need to
reduce the number of buckets and the number of open CUs, so
that we can -- it's really tied more to that than it is
really relaxing the production standard. If we were going
to argue, well, maybe we should only dredge 200,000 cubic
yards per year, well, now you're talking 10 to 14 years of
dredging. I don't think that's what anybody is recommending
here.

So it almost would seem that unless something
changes on the capacity side, they wouldn't make 5 years
anyway, based on the analysis with you guys.
MR. FUGLEVAND: And I think, Tim, on that whole topic of 200,000, we had a conversation earlier that if we had -- if the standard were written such that the contractor had to follow an explicit protocol from up river, down river, and not be able to jump around, we hear GE and Andrew describe many situations where they had to adapt on the fly to keep the dredges working.

MR. THOMPSON: Yep.

MR. FUGLEVAND: So sometimes they were dredging, had to move downstream or to different CUs --

MR. THOMPSON: Yep.

MR. FUGLEVAND: -- and that type of thing.

And I, for one -- I've lived that. I've lived the -- you know, the 7-month death march where you're trying to get something done, and you do encounter situations all the time. And I think it's very unrealistic to discount those complications.

I think what I've heard EPA discount, I think has been unrealistic. I think one example is not having full barges.

I've dealt with those same scows, and as soon as you put water in them, you create a huge, long channel that
you get a slosh effect in. The Coast Guard has explicit requirements. You can't -- you're not even supposed to go over half full because you can get setting-up in them, and so you have to not overfill them. So, if you put water in the barge, you have automatically, dramatically reduced their haul capacity, especially since they're long, deep barges.

We had a project where we put baffles in to basically deal with that, but that's something you have to plan ahead for.

So, to simply sit there and, as I heard, kind of throw stones about not filling them full, I've been there, and it is very difficult, and there is all these constraints. It wasn't in GE's advantage to not fill them, but, you know, if you're a tug operator, you can't grab onto that barge if it's got too much water in it because you can sink it.

So I think the productivity standard has almost become like a whip that I don't think is necessary. It's an extremely difficult project. I think you guys all know that, and it's extremely a huge amount of constraints that the first time through were very difficult for anybody to
implement.

I wouldn't try to push productivity up a lot, other than getting started earlier, just so you have time to deal with those challenges and not rush because, when you rush, stuff happens.

MR. BRIDGES: Right. That's along the lines of your last point there. In Phase 1, Part B, which is the part of Phase 1 that didn't get completed in Phase 1, which I assume is the next cycle, right, which would be considered part of Phase 2, but, nevertheless, it was originally designed as Phase 1, I think that -- just to emphasize a point relative to Charge Question 4, that needs -- you know, I really would want to see us make some recommendations about how to monitor and collect information, maybe even using multiple operational methods, right? Let's try A, B, and C approaches and test some alternatives that we could then field later on as opposed to saying, "Well, we're just going to try it this way, and then, you know, if it works, we'll proceed; if it doesn't, then we'll figure it out," but to actually try some different operational practices and then collect the data necessary to determine which one seems to merit continuing into the real Phase 2.
MR. FUGLEVAND: Yeah. We talked about the whole idea of need for a lot more near-field data on what's going on, not just TSS but PCBs. Again, I could see some near-field data that look at, in some cases, different dredging practices, and depending on how you advance the dredge, does that cause a dramatic increase in resuspension or not? If it doesn't, then you kind of use that to adaptively manage to be even more flexible. If it does, you ratchet down.

We talked about the sand, placing the sand. If you place sand 2 weeks after you've opened an area and you kind of monitor near-field in that time, we could see the benefit of it and have a basis to --

MR. BRIDGES: Well, the fact is there are a lot of monitoring technologies available now that haven't been used at some sites around the country that aren't in this plan, and passive -- I mean, they could be used to look at, because a lot of these issues may have to do with flux and how much are you getting out of --

So I think -- though I am not prepared to recommend a specific series, I am just saying in the last 10 years, there's been a large advancement in sampling and
monitoring PCBs in dynamic environments, and there may be
some potentials there that should be considered.

**MR. SCHROEDER:** Well, Todd, do you think it's
important to try to differentiate in the near-field,
dissolve in particulate, and that there should be that
attempt to do this in a manner where taking a whole sample
and compositing over some period of time still allows for
partitioning between the two phases, while we go to some of
the newer methods, which are just designed to take dissolve
clearly differentiate that?

**MR. BRIDGES:** I mean, those are some of the things
-- not to get back, Tim, to the modeling thing, the modeling
question, but I think there -- in the time that we have
remaining maybe in our process here, we can make some
specific recommendations that long, but I doubt we'll have
the definitive end note on this that -- yeah, I mean, that
level of specificity, these kind of processes have to be
teased apart.

I mean, in some of my notes I prepared from our
last get-together, I was trying to break out those processes
that needed to be understood and tracked, and I am quite
confident the modeling has those processes represented at
some point, but you've got to have some data from the field
to be able to base those on at some point.

MR. THOMPSON: Just so it's clear in my head, are
you thinking, for example, passive samplers?

MR. BRIDGES: Well, that was one. That's where
he's going. That's where he's going.

MR. THOMPSON: Surrogates for fish like Upal Ghosh
is doing in Maryland.

MR. BRIDGES: No. But just to look at dissolved
fraction.

MR. THOMPSON: Right.

MR. BRIDGES: Because you have to be able to -- I
mean, clearly -- I think both EPA and GE indicate -- well,
the presumption was in the beginning PCBs would go where the
solids were.

MR. THOMPSON: Right.

MR. BRIDGES: There seems to be, hmm, maybe that's
not working out that way.

MR. THOMPSON: That's an interesting thought.

MR. BRIDGES: And oil certainly would be a
different phase.

MR. THOMPSON: Yeah.
MR. BRIDGES: And I know that's kind of an open --
still kind of an open question as to how much could have
been contributed from that.

I don't want to necessarily take us down the
monitoring route. So there is an opportunity. I don't know
what they're calling it -- you know, this Phase 1B. You
know, is it Phase 2, or is it Phase 1B, you know, and is it
supposed to be -- you know, I don't know. There just seems
to be an opportunity there to continue to learn.

And I'm not saying that even in year three of the
project, your opportunities to learn haven't ended, because
I'm convinced that there are going to be things that are
going to come up in every year of this project that were
unanticipated and that they're going to have to deal with.

I mean, has there been a dredging project in the
history of, you know, the last 50 years where that's not
been the case? I don't think so.

MR. FUGLEVAND: You know, you kind of bring up
monitoring. Maybe it would be good we chat a little bit
because that's the fourth question, and we have spent a lot
of time on the other ones, but I think some of the ideas on
monitoring, it might be good just to throw some things out,
experiences on other projects, types of things to deal with
the models or to the near-field events, and, you know, the
question of, again, what's the balance between and update
and just getting the job done.

What are you doing on the Fox, Fox?

PANEL MEMBER: "Fux," that is.


MR. FOX: Well, we have a decision tree. One of
the things we do for our residuals is we do compositing. We
take samples and composite layers, 6-inch layers in order to
try to make decisions on a more surface-area basis rather
than individual sample node. That's one idea that I'd like
to advance.

MR. MAGAR: That would be a nice volume reduction.

Yeah.

MR. FOX: Yeah.

So, I mean, sheer numbers of samples. I just feel
it's better information to look at it that way. It can be
problematic when we're chasing individual samples.

One of the examples we had in OU1 of the Fox River
is we had a single sample that came out 30 parts per million
after dredging, and then we redredge, and it was 27. Then
we redredge, and it was 18. So we definitely hit the point of no return on that.

MR. FUGLEVAND: So, like on the Fox, you take 6-inch samples from multiple locations?

MR. FOX: We take 2-foot cores, and then we composite within a certification unit at a much lower density. We are looking at 5 cores per maybe an acre area and taking the average of that.

MR. FUGLEVAND: Yeah.

MR. THOMPSON: It almost seems to run counter to what we've at least thus far talked, and that was having a defined dredge cut and then closing afterwards. Why would you want to take another sample?

MR. FOX: Yeah. That's what we were doing here, yeah.

PANEL MEMBER: Yeah.

MR. FOX: Certainly, if we get into the testing, regardless of whether -- in fact, if we are going to put the cover down, the backfill, then I would advocate compositing samples, so we don't get fixed on an individual sample.

MR. THOMPSON: I would almost wonder whether you'd want to look at an individual sample to determine what type
of cap you need to put down.

   **MR. FOX:** I would argue that a cap or a backfill should be based on an average of whatever you --

   **MR. BRIDGES:** Yeah. You'd have to settle on that design, what that spatial average should be. You're not going to put -- you know, we're going to design one type of cap for this 3 square feet and we're going to design another cap for that 3 square feet.

   **MR. THOMPSON:** I guess my thought would be, just to be protective, I would want my fill to be protective of the highest concentration that would be within that area.

   So, if I've got a Tri+ of 1 and I've got a Tri+ of still -- I'm still hitting 27, 28, 30, I don't think just putting a simple cover over it is sufficient.

   **MR. MAGAR:** Unless you think that -- unless you consider that fish are exposed to an area. I mean, that's the whole basis of SWAC. So we are not designing to an individual point. We are designing to an exposure.

   So I'd have to disagree. I think you can -- that was even the basis of these performance standards, that there was an allowance that you could actually hit 15 ppm and still have an average less than 1 because what does it
mean to -- I think this was credit to EPA of thinking that we're saying it's 1, but 1 is -- you know, is not just a finite number. It's not a "not to exceed" number, but it was a target.

So, I mean, I think that looking at it from a SWAC perspective allows a lot more flexibility.

MR. FOX: Especially since the PCBs are hard to -- it's not -- you know, one of the analogies that I think about is, you know, it's not like we have a chimney venting out from a single sample. It is more related to what is that average concentration.

MR. THOMPSON: But the cap is as much about containment during flood events as it is just simple containment. If it was just simple containment, then you're right. Backfill could be used everywhere. I just think of it as a source.

I'm probably in only .2-percent agreement with you two guys.

MR. BRIDGES: Well, there's a lot of room to -- in my esteemed opinion, there's a lot of room for improvement in the principles that engineers use to design caps.

PANEL MEMBER: Yeah.
MR. BRIDGES: Historically, I think there's been a considerable amount of over-design, a considerable amount. Now, I wouldn't say that that's necessarily true in all cases, but I think that's something -- you raise a good point, though, Rick. I would say that it's something that needs to be looked at, and we did ask for that last time. And I confess to not having looked at it in great detail, but what were the design -- what are the design principles and elements, assumptions, modeling and whatnot that are going into these caps, and are they consistent with the Phase 2 that's envisioned?

And this kind of practice that we've been talking about, where we've been talking about, well, just put your backfill in and then mod as necessary, depending upon what the sampling tells you, to make it a cap, you know, is that -- can that kind of operation be merged with good cap design, or how should it be merged with good cap design?

MR. FOX: Well, you know, another point is a lot of this area, we're going to change the hydrodynamics in the depositional characteristics of the river quite a bit after we're done dredging, but the fact of the matter is the top of the backfill or cap in many cases is going to be below
the original grade, and I think there's some expectation that in some of those depositional areas, there will either be more deposition on top of that, thereby stabilizing it even more.

But you do have a good point, Tim, because if an episodic event erodes a backfill or a cap in that interim before it would get buried deep enough, then it could be an ongoing source.

MR. MAGAR: Complementing what you said about the subject yesterday, I think if we are going to have a different standard for how we're removing and leaving more material in place, I think we have to have a more rigorous standard on the cap.

PANEL MEMBER: Yeah, I agree.

PANEL MEMBER: And I don't know where that will go, but I think that's what I'd agree to.

MR. FUGLEVAND: I've got a question on monitoring. One of the things we heard when Andrew was talking about productivity was there were some situations where the lab was backed up several days.

PANEL MEMBER: Yeah.

MR. FUGLEVAND: And they couldn't get the data out
of the lab fast enough to make decisions.

    PANEL MEMBER: I'm shocked.

    MR. FUGLEVAND: And is that a factor of doing Tri+, or we're hearing about this Wisconsin correction -- or is that an issue? Does it take more time to do the Tri+ analysis and get results back? Is it a more complex analysis?

    MR. FOX: Well, the modified Wisconsin method has more to do with air-drying the samples. Is that what you guys are doing?

    No. Okay. So it's analytical.

    MR. BRIDGES: Well, I mean, the fact is that when you are processing this many samples, stuff is going to happen at the lab.

    PANEL MEMBER: Labs lie.

    MR. BRIDGES: Huh?

    PANEL MEMBER: They lie.

    MR. BRIDGES: Well, I mean, you know, it's an assembly line with a lot of complicated instrumentation and everything else.

    MR. THOMPSON: Just quickly clarifying, you guys analyzed on a conjugate basis -- or a homolog?
GE PRESENTER:  [Speaking off mic.]

PANEL MEMBER:  Air cores and sediments.  Okay.


On a sediment residuals issue, really it was a sample throughput.  We had planned in the laboratory to be able to handle a CU in a day, basically 24 hours we turn around 40 PCB air core analysis.

MR. FOX:  So, just to clarify, you're talking about processing in order to get it ready to send to the lab?

MR. GIBSON:  From the time the samples left our processing facility, we had segmented the cores, put them into jars.  The lab results came back in 24 hours.

PANEL MEMBER:  Okay.

MR. GIBSON:  We had planned for being able do 40 in a 24-hour period plus 50 percent.  When we started analyzing all those lower segments, instead of 40 a day, we were generating 160 a day per CU.

PANEL MEMBER:  Wow!

MR. GIBSON:  So you can see the logistics backed up quite a bit.
PANEL MEMBER: Another argument for composite.

MR. FUGLEVAND: Yeah, it is.

MR. BRIDGES: Right. But that wouldn't -- you know, in the scheme that we were going toward where you just backfill -- I mean, you relieve the tension on -- I mean, it doesn't affect your in-water operations if you have a slight, you know, issue with the production rate of sampling -- or producing your analytical chemical results.

MR. FOX: As long as you can stay somewhat caught up, though.

MR. BRIDGES: Well, yeah. I mean, yeah, obviously. You don't want one of those "I Love Lucy" moments with the chocolate coming down. You know that episode? That was a funny episode.

MR. MAGAR: I'm going to comment on your -- just the dissolve phase idea.

I don't know where to stand on that just yet.

MR. BRIDGES: On what?

MR. MAGAR: On measuring dissolve phase using "speemies" or SPMDs or something like that.

MR. BRIDGES: Well, I don't have a firm opinion. I'm just saying there are a variety of techniques available.
MR. MAGAR: I think there's got to be some caution to make this an experiment rather than -- and it's a DQO question, and it's getting to what -- you know, it could be really interesting stuff, and it might even explain --

MR. BRIDGES: Just because I do research for a living, I don't want you disparaging my recommendations by attaching them to that word because this is a very important point.

MR. MAGAR: I wanted to relate to something that is going to actually be an operational decision in the field.

MR. BRIDGES: Yeah, that's right. I agree 100 percent with you. I'll say amen because I think the danger, if -- well, when we articulate this, you need more monitoring data to sort out these kinds of things than somebody who just wants to make a point, will say, "Well, studying this thing to death, it just creates more delay," blah, blah, blah. That's not the point. It's not a research exercise or anything. There are serious gaps in what's going on in the river when they put dredges in this river and what they're doing, and they need to learn, so that they can adapt their operations accordingly. It
doesn't have anything to do with that.

So I don't view it as an experiment. I wouldn't view it as research. I wouldn't use any of those terms. I agree with you entirely. This is operational.

And that's my point about the modeling is to help, you know, that that could be used to help be very specific about those DQOs and establish what those needs are to inform that operational practice.

PANEL MEMBER: Right.

MR. BRIDGES: You were just trying to provoke me, I know.

PANEL MEMBER: You outed me, so I thought I'd out you here.

[Laughter.]

PANEL MEMBER: Is there more on monitoring?

MR. FUGLEVAND: Go ahead.

MR. MAGAR: I think, going to the graph that John had put up about the solids, if there was one message I got was that solids, the TSS at least is dropping out very clear, close to the dredge, and it puts into a lot of question of value for resuspension controls, which, in my experience, what I understand from the field, there's a lot
of question into the value of silt curtains. Besides that it slows down production, it makes things a lot more difficult.

I have an experience in one river where sheet piling was put in, and that caused increased velocity in the second half of the river where there wasn't sheet piling, and a scour hole of about 17 feet was created. That's pretty substantial. That's a lot of material being scoured.

So I think, as EPA stated, it's their own data. I think they should look at this very carefully about whether they would promote the kind of resuspension controls, and I think we should look at that, if it's done at all, very cautiously.

I would recommend it's not. I think if you look at it from the value that you're gaining versus the hindrances and the problems you're creating, I don't see the net value.

**MR. BRIDGES:** Of sheet pile.

**PANEL MEMBER:** Of sheet piling or of --

**PANEL MEMBER:** Or that hard structure.

**MR. MAGAR:** -- silt fences. That maybe if they're only anchored down to the bottom, that would make things a
lot better.

**MR. BRIDGES:** Well, I mean, silt, to make the
point about that, silt curtains -- well, it's even
debatable. To some degree, maybe control particulates.

The traditional silt curtain doesn't do a thing
about dissolve phase.

**MR. MAGAR:** I agree. I just wanted to have my
voice -- I wanted to put that on the record because I'm not
quite sure where both sides stand, but I have heard some
recommendations that it would have worked a lot better if
they were just anchored better. I don't really see that
that bears out from the evidence of this site or other sites
at least.

**MR. BRIDGES:** Well, I assume that picture up there
is for a purpose.

[Laughter.]

**MR. SCHROEDER:** Well, I'd say where monitoring of
dissolved concentrations versus total, you know, of course,
lead to better conclusions as to whether or not you would be
distributing PCBs.

I mean, if it's predominantly being transported in
dissolve phase, then certainly silt curtains will do nothing
for you.

I, of course, you know, probably agree that silt curtains do little beneficial things as a rule. I mean, it decreases surface TSS concentrations as a rule, so it does.

MR. MAGAR: And if it's in the solid phase, this data says it's mostly dropping out within 200 feet.

PANEL MEMBER: Well, yeah.

PANEL MEMBER: Not that this is necessarily definitive, but --

MR. SCHROEDER: No. But what you've done now is you've changed the area over which you have diffusion of these higher concentrations going into the water column. So, if you kept it within the curtain and none of the solids went elsewhere, then the loss through the water column becomes different or rate of loss to the water column becomes different than overspreading it.

MR. BRIDGES: I don't know. I'd ask Paul Schroeder to comment on that because you guys reviewed extensively the silt curtain literature and recommendations in putting together the environmental dredging guidance. I think it's a fair characterization that there is just not a silver bullet to this problem. I mean, there just aren't.
Especially, I mean, maybe if you have still water, you know, maybe you have the best conditions, but that's not what they have here. The flow varies on 20-minute time scales or something which I heard? You know, come on.

**MR. SCHROEDER:** Certainly, where you have fluctuating water levels and high velocities, they are not a good idea. They don't do much for you.

That's where you get to the silt curtains with carbon as an alternative, which would be, again, trying to control dissolve. I mean, you might see an effect, but, again, we are not looking at those, and we have no case studies of those.

**PANEL MEMBER:** Right.

**MR. SCHROEDER:** On the other hand, I think the data that they show themselves here, that they didn't show any data in Phase 1 from silt curtains' effects, but, of course, the sheet pile effects was that they did reduce losses.

So, if you can't actually control the solids and they're spread, you can control losses.

**MR. FUGLEVAND:** And, again, when you control -- controlling the losses comes at both a schedule impact and a
production impact.

**PANEL MEMBER:** Absolutely.

**MR. FUGLEVAND:** So everything is trading off.

**MR. BRIDGES:** What about -- I'm going to ask the dredging engineering members of the panel. This -- well, first, I mean, there was public comment raised yesterday about hydraulic dredging. I mean, it seems rather challenging to switch those kinds of -- I mean, you're like going from an Arabian to a donkey or something. It's a big change in horses right in the middle of the project.

[Laughter.]

**MR. BRIDGES:** I'm not saying that hydraulic dredging is somehow inferior, genetically or otherwise, but it's a big change in approach at this stage that seems to me impractical, but I'll let you guys comment on that.

The other thing is going to a different size clamshell. I guess one of the questions I have, okay, we're going to go to bigger bucket or even bigger than 5 cubic yards or whatever, is this issue about spillage and such. I mean, if you've got a lot of water, you know, I wonder about that. Is that going to be just -- is that a relatively straightforward fix to reducing the number of bites, just go
to a bigger bucket?

**MR. FUGLEVAND:** Well, going to a bigger bucket starts to require a much bigger machine. I mean, you get over 5 cubic yards, the weight of the steel on the end, and then the mass you put in the bucket, it just takes a bigger excavator, and so you're getting into bigger draft. And we're in a shallow river. So going to a 5-cubic-yard bucket just seemed like it was not an unreasonable -- we're not swinging it from a Derrick rig and you can hang more on an excavator. So they're a fairly good-size excavator, the 385, and they're probably starting to get limited on the size of bucket they could put on the 385. So, if you wanted to swing a bigger bucket, you'd have to bring in bigger excavators, and then you tow down a lot more.

But the topic of using -- I think the general experience is the bigger the bucket you can swing, you get much more efficient dredging. And they showed a graph yesterday of a 1-cubic-yard bucket that was 75-percent full was much less productive than 5-cubic-yard bucket half full, just because you're moving so much more per bucket and a bigger footprint.

But I don't know if the issue would have to look
into how much bigger of a bucket can you go. I wouldn't be surprised they're close to being limited right now in the 385s.

MR. BRIDGES: Well, Paul --

MR. FUGLEVAND: Is that the case, Andrew?

MR. INGLIS: Yeah. This is Andrew Inglis.

A 5-cubic-yard bucket, I think is as large as we've been prepared to go at this point.

MR. SCHROEDER: Paul, my question regarding that would be can you design -- could they put a different bucket design on it which would have a deeper cut in a smaller footprint? It will still be the same volume, and so, therefore, maybe you reduce the number of vertical bites.

MR. FUGLEVAND: I think, again, it's cubic yards per bite.

I think another bucket that we've used is like the Young rehandling bucket that they used to offload with, and that bucket is a -- it's not a level-cut bucket, but the two halves of the bucket pivot on an offset, so that the center two-thirds of the cut is pretty level. It's within probably 6 inches of level, but it's not going to plow. The level-cut buckets plow, and as they plow, they stir up, and
they kind of scrape across the surface, and they do a lot of disturbance.

But like the Young bucket kind of slices underneath, and so, from a removing mass perspective, I mean, a lot of material, the Young bucket is -- provides an advantage if it's not doing as much remolding and disturbance but removing the same quantity. It has a smaller footprint. It does dig a little bit deeper on its cut, but those are nuances that are really difficult to get into at this level.

But it depends on the project. You could tweak that. It --

MR. BRIDGES: That's an example of the kind of thing where the next iteration, they could evaluate it.

MR. FUGLEVAND: Yeah.

MR. MAGAR: Part of that comes back, will circle back to the beginning of our conversation of incentives. GE has every incentive to do this as cost effectively and efficiently as possible, and they can and I'm sure that they will. And I believe that they did in Phase 1 as best -- you know, granted, with the understanding that there was a very significant learning curve in trying
to figure out what that was. So there were some inefficiencies that they probably figured out. As they had said to it, it's really nice to look in hindsight, what they had then seen, maybe that 1-cubic-yard bucket didn't make sense, you know, and they could have gone to 5.

So I am actually reassured. I like that Paul said going above 5 may not make sense because I wondered the same, why not go to something much, much larger, and I don't understand as well the practical limitations of that.

MR. BRIDGES: Well, I'm just saying this kind of recommendation in terms of how the operation and the equipment that could be evaluated in Phase 1B, right?

PANEL MEMBER: Mm-hmm.

MR. BRIDGES: And association with even monitoring, is that the case that maybe with this Young bucket that you would get less residual or you'd get less resuspension than you would with the more level-cut buckets? You could evaluate it.

MR. FUGLEVAND: Yeah, you could, and, again, I think it's almost in a triage approach, that if you found that it was critically important, that it was the bleeding artery, then it might make sense to chase it.
Whereas, if -- again, it's how significant is the magnitude. If you found out by some fairly simple mods to current practices, you know, the residuals are kicking up, aren't taking you off the scale for the rest of the project, you may not need to go there.

PANEL MEMBER: Well, yeah, I understand that.

MR. FUGLEVAND: But there could be some things that GE is just going to do on a kind of project basis that, you know, it could try, but I think the issue of -- you know, like this whole industry, we're still real steep and early on the learning curve. We're still -- everything is -- we're still trying and --

MR. BRIDGES: Well, on this point, we spent a lot of time talking about the operation. I mean, there is not an operational standard, per se.

MR. FUGLEVAND: No.

MR. BRIDGES: If you think about the Charge Questions, the Charge Questions, we're asked to comment on the EPS. But we're spending a lot of time talking about operational practices and how they influence the EPS.

PANEL MEMBER: Yes, but --

MR. BRIDGES: I'm assuming that's not outside of
the charge or the scope.

Well, no, I don't think it is, but I've been sensitized to that. You know, what can I say.

I guess this would be related to productivity.

**MR. SCHROEDER:** Well, this is a question of getting a practice-able resuspension standard, you know, that what is practice-able is based on --

**MR. BRIDGES:** Are you trying to say "practicable"?

**MR. SCHROEDER:** Practice-able.

**MR. BRIDGES:** Is that what you're saying? Okay. I just want to make sure I understand what you're saying.

[Laughter.]

**MR. SCHROEDER:** Practicable, whatever word you like.

**PANEL MEMBER:** Okay.

**PANEL MEMBER:** Either or either.

**PANEL MEMBER:** Anyway --

**PANEL MEMBER:** Participatory engineering or something there for a minute.

[Laughter.]

**MR. SCHROEDER:** Participatory, yes. Okay. But, anyway, again, the issue is that we're going
to give them a target that they should be shooting for that we think can be done, and the method and operations go hand in hand with that. And if we don't think their operation was best management practice, then we can certainly recommend something that was lower than what they actually achieved in Phase 1. I think that's what our goal and charge is.

PANEL MEMBER: All right, I understand. The Consent Decree says that, you know, at a minimum, we are to comment on these, on these questions.

MR. THOMPSON: I was going to make two comments. I, for one, would not presume at all that they didn't do best management practices. All I think we can comment on is whether we are aware of some other things that may be helpful to them in the future.

PANEL MEMBER: I agree.

PANEL MEMBER: I think we all agree with that.

MR. THOMPSON: Yeah. I just was commenting on Paul's issue. And, gosh, I keep bringing this issue up. I want to roll back to monitoring recommendations. The 2003 peer review had strongly recommended permanent near-field
monitoring stations for PCBs, which were not accepted, and
we're in the role of not having that data yet. So I just
want to put that one on the record -- is that we would have
had the data had the peer review been listened to.

MR. MAGAR: Did I hear "I told you so" or is that
--

[Laughter.]

MR. THOMPSON: This is more "please listen," if
you will.

MR. MAGAR: I'd like to ask. Can I just follow-up
on Todd's question about the hydraulic dredging? Because
that has come up, and it's not something that -- it seems
like there are pretty vast distances. It seems like there
is quite a bit of debris. Is that a practical
recommendation?

PANEL MEMBER: Participle?

PANEL MEMBER: Yeah, yeah.

PANEL MEMBER: Participle.

MR. HARTMAN: Debris is a killer for pipeline
dredge. Debris like that makes it very inefficient to
remove the material. Obviously, you are just continually
cleaning out your cutter head and suction pipe.
I believe, strongly believe, the equipment that's been identified or the type of equipment that's been identified for the project, with the exception of maybe a level-cut bucket, is not necessarily the best bucket for this location. But the pipeline dredge is definitely not a preferred alternative.

**MR. FUGLEVAND:** I think if you think CU-1 was bad when you did it the first time, if you would have tried that with a pipeline dredge, you would have been looking for dynamite. It would have been a nightmare.

**MR. FOX:** Can I go back to what Todd was saying about -- talking about the standards and operations? I'm sure most people know the role I play on the Fox River's oversight for the State and USEPA, and one of the big cautions that I recommend to my client is to try not to dictate means and methods and performance standards because it just really -- you know, if you set the bar and you set it carefully, then you can have some input on it, but I think you have to be careful.

Now, that being said, I think adaptive management allows for discussion of that to try to realign incentives for better performance.
You know, a lot of people think I'm an engineer, but I'm not. I like to say that I bring stress and color to engineers' lives.

[Laughter.]

**MR. BRIDGES:** Well, I think if there were a few examples in the tone of adaptive management, if there were a few examples that the panel would like to recommend be considered in Phase 1B, we could put those up there without them being, you know -- just things for them to think about.

But I appreciate your point. You kind of tie people's hands. It seems to me that's the one lesson learned in Phase 1 with regard to the productivity standards and such is that you do. You end up inadvertently tying hands and constraining things that end up causing challenges when you over-specify practice, I think.

**MR. THOMPSON:** Paul, I just have a quick process check. Are we 3:00 or 3:45?

**MR. FUGLEVAND:** 3:45.

**MR. THOMPSON:** Okay. So we've got plenty of time. Okay. I'm thinking about where to go next. Okay. Thank you.

**MR. FOX:** I think one thing that we've danced
around, haven't talked a lot about, is NAPLs.

I'm curious if people have any idea on how we can get a better handle on it. Paul "El Carbone" Schroeder here might have some ideas on how to control.

[Laughter.]

MR. SCHROEDER: Control of NAPLs? Obviously, a permeable reactive barrier, right?

[Laughter.]

MR. SCHROEDER: No. I say that in some sincerity that that is the only option that you really have is to, in essence, create a permeable reactive curtain, in essence, to force all your flow to go through or pass.

MR. MAGAR: Paul, I am going to put you on the spot. Have you seen such a curtain put in place? Have you ever tested such a curtain?

MR. SCHROEDER: No. That's why I said we have no field experience of these things.

MR. MAGAR: Yeah. Very hypothetical.

MR. SCHROEDER: I mean, they're on the market. So they're not really experimental.

MR. MAGAR: For flow?

MR. SCHROEDER: Yes.
MR. MAGAR: For horizontal flow?

MR. SCHROEDER: Yes.

MR. FUGLEVAND: In rivers?

PANEL MEMBER: Okay.

MR. SCHROEDER: Well, I mean, there --

[Laughter.]

MR. SCHROEDER: The answer there would be in woeful river circumstances, they have reasonable permeability.

   I mean, if you put a silt curtain on the upstream, try to control your flow through the area of your dredging, and put it on the down side, I suppose that, you know, you could pass a significant flow through there.

   To get through the details, I mean, they are being examined and looked at. There are some issues about clogging or plug-in and how do you implement them, such as putting a curtain in front of them to knock the solids down before you have it. So it's not used alone.

MR. FUGLEVAND: Right. My thought on the -- I was thinking about the NAPLs, and we asked about, so did you do any DRET tests, and we got DRET tests. And they were -- I don't know --
MS. HOLLAND: Paul, are you asking that as a question?

MR. FUGLEVAND: No, I'm speaking. So we got the DRET tests back and looked at them, and they were all real low. So the DRET test did not suggest the presence of NAPLs.

So it seems to me that we have seen presence of sheens. We have heard discussions that it looks like the high-dissolve phase may be related to NAPL or not. The mechanism isn't clearly understood. But I would think that part of the characterization that would happen for the depth of contamination would do a lot more of just kind of more like a DRET test and seeing is there a way that we can identify a presence of sheens or NAPLs, you know, what does it look like.

And I don't know what the partitioning required in order for NAPL to -- can you have NAPL and only have 20 parts per million? What level do you have NAPL in a sample that would spike the result, and is there a concentration at which you would expect that NAPL phase? Is there something we can do in the -- if we're going to go out and recharacterize depth of contamination, to better understand
is there a NAPL present in the sediment and to what degree, that then might give us some insight on how we might have to manage it.

**MR. SCHROEDER:** Right. You could be trying to manage certain areas only.

**MR. FUGLEVAND:** Right.

**MR. SCHROEDER:** Similarly, when we put out our oil booms, the booms now also with small skirts of absorbent materials, you know, the same permeable reactive materials are available for oil booms.

**MR. MAGAR:** I think, Paul, to what you're saying of making sure that, A, we do have some way of managing it, I think this -- you know, I think the NAPL is very challenging. I'm not sure quite how to even get our arms around it or whether, you know, if the outcome is going to be that you do not want to disturb this material, is it -- I mean, so answering some of those questions about whether or not this is a significant cause of release may be of value.

One thing I did think back to in an EPA plot that showed a lot of monos and di's in the suspended phase, suggesting that that's not coming from a NAPL phase -- because NAPL is not going to dechlorinate. It's going to be
coming from absorb phase from a bioavailable phase. So that
tells me that maybe this actually is not a very highly,
hydrophobic, natural organic carbon that's holding onto
these monos and di's.

You know, it's just thoughts. I don't know if I
even have my thoughts around it all that well.

**MR. BRIDGES:** Yeah. To continue the physician
analogy, everybody has heard the expression if you hear hoof
beats, think horse, not zebra. Right?

**MR. MAGAR:** Where's the physician?

[Laughter.]

**PANEL MEMBER:** Who's your doctor? Because I don't
want to go there.

[Laughter.]

**MR. BRIDGES:** The point is somebody comes in with
a sore throat, you know, it's a sore throat. You don't
think Dengue fever, necessarily, right? You don't think
zebra. You think something common first.

Even though there was the observation made about
oil -- and it does still concern me -- it's yet to be
demonstrated, I think, that there is any evidence that you
need to torque the whole operational practice at this point
on the basis of somebody observed sheen that remains unquantified. I think maybe there could be recommendations in regards to monitoring in Phase 1B until -- I am going to keep saying that until I get really irritating to many people.

[Laughter.]

**MR. BRIDGES:** If I can move on to the next cycle. That to look at that more carefully, but to bring up the modeling again, we have to have some constrained framework within which to kind of test and evaluate some of these hypotheses. I mean, is it possible or feasible within the laws of the universe that NAPL could be contributing to the load if we use this kind of framework to evaluate the mass balance?

That is where I kind of see continuing value in pursuing that. What would it have to be? I mean, how much would there have to be? Is that consistent with their observations, you know, to evaluate zebra versus horse? Because the consequences of doing that torque are rather significant if that's NAPL because everybody knows, right, dredges are very inefficient at moving liquid.

**MR. MAGAR:** If we truly think this is NAPL, it
should raise a lot of questions about digging this stuff up and disturbing it.

MR. BRIDGES: Right, exactly.

MR. MAGAR: That should really give us pause as to whether or not we should be putting a big dredge bucket right in the middle of a pool of NAPL.

MR. BRIDGES: Well, I mean, it's bad practice.

MR. MAGAR: That's not best management practice.

MR. BRIDGES: Uh-uh. But I don't think there's evidence on the table other than observation yet, and I think there needs to be more monitoring along those lines, but I think before that time, there needs to be more hard analysis, using modeling or whatever to see -- to try to bound that some and determine is it reasonable or feasible that this could be making a large contribution and that -- I don't know.

That analysis so far of the Phase 1 data is just too loosey-goosey at this point, you know, to reach judgments about the contribution of oil.

MR. MAGAR: Any of you guys get why they couldn't measure it in the sediment that came up?

MR. BRIDGES: I don't even know if it is PCB oil.
As far as I recall, I don't remember it being sampled, per se, the oil itself.

MS. HOLLAND: Victor, is that a question you want answered outside the panel?

MR. BRIDGES: I mean, it could have been an old oil can that Farmer Joe threw into the river 15 years ago or whatever. A sheen is a sheen. I mean, it is not a chemical analysis.

MR. THOMPSON: But I think in this case, it's a horse. We can potentially surmise it's a horse because that is the source, PCB oils for the source to the river.

MR. BRIDGES: I know, but that's not the only thing in the river.

PANEL MEMBER: It's what?

MR. BRIDGES: Are you saying there are no oil cans in the river?

PANEL MEMBER: Not in this river.

[Laughter.]

MR. BRIDGES: I'm just saying if it's a sheen, you know, lots of things make sheen. Hairspray makes sheen, you know.

PANEL MEMBER: I understand what you're saying.
MR. BRIDGES: Yeah.

MR. FUGLEVAND: Rick raised the issue of NAPLs, and I think the main thing is there's an unresolved issue moving ahead that could, in the monitoring portion, do some more to understand it better, and then the adaptive management approach.

And I don't think we saw any evidence of a NAPL pool. There wasn't evidence of dripping oils out of buckets that we heard described. It was more of sheens reaching the surface, and so it's somewhere in between.

MR. FOX: Well, I do a lot of work on manufactured gas plant sites, and you get these coal tar stringers, and sometimes you can core all around it and not see it or barely see it, and then you start mucking around in it, and you get these big sheens coming up.

So I think one of the issues potentially is that when they did the pre-design characterization, they probably weren't thinking oil and maybe not looking for it, and it should be a colorless oil that -- I don't know -- maybe it fluoresces, or if you put it under a fluorescent light, you maybe could look at it quickly. It might be a question for St. Germaine.
MS. HOLLAND: If you are going to ask a question, use the mic, please.

PANEL MEMBER: Yeah, that's fine.

PANEL MEMBER: That's all right.

PANEL MEMBER: I was going to make an observation, but I was asking Andy Seeford [sic] had gone home because --

ATTENDEE: [Speaking off mic.]

MR. THOMPSON: Oh, Silfer. Sorry. I always get his name wrong.

Because I was going to make an observation, but you guys may know this. I believe on the Housatonic, they actually encountered a situation where there was high PCBs on sand, and they had no idea what was going on there. And I think they conducted some SEM. I was looking to see if anybody from the Hous was here, because they did end up finding some oil particulates, oil particles adhering to the sand.

Yeah, I was looking for Susan because I remember reading that at one point.

MR. BRIDGES: I think from my discussions with Susan about that was they had some weird bio -- well, weird -- they were biofilms, as I recall, that -- on some of the
sand particles that could have been associated with the PCBs, right?

So, typically, hydrofor organics don't associate with coarser grain material because there's not a whole lot of organic carbon or whatever to bind with, but they had some sand particles that seemed to have biofilms that could have been responsible for that. I don't know how conclusively it was ever demonstrated.

MR. THOMPSON: My only point was we were looking for pools of oil, per se, and I'm saying that may not be the case based on -- again, this is only a partial recollection. I actually had those papers at home. Susan supplied those for me as well.

I'm just suggesting if there is a way that could be part of these sediments. I don't know.

MR. SCHROEDER: There was an underground oil source in the Housatonic that transported to the stream bed.

PANEL MEMBER: There was oils, yes.

PANEL MEMBER: I mean, they knew a source on land, near shore, near the bank.

MR. THOMPSON: And we know a source here. That is the source, oil. PCB oils are the source to the Hudson as
well. I don't know that we need to pursue this, for
goodness sakes. I just was only trying to suggest a
mechanism other than looking for large pools within the
sediments.

I also think -- was going to pull up the report
here. They did make considerable effort. It wasn't that
they didn't try to capture this. So we'll have to think
about it, but I don't know that we'll end up being any
smarter than they were about trying to do it. They were
aware of it. All we can do is continue to say -- I suppose
you could quit looking at it, which was kind of what I was
hoping Don Hayes was going to have some brilliant ideas when
I put him on the spot, say what kind of information you
would need.

MR. BRIDGES: But you can only come up with so
much in 24 hours.

MR. THOMPSON: That's true. That's right. He was
probably exhausted from working on that information from
last night.

Peer Review Contractor Summation,
Schedule Review, and Next Steps

MR. FUGLEVAND: So I'd like to, again, kind of
change focus to schedule. We are kind of starting to wrap 
up this meeting. We'll be done here in another 45 minutes, 
but one of the very real issues for the panel is the 
schedule to our report.

When we were first engaged last October, the focus 
was the introductory session in February with getting the 
reports the end of February and then having our deliberation 
in May and our report end of May, first of June. And part 
of that schedule, that schedule was largely driven by EPA 
and GE's desire to get our report, get some decisions made, 
so they can start to plan for next year being back in the 
field.

I think as a panel, we did everything we could. I 
think we worked hard to honor that.

We're at a stage now where we just received more 
documents this week that are appendices to the May 8th 
document, and right now we're on a schedule of getting our 
-- SRA getting our report to EPA the end of June.

So I just thought it would be good to have a 
discussion here of some input from the panel members of what 
you think of that schedule moving ahead to get to our draft 
report.
MR. BRIDGES: Well, I’ll make the observation that there are multiple models for conducting a peer review. One model is you hand somebody over a finished product of some sort, and you ask them to render an opinion about that.

When I was first contacted about this project, that was sort of my understanding of the model that was contemplated.

Another model which is more similar to the one that we appeared to be operating in is more of an iterative peer review; that is, you get material to consider over time, and you provide feedback, whether informal or formal on that material as you receive it, and you move forward.

So I am kind of wondering what the expectation is of whoever the client is or the sponsor of the peer review. How are we supposed to be operating? I guess we could shut down, if you will, information flow today and just comment on whatever we have and whatever form we have it with whatever degree of uncertainty of knowledge we have about what it is we have -- that is one mode -- or you can continue to operate more in this sort of iterative fashion where you get additional material over time.

I don't want to disparage the secondary model
because I've participated in peer reviews in both forms. The iterative model in one case, that went on for 2 years. I'm not suggesting that in this case. I'm just saying in one case, it went on for 2 years in an iterative mode, and I thought it was very beneficial in that case because it was a very complex project, hadn't been done before, and we gave kind of iterative input over time as it was needed by the team.

So I think, as I have indicated previously, my interest is in providing maximum value to the project, period. Okay? That's why I was interested in investing my time in this, and that remains my motivation.

So that begs the question what provides maximum value to the project, and maybe that's a separate question than how the client wishes the panel to operate.

**MS. HOLLAND:** And, Todd, is that a rhetorical question right now?

**MR. BRIDGES:** Yeah. I'm just making --

**MS. HOLLAND:** When do you want to ask that directly to the --

**MR. BRIDGES:** Yeah. I will let the chair decide when he wants to ask.
MS. HOLLAND: You let them know that.

MR. BRIDGES: But that's my view about it. I just want to maximize value to the project, and whatever form or model we are supposed to be operating, I would like clarity on what the model is for sure because it's evolved a bit, and I've lost some clarity as to how we're supposed to be providing our input. Maybe the client just wants to bring it to a close, give us the best you got, and we'll make use of it, or maybe the client thinks that there would be value in providing additional information.

Because, like you indicated, we are -- our first draft of our report is basically we have to have it prepared by the first of June, and GE has indicated that they're doing a substantial amount of work that they wouldn't be prepared to deliver to us until then. Well, I mean, the first draft of the report is written. So I guess the report won't consider that or any other materials that EPA may be, you know, Phase 2 of Donnie's analysis. I don't know. I mean, I don't know what other materials are contemplated or are in the pipeline, but we're rapidly -- in the current schedule, we are rapidly running out of time to even think about it, let alone, you know, try to incorporate it into an
analysis that we would include in the report.

So long way around, I would like clarity on what model we're operating under, so that we can just proceed accordingly, because we have evolved.

ATTENDEE: Hey, Todd?

MR. BRIDGES: Yeah.

MR. GARON: This is just a clarification, but our draft report is due to EPA at the end of June, not the beginning of June.

MR. BRIDGES: Right. Well, I guess I'm talking about our iterative schedule.

MR. FUGLEVAND: Kind of our internal working draft, we can start to polish.

So one of the questions would be -- I mean, we initially anticipated that the first type of process, where we were going to get a document in February and we had a schedule to get a report in June, now we've gotten substantial additional information.

If we were to -- and I'm not proposing. I'm just kind of as one alternative. If we were to cut all information off as of today that we receive as far as this Phase 1 evaluation process, what's the different panel
members' sense about ability to meet the June 30 deadline?

Is it reasonable?

**MR. FOX:** Tough but reasonable.

**MR. FUGLEVAND:** Tough but reasonable.

**PANEL MEMBER:** Yep.

**PANEL MEMBER:** Unreasonable but manageable.

[Laughter.]

**PANEL MEMBER:** Same answer.

**PANEL MEMBER:** Yeah, I think June 1st is fine.

**MR. FUGLEVAND:** So we're saying that if we cut everything off today --

**PANEL MEMBER:** But cut everything off today.

**MR. FUGLEVAND:** -- we got a big chore ahead of us, but we could -- nose to the grindstone and meet the June 30 date.

**MR. BRIDGES:** Well, yeah. I mean -- well, I'll say this. I mean, I think it's -- we could produce a report. I guess the question beyond that is what's in the report, and does it address everything that the project -- because I don't even know who the client is, quite honestly -- everything that project desires would be in the report or not? That's a separate question, right?
We could have prepared a report probably 3 months ago, you know. I mean, you can write on what you have in your hand. The question beyond that is will the report contain everything that the project wants it to contain in terms of analysis or consideration.

MR. FUGLEVAND: Yeah. So it seems to me -- and I don't know if EPA or GE are able to kind of offer any insight into the process. I mean, GE is talking about additional information for our consideration that would happen in June. You know, I don't know where EPA is at. So where do we stand? Where do we stand on this process?

MR. HAGGARD: I mean one thing, we told you about the modeling results, and we're still working on -- the other point, though, is we received, as you did, 211 pages from EPA in which there is going to be a comment period, and all the comments are going to go to you for -- the public and us on their addendum, and I don't think that closes until May 17th. So you'll get additional input on May 17th. Yeah, so that's next week.

PANEL MEMBER: I didn't think about that.

MR. SIMON: Paul Simon with EPA.

PANEL MEMBER: I didn't either.
MS. KLEE: Well, in addition, you know, the EPA and GE are jointly clients in the sense that we have a Consent Decree that lays out this process. So, from our perspective, we do believe that having the opportunity for you to go through this information, whether it's an iterative process you're talking about, having an opportunity to see the results of the modeling work and potentially reconvening in July to discuss the modeling results would be very beneficial to us to get your input on what is -- you know, just the critical issue here, the load, kind of deal with the load.

MS. HOLLAND: And I think, Paul, you wanted to say something?

MR. SIMON: Yeah. It's true about the comment period on the addendum closing on May 17th. So the public has until then to provide comments on that, and we'll be obviously making this available to you right away.

There needs to be a finite process for the peer review. There are schedule constraints or implications for the season next year, and those are important to us.

We would not support having another peer review session.
There are discussions with GE that are outside of the peer review process between EPA and GE, and things like the model, I'm sure will be discussed. There are timing constraints on those too, but those are separate from the peer review timing issues.

So I don't think we would support waiting until the GE model information comes in, in June, because even then, that itself is a delay, and then we would need to respond to that. And there would be an opportunity for public comment on that. So that would be at least a several-month delay, as I see it, in you producing a report. That's not something that we could support under the circumstances.

**MS. KLEE:** Can I say -- this is Ann Klee.

**MR. FUGLEVAND:** I got --

**MS. KLEE:** I would just like to clarify because that is not what GE was proposing. We were not suggesting that you delay the preparation of your report in June.

What we were hoping that you would consider is an additional meeting but not delaying the report, because we think this discussion has been very helpful, and that as a separate part of the process, we think it would be helpful
to get input from you on the model, both with respect to the Upper Hudson load and the model itself.

But, just to clarify, Paul, we were not --

MR. BRIDGES: Okay. So, to ask a question on that, so what you're saying is separate and apart from the review that we're conducting now, there would be a separate kind of meeting and input provided on the modeling work? Is that what --

MS. KLEE: I think what we would envision, it falls more into the iterative kind of model that you responsible describing, that there is input in the first -- based on the information that you've received to date with the May 17th submissions, and that that would be included in your June submission. That there would be then the second iteration, which would be what we were proposing that you consider as a meeting in July that would be a next step, but you would not hold up the first step.

MR. FUGLEVAND: I just have a couple comments, and one is we heard -- and we were stressed starting in October -- the importance of schedule, of keeping this whole thing on schedule, and I am fairly frustrated with the fact that the schedule was predicated on we're going to get stuff to
you in February, so you can get your stuff done.

And we have documents dated May 1, 277 -- I mean
211 pages, and so it almost seems insincere to say you're
concerned about schedule.

And I only say that, because I know you've all
worked your tail ends off, that it's not as simple as
putting a date on a piece of paper. That it's taken you all
the way to May to get stuff sorted out, and so then, to turn
around and say, "But we want you guys to get your work done
on schedule," it's almost disingenuous because it's equally
complex for us.

The second thing is the old adage, there's not
enough time to do it right, but there would be enough time
to do it over. And I ask the question on the iterative
process. Is it worth saving a month now, or is there a
benefit in this very complex process of having an extra
month?

And I think in our conversations as a panel, we're
very willing to take the information we have now, put our
nose to the grindstone, and plow ahead and get a document,
end of June.

The one concern we've had is that in so doing, if
the process continues, our effort becomes almost inconsequential because you continue a process that moves beyond us, you know, in more modeling and that type of thing.

So we want to make sure that our efforts are our contribution and not just a check in the box. So, again, I think we're willing to plow straight ahead, but we're also wanting to have a sense of how we actually fit in the process in a timely and effective manner.

**MR. MAGAR:** And I'd just like to ask, to what extent is our process in the critical path for design and construction, because I would assume that there's some level of design and that GE can still be making progress towards next year, that that does not necessarily depend on what -- or outcome.

**MR. SIMON:** Let me take the last question first.

There are some things that can happen in parallel. There are discussions between the parties that can happen in parallel. There's design work that can happen, at least to some extent, in parallel, but there is a critical path element that the peer review process is a key part of under the terms of the Consent Decree.
Paul, your point, I apologize it took us as long as it did to get the addendum to you. As you, I think, recognize, it's not because we weren't working very hard, and I regret that we weren't able to give it to you faster.

And if I think there's been some discussions with Steve Garon about maybe you needing to put potentially a few more weeks to look at the addendum -- and that's fine. If you feel you need that, we respect that totally, but the process my colleague was talking about, I don't think we would support that. I think another peer review meeting, that's, in our eyes -- that's sort of a much bigger potential play, with sort of an uncertain -- how does that fit into the peer review process? How does that fit into the Consent Decree?

MR. HAGGARD: This is John Haggard.

I guess the question is, is the panel willing to do that, assuming we could have a discussion and a little more time to discuss this with EPA? Is the panel willing to consider additional participation?

MR. THOMPSON: I would speak for myself to say yes, I would think so, but the caveat is we could not produce a report and then get your modeling report and then...
have a meeting after that. I think we'd almost just about cease work, at least on any of the material you guys are provided, because you've made very clear this week that the model is a critical part of your proposal for changes to the standard. So we would need to evaluate that very carefully.

I mean, right now, you know, I joked earlier, trust me -- and I have a great deal of respect. So, to some degree, I do, but there is the -- what is it, Todd?

MR. BRIDGES: Huh?

MR. THOMPSON: Reagan? Trust but verify?

MR. BRIDGES: Mm-hmm.

MR. THOMPSON: So we'd need some time to verify. So I think it would necessarily delay our report.

MR. SIMON: Can I just add one more thing? I forgot one of the points, Paul or Victor -- I'm not sure which made.

I am sure that what you produce is going to be very valuable, and I don't -- I can't imagine that it's going to be moot because of additional information.

Yes, of course, there are going to be additional discussions, and more data is going to be gathered, and that's going to happen probably for years.
But I can't imagine what you produce not being very valuable and very, you know, pertinent.

**MR. FUGLEVAND:** Again, the thing I was thinking was basically what Tim had just said, that we heard a very strong plea made this morning by GE saying the model is the key, and so we're kind of sitting there in a position of -- and we can go ahead and evaluate from what we have now, GE's proposed changes, but some of their proposed changes are into the future of more process.

So, if we do some sort of evaluation, it may not be as complete as we might all have desired in the beginning, and that may just be the nature of the process.

Tim?

**MR. THOMPSON:** How would we get peer review of the model? I don't know if anyone here is truly qualified to do that.

I think it would be very difficult to see the model for the first time, if that's both us and EPA. That would be very challenging. And just seeing an outcome or a graph that might look very compelling, I would have no way to determine whether -- what the foundation of that graph is.
MS. HOLLAND: So are you sort of saying that you don't see much utility in trying to consider going further?

MR. THOMPSON: No. On the contrary. That's not at all -- I actually -- I think I said many times I see great value in the model, and I think I would actually support this more iterative approach very strongly, and I think that I don't see a problem in a month delay or a couple months delay, but that's not my schedule. This is me speaking personally. I don't know what impact it has. That's why I was asking about a critical path.

We are still within the context of 2010. We're not out to 2011, but these are very serious implications or ramifications of the work that we're doing.

But if we were talking about getting together in a month, I think that's a pretty compressed time frame. So I guess I would just like to get some input from GE and just how could we get -- if this were to work, how could get communication?

MR. HAGGARD: Let me add just a little perspective on this too.

We are talking about the GE model and getting comfortable with the GE model, and we have the honorable
John Connolly and his group, who are very well respected, but that aside, I mean, what you're faced with, though, is a dilemma.

We have EPA saying 2,000 is okay, supported by the results of a model that they discredit. So they don't have a model. They have a number.

We do have a model, and we come up with 1,200. So how do you choose? I mean, you're really in a very difficult spot here where the tool we need to really take a hard look on the load and consequences of the load is not really available to you because the number EPA has given you is based on a tool that they themselves say is not reliable.

MR. SCHROEDER: So, if I can comment on what I am hearing, it seems to me that, to some degree, we could readily give perhaps some sort of more definitive final answer on maybe residuals and productivity but not resuspension. Is that kind of what the take is here?

MS. HOLLAND: Are you addressing that to each other? It's helpful -- you're looking over there.

MR. SCHROEDER: Well, I suspect I'm asking both GE and EPA. I mean, that's sort of the position that I hear, that, you know, we can produce this product. It may be
definitive, fortuitous -- two of these standards and not the third, and so, you know, it would have lots of meaning for at least two-thirds of the standards, what we'd produce now, and then there's going to be a debate later about the other one.

**MS. HOLLAND:** I think Paul is ready to answer your question.

**MR. SIMON:** The last thing I want to do is get into a legal argument.

[Laughter.]

**MR. SIMON:** There are issues about what the Consent Decree provides, and there's a time period for producing certain things, including proposed performance standards. At this point, we're past that time.

I think that while there is some additional model-related information that GE is apparently putting together, they have presented a significant amount of information already on even the third performance standard, resuspension. And, obviously, EPA has presented something itself on resuspension. So I think that you have, you know, some grist for the mill in terms of all three performance standards already.
MR. FUGLEVAND: So I think --

PANEL MEMBER: One interesting --

MS. HOLLAND: I think GE is wanting to respond.

PANEL MEMBER: I mean, to follow up on what Paul suggested -- and maybe not a suggestion -- number one, there is not a deadline for the peer review in the Consent Decree, but that aside -- and I'm not a lawyer, but the idea that there may be a process whereby you can take the information we have submitted and potentially one of your recommendations could be that you qualify with opinion with the model needs to be peer-reviewed, and that's another option.

We have provided a draft calibration summary report, validation report. So, a consideration like that, we could follow up.

And GE is willing to convene a group to do this, and we'll try to work with EPA, and if not, we can do it ourselves to do a review of the model.

MR. FUGLEVAND: I think that we've had a good discussion, and I think we can just, I think, wrap it up by saying we're willing to do whatever I think GE and EPA think is the right thing to do on the peer review, and we will
need some direction, like Todd mentioned.

We're prepared. We've talked about it, that to take off here and leave tomorrow and work towards a report, by the end of June. But doing the report by end of June means we really can't absorb any more information.

If there is a desire to have us consider other information, then give us that direction, and I think there are some maybe legal issues between the two parties, that this isn't the place to discuss those, but after you do, to give us some -- I think that if -- if the parties wanted to take advantage of the panel for some other subsequent issues, my conversation with the panelists, I don't think anybody would be opposed to that, and we have suffered through a lot of a steep learning curve. So it might make sense to take advantage of that as well.

But, again, I think some of those issues are more administrative between the parties and don't really involve us. The main thing we need and we would, you know -- timely as important is -- is direction, you know, next week on -- on which path are we heading, and so we know.

And it may be that you say to us, well, let's delay your process for a month and we have to sort things
out, or it might be June 30th is the date, or it might be
iterative or whatever, but I don't think it's appropriate
for us to expect you to give us an answer today, but we're
glad that we had a chance to discuss sit with you, so you

kind of have a sense of where we're sitting right now.

MS. KLEE: Could I respond to that?

Could I make a suggestion that we get together
with EPA over the next few days and discuss the legal issue,
that we don't think exists but that you do, but that we
commit to getting back to you by early next week with how
we'd like to proceed and offer it as a joint recommendation?

MR. FUGLEVAND: Yeah.

MR. THOMPSON: This is actually a question getting
to schedule.

I got to believe that you've got plans drawn up to
do CU-9 through CU-15 already. I mean, those must have been
in existence because you guys were planning to do those in
Phase 1 anyway, weren't you?

The question that I am ultimately leading to is I
would almost think you'd have the plans drawn up, what you
need to do next year if you were going to go to work.

MR. HAGGARD: It's not that simple.
The original contract we had with contractor did Phase 1. Those specs included all the CUs in Phase 1.

PANEL MEMBER: Right.

MR. HAGGARD: And they didn't get there, obviously.

So then the CUs flipped to Phase 2. We don't have specs or plans, performance standards, contracts for Phase 2 efforts.

So we don't have specs, but we know -- you know, we've got the dredge prisms. We got the design. We know the equipment type, but what changes as a result of what we learned in Phase 1 --

MR. THOMPSON: But do you have the plans and contracts to do the rest of the CUs that were originally targeted in Phase 1?

MR. HAGGARD: No. We do not have contracts in place.

MR. THOMPSON: Okay, okay. That's really important to understand. Thank you.

MS. HOLLAND: So, Paul, where do you want to go?

PANEL MEMBER: I understand the schedule now.

MR. BRIDGES: Can I just ask -- I wanted to ask
EPA just one clarifying point on this.

As of now, EPA has no plans to submit any other information to the panel?

**MR. CONETTA:** No.

**PANEL MEMBER:** Okay.

**MS. HOLLAND:** Except the public comment.

**MR. CONETTA:** Public comment schedule for it but no other information.

**MR. FUGLEVAND:** So any other comments or issues with the panel on schedule?

[No response.]

**MR. FUGLEVAND:** So now what I think -- we're now kind of in the wrap-up phase of this 3 days, and one of the things I mentioned earlier was through the course of today's conversation, we may have talked about stuff that somebody on GE or EPA may have just a burning desire to clarify, one side or the other.

So, if we could each take -- if you could just take, you know -- again, take 5 minutes to just -- if you have any issues that you just want to make sure we heard -- you had a chance this morning, but we had more discussions today -- you could do that.
MR. CONETTA: I think we just want to reiterate our thanks for the time. I think we've talked about -- just about everything we can at this point.

[Laughter.]

MR. FUGLEVAND: Okay.

MR. CONETTA: I don't know how much more we can add to the process too. There's enough there already for you guys to consider, and we appreciate the time and the effort and the consideration that you guys have all put into this. Thank you.

MR. HAGGARD: I mean, a couple of issues we wanted to touch on -- one of them, we just went through, I think, to clear terms on load and the modeling and how centrally important that is to looking at the performance standards. So, as Ann said, we're going to try to sit with EPA, and we'll get back to you on how can move forward, but we are moving ahead with the model.

If you'll just, I think, bear with us for a little while longer -- but also recognize that you're in a position where the load standard also supported by EPA is now based on a model that really has been discredited. So you're in a tough spot where you don't have a formal approved tool.
We also look at the productivity, and subordinating that to the residuals and productivity, we think it does make sense. One thing you think about the productivity, though, based on what we've seen with the data, we don't see that slowing the project down has any benefit in terms of reducing the load.

Theoretically, there had been some discussion about if we're dredging slower, you might have less load. We haven't seen that.

So, while stretching out the project might reduce the peak concentrations in the water, we don't see that it is going to have an impact on reducing the overall load. That's not suggesting that changes to the approach to the project might not reduce load, but just stretching it out without making other changes, we don't think is going to have any real benefit.

The other is on the redeposition, to try to keep in mind what's going on at redeposition. We should have additional data -- and I know that is sort of something you may or may not be able to look at -- on fish. We are collecting fish in the Upper Hudson River right now, and we should have that data in June also for fish, both from the
Upper and Lower Hudson River.

We do agree that the depth of contamination, the ability to collect additional data for Phase 2 is something that could make sense and could help very much streamline the process.

We were listening. There was some discussion about our proposal being that we would sample and then redredge potentially and have sort of an iterative process, and just to be clear, that's not what we're proposing.

What our proposal is actually we have updated tables that we'll give to you on clarifying the standards, that we would sample in low-confidence areas. We would convert those low-confidence areas to high-confidence areas, and then we would dredge once in those areas. But we would then sample -- and the idea of maybe recover first and then sample, but we'd then sample to determine if it should be just a cover or cap. So that should streamline that process quite a bit.

The broader community about the incentives, that is a very interesting discussion about where does the incentive lie. I guess behavior of individuals or companies or organizations on the project.
We're all under a microscope on this project, number one, and, number two, our company, as I'm sure are all organizations, we have a very high level of integrity, and, hopefully, you see that with the people we have, with the effort we put forward on Phase 1.

And I know you weren't suggesting or impinging on our character in any way, but from the very highest parts of the company, I will tell you if myself or anybody else on this team did anything to steer the data, to try to manipulate, we would not be long for this company. I guarantee you that would be the case. And my boss is here, and I guarantee you that I would not be here much longer at all if that happened. It's an important project to us, and we want to do it right.

**MS. HOLLAND:** Your 5 minutes are about up, John.

**MR. HAGGARD:** So the motivation here, I think we all are trying to get this done, and I suspect EPA is doing the same. We have different views on how to do it and how to get it done, though.

So we are going to try to proceed and move forward, but let me just thank you again. Hopefully, we will continue to be able to interact with you on this
project, and you do have a lot of information. We're going
to get you a little bit more to try to make things a little
clearer.

    PANEL MEMBER: Not more.

    [Laughter.]

    MR. HAGGARD: Relatively straightforward.

    Thank you.

    MR. CONETTA: Let me just correct one thing. They said a couple things about the model being discredited, and I think that's important for us to -- I hate to do this, but the model was peer-reviewed. Both of them were -- and I'll give it to maybe John to follow up on that. That's something I think -- it's a misconception to say it's been discredited.

    MR. WOLFE: Okay. Wow!

    MR. FUGLEVAND: So 1 minute.

    MR. WOLFE: Okay, 1 minute.

    [Laughter.]

    MR. FUGLEVAND: So 60 seconds.

    MR. WOLFE: So I will speak off the cuff about the modeling. I'm John Wolfe. I'm with Limno-Tech.

    We did the modeling some 10, 12 years ago that was
the basis of the ROD that has been -- some model results have been shown.

As Benny said, it was extensively calibrated and validated and peer-reviewed at the time, and on the issue of discredited or credited, the way the procedure that's in the guidance with the -- I think the model against -- against data since the model was put together, the only materials I've seen to speak to that so far were some water column datapoints in 2004 to 2008 versus model predictions.

We should be clear that those model predictions were based on an assumed set of flows that were guesstimate at the time. Flows, in fact, were roughly 20 --

MR. FUGLEVAND: Fifteen seconds, please.

MR. WOLFE: Okay.

[Laughter.]

MR. WOLFE: And so the -- again, the issue of crediting or discredited really comes down to a formal post audit of the model, which we looked off.

MR. FUGLEVAND: Okay, good.

MS. HOLLAND: Thank you.

MR. FUGLEVAND: Thank you.

MS. HOLLAND: Steve still needs to do his wrap-up
at the very end. Is there anything else you folks want to do?

MR. HARTMAN: Could I ask one question real quick? If we going to get additional data in the -- how are we going to obtain those data?

MR. FUGLEVAND: Say, Greg, we're going to wait until --

MR. HARTMAN: Okay.

MR. FUGLEVAND: -- Monday or Tuesday to find out what we're going to get.

MR. HARTMAN: Okay.

MR. FUGLEVAND: So, right now it's in their hands, between EPA and GE, to decide what we're going to get and what schedule. So we're going to try and --

MR. HARTMAN: Okay. We'll hear from you Monday, then.

MS. HOLLAND: Paul, anything else?

MR. FUGLEVAND: Is there anything else from the panel members?

I think I can speak for all of us that it's also a privilege for us to be able to be here and participate. I mean, the information from both sides is amazing. I think
I'd be the first to say that probably the word "herculean" is an understatement for what I know has gone on in both shops over the last -- not only 6 months but, you know, some time. To take all the data you had and do all of the work you did since November, I think, is -- you know better than anyone how significant it was.

We just appreciate the opportunity to be part of that process, and we don't want to underestimate our respect and appreciation to all of you for what you're doing.

And we will try to be as honest and complete as we can be with our report in just respecting all the work that you've done.

So we look forward to hearing from you next week, and we are going to turn it over now to SRA to kind of take us through the wrap-up of the week.

**MR. GARON:** Well, you've had 3 days of substance.

Now you have 5 minutes of procedural stuff.

I just want to do a little bit of housekeeping before we adjourn. First of all, all the materials that were presented or shared over the last few days will be available or are already available on the GE or EPA websites.
I understand that GE's materials will be up by the end of today, and EPA's will be up by the end of tomorrow. Is that correct, Kristen?

**KRISTEN:** [Speaking off mic.]

**MR. GARON:** Okay, thank you.

Also, I want to mention that we have recorded this meeting for the purpose of producing a transcript, and we intend to provide that to both parties by May 21st.

Kristen, will you post that on your website as well?

**KRISTEN:** [Speaking off mic.]

**MR. GARON:** Okay.

Quickly, I just wanted to go through the schedule, which I was going to mention before we had that last conversation that it was subject to some change and there might be some flex in it.

A couple of dates are firm, however. First of all, the public comment on the EPA Phase 1 evaluation report addendum is happening now, and it continues through May 17th.

I wanted to point out, a couple folks have asked us about the opportunity to provide comment on what they
heard during these proceedings, and that is the best mechanism to provide those comments. So you can provide comments on the addendum itself or on what you heard, all the new information that you've heard over the last few days. When the public comment period closes, those comments will be sent to us, and, once again, as we did with the comments on the Phase 1 evaluation reports, we will send those to all the panelists.

Right. I also want to mention that anything that we have received in hard copy this week, we will take back. We will scan, and we'll send those to the panelists early next week.

So, with the other items on the schedule, the current schedule is that the draft peer review report will be submitted to EPA and GE by June 30th. Regardless of the date, whatever date is ultimately agreed on, both parties will have a maximum of 14 days to perform a factual review of that report.

Thereafter, SRA will have to address any factual issues within 2 weeks. The current date for the final peer review report is July 28th, but, again, that is subject to change.
I think that's it in terms of housekeeping. Like everyone else, I just wanted to say thanks to everybody, to the GE and EPA teams for all your preparation and your responsiveness, to the panel for your contributions, your wit, and making my life more difficult.

[Laughter.]

MR. GARON: Thank you, Melinda, for facilitating us, and last but not least, Glen the sound guy for keeping all the mics at the appropriate level.

We've had three exhausting days. So I don't need to talk any longer. I wish you safe travels back home, and thank you.

We are adjourned.

[Applause.]

[Whereupon, the meeting was adjourned.]