PUBLIC HEARING

SYDNEY TAR PONDS AND COKE OVENS SITES

REMEDIATION PROJECT

JOINT REVIEW PANEL

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V O L U M E  2

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HELD BEFORE: Ms. Lesley Griffiths, MCIP (Chair)
Mr. William H.R. Charles, QC (Member)
Dr. Louis LaPierre, Ph.D (Member)

PLACE HEARD: Sydney, Nova Scotia

DATE HEARD: Monday, May 1, 2006

APPEARANCES: STPA (PANEL):
Mr. Frank Potter
Mr. Gregory Gillis
Mr. Shawn Duncan
Dr. Brian Magee
Mr. Donald Shosky
Mr. Wilfred Kaiser
Dr. John Walker
Dr. Malcolm Stephenson

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--- Upon commencing at 1:04 p.m.

THE CHAIRPERSON: Well, good afternoon, ladies and gentlemen.

I'd like to wish you a happy May day. It's a beautiful day out there, and thank you for coming in out of the sunshine to participate in this hearing.

My name is Lesley Griffiths, and I am the Chair of this Environmental Assessment Review Panel.

On my right is Dr. Louis LaPierre. On my left is Mr. William Charles.

I'm going to say very little. You will be relieved to hear, at the beginning. I do want to let you know that the panel did prepare a detailed hearing's procedures, which will guide proceedings during the next -- until May 19th, and if you do not have a set of those, or you wish to have some, please speak to Ms. Debbie Hendricksen, who is just over on my left and she will be able to provide you with copies of the proceedings.

There's nothing much about the proceedings that I need to tell you today, because today, just as Saturday, is a day that the panel has reserved for our questioning to the proponent. So, we will be continuing with that process.

Tomorrow, as you probably all know, we are then going to move on to questions from the public to the

proponent.

So, we'll -- when we begin tomorrow's session, I will have a little bit to say about the procedures we're going to follow with respect to questioning.

I just want to say one other thing though about process, in case we have new people in the room who didn't hear me say this on Saturday, and that is that -- as I'm sure you're all well aware -- we need as a panel to be totally impartial and we need to -- anything that we hear and receive from anybody, anything that anybody says to us during this review process, needs to be said publically, it needs to be recorded, it needs to come through microphones.

And this means that, I'm afraid, we can't engage in any private discussions with anybody during the hearing.

So, I would ask your patience and ask you not to try and come up and speak to us. It's not that we're unfriendly. We'd be very happy to talk to you under other circumstances, but we can't during this particular process.

Before we begin our questions from the panel to the proponent, I would like to ask the proponent, if we can deal with some housecleaning issues.

And so, I believe, on Saturday you made some undertakings to provide us with information, and I believe that you have a number of those that you're ready to present, that's item number one. If you have any points of clarification that you would like to make with respect to answers that you gave on Saturday, we'll allow some time for that.

And finally, I believe we had two questions that were deferred because Malcolm Stephenson was not with you on Saturday.

So, if you're prepared for those, we can also pursue those, or we can do those later.

SYDNEY TAR PONDS AGENCY

--- QUESTIONED BY THE JOINT REVIEW AGENCY

MR. GILLIS: Thank you very much, Madam Chair.

First of all, Dr. Stephenson is with us. I'm not sure the panel can see him. He's behind the screen there on my left and to your right. So, he'll be available to respond ---

THE CHAIRPERSON: Well, I will take your word for it.

MR. GILLIS: There are a number of understanding as you mentioned.

The first one related to -- I guess it

didn't make the list of understandings, but it was a question that was posed that we wanted to make sure that we had a response to.

It related to a question from Dr. LaPierre regarding the calculation of destruction removal efficiency.

And I would ask Dr. John Walker to provide an answer to that question, please.

DR. WALKER: What we undertook to provide you was a reference on documentation of the definition of DRE, and I have that with me, and we'll bring it to you.

It's taken from Chapter 40 of the US Code of Federal Regulations, and it is Section 264.343.

And, essentially, what it says is that the destruction removal efficiency is that amount of material that goes into a process that is not emitted to the air, and it doesn't appear in formal Canadian legislation; however, on a couple of project bases the Nova Scotia Department of Environment as well as Environmental Canada has accepted the same definition as used in the U.S.

So, shall I bring that ---

THE CHAIRPERSON: If you are presenting something to the panel, I would appreciate receiving one copy for the panel, one copy to go to the Secretariat, and we can formally put that in, if that's possible.

DR. WALKER: Thank you, Madam Chair.

Now, we have also -- we would be quite prepared at this time to discuss how the DRE is actually measured in the context of test burn, which I'm sure we will be doing at some point in these proceedings.

We could do it now, or at your wish defer it.

DR. LAPIERRE: I think it would be best to wait, because -- we certainly want to get back at it, but I would like to read this first.

THE CHAIRPERSON: Thank you, Dr. Walker.

I just want to make a little check here. I'm sure you will let me know in the back, if you can't hear.

So, do that.

UNKNOWN VOICE: I can't hear you very well.

THE CHAIRPERSON: You can't hear me now?

All right. I would just like to remind everybody that I think you need to be fairly close to your mike when you speak.

MR. GILLIS: Thank you.

The second point of clarification was a calculation that Dr. Brian Magee did with respect to PAH concentrations.

And Dr. Magee has gone over his calculations with the aid of a larger calculator, I guess, and he now has some additional information.

DR. MAGEE: Yes, I'm afraid I was a bit hasty when the question was asked on Saturday about what the average PAH concentration was -- that's polycyclic aromatic hydrocarbons -- and I glanced at a table from Volume 5 of the EIS, Table 4.11 -- that is the correct table -- and I was a bit hasty.

When we went back and actually calculated -- remember we have four areas. We have the excavation and the stabilization in the north, and the same in the south. So, there are four areas.

If we take just the three ring and higher compounds as a definition of PAH, the range for these four areas for the upper 95th confidence interval is 3900 megs per kilogram, which is the same as parts per million to 8300 megs per kg, some people consider that naphthalene should be thrown in and called NPAH. I'm neutral on that topic. But I just will give you the number as when we include naphthalene in as well, and that would be 6200 milligrams per kilogram to 1300 milligrams per kilogram.

The data are all in that Table 411. It's just that we merely added them up with a calculator,

rather than me eyeballing it on Saturday.

So, I apologize to the Chair, but these are the correct numbers.

THE CHAIRPERSON: Thank you.

DR. MAGEE: Sorry, I believe I've made a mistake again.

Sixty-two hundred to 13,000, one three comma zero zero zero.

MR. GILLIS: Thank you, Dr. Magee.

The next undertaking related to providing more detail regarding the extent of bedrock and aquifer information.

The information in this project and the project that we've been given focused on human health and ecological risks associated with shallow water aquifer information.

But what I'll do is, I'll turn the question over to Don Shosky to explain some of the interplay between -- with a deep aquifer.

MR. SHOSKY: Thank you, Mr. Gillis.

We'll put on a slide at this point, will we?

I'll take a moment to give some orientation here. Can you see? If I stand here, can you see? Okay.

I'll give some orientation where the Coke Ovens Site is, the Tar Ponds. We can supply additional cross-sections, but with the short duration of time that we have, I'll verbally go through and explain to you the hydro geologic conditions, as I understand it. And we can follow that up with additional information, if you so desire.

Generally speaking, the groundwater flow goes towards the Tar Ponds, and when we talk about the deeper groundwater flow areas where there's apparently contamination, it's in this area here or on the area here where the tar cell is located.

The depth of contamination goes down to approximately 50 metres. Given that information and the way that the hydraulic stratigraphy is laid out and the elevation changes involved, by the time the groundwater moves from this area here down to the Tar Ponds area, it's almost at an equal level or a slightly deeper level than where the Tar Ponds bottom is, after the monolith has been created.

Is this better? Okay. So, I'll just -- briefly again, this is the area where we suspect the deeper contamination to be, at about 50 meters. The contaminated water, in general, shallow and deep, moves towards the Tar Ponds.

By the time you take into a difference of -- the differences in elevation changes, the bedrock that's fractured that contains the contaminated waters, in this area is almost to the bottom of the monolith or slightly lower than the bottom of the monolith at the Tar Ponds location.

So, the question was, how do these two -- how does the hydraulic interactions occur and what makes this particular containment system safe and how is it monitorable.

And, basically, if we go to the other set of slides that we have -- bear with us for a moment while we get these up -- I believe we want the first one in that series, No. 18.

Keeping in mind that the idea is to try and isolate and manoeuvre the water around the monolith structure, we know that the water is coming down in this direction towards the channel at a very deep depth, shallow waters would be coming towards the monolith.

You'll see that we have a number of interceptor lines with a -- small key sections here for intercepting the shallow waters that may be coming onto the monolith site, and they interconnect with the deeper trench system that we talked extensively about on Saturday. And we have a cross-section of that for

everyone's reference.

The next slide, please. This is the one within the presentation on Saturday.

If we take the orientation of the two together, this one would be lengthwise, up and down the Tar Ponds, as oppose to across the Tar Ponds.

Again, this would be the single interceptor lines. If you were looking back towards the screen into the distance, you would see the "T" area. That would be constructed in an effort to collect any other shallow waters that would be coming.

As we talked on Saturday, once this area is stabilized, which is this area here, the blue area, the question was, how does the water that would come -- potentially come from upgradient that maybe contaminated in the future, how would that ever enter here? Where would it show up and how would it be dealt with?

Our intention is to use these trenches to collect and direct that contaminated water, if indeed it does ever come down to that area, and at the end of each one of those trenches towards the channel that is being constructed, there will be monitoring points that will look for changes in water chemistry that may indicate that an impact has occurred.

So, in detail, here, these trenches are

physically isolated from the monolithic material around it, by virtue of using a high density polyethylene liner system, which has a very, very low permeability.

If you all recall from Saturday's discussion this material here was roughly a clay type of material. It has 10 to the minus 6 permeability as a minimum. That was also underlain by a GC -- what we call a GCL -- which was the clay sandwiched between two sets of fabric, which has a permeability of 10 to the minus 9. Three orders of magnitude difference.

The high density polyethylene liners that are part of this trench system have a permeability of 10 to the minus 14 centimetres per second. Very, very safe conditions from an isolation perspective.

So, in relationship to the surrounding hydro geologic conditions, what the conditions were before the monolith was built, just to give you an idea, we are changing the monolith to make it a permeability of 10 to the minus 6, to that minimum, although our testings show that we were successful in getting 10 to the minus 8 permeability of material here.

The sediments left untreated are about 10 to the minus 3. So, there's almost three orders of magnitude more able to transmit water before solidification than after solidification.

The last -- so to answer another part of the question from Saturday was that these trenches will be used as part of the monitoring system.

And as far as installation of the monolith to ensure that we do not have crumbling of the monolith and that it is a good solid mass when it is installed, there'll be an astringent quality assurance/quality control program that will be put in place, in order to ensure that compressive strengths are met and that the material is placed properly when it's laid down, so that we do not have any problems with fracturing of this monolithic material after it's been cured.

Also, could you go back to the previous slide.

I'd like to take a moment to explain how the interaction occurs along this side of the Tar Ponds as well, because it's important to understand that even though this is left as an open channel that there are protections to the monolith that occur here.

So, as you can see these distinct points here would become monitoring points, along this discharge pattern, along the monolith, but that the monolith, itself, is protected on this side of the construction as well.

So how is it protected? It's protected,

initially, by steel sheet piling that is put in there. And the steel sheet piling is backed up, and the channel once it's clean -- once the sediments that are impacted are cleaned from this channel -- it will be lined with an HDPE liner and that will be adhered to the steel sheet piling.

So, when we're done here, this will be a clean area that would be restored with an impervious liner, as well as some rocks and stones and things like that to create more of a better environment for fish and biota and things of that nature.

Beyond the steel sheet piling, we will be putting in rip-wrap another HDPE liner. Well, why are we doing that? Because we expect that that sheet piling, in and of itself, may only last between -- sometime between 30 and 50 years.

By coming in behind that with the rip-wrap and HDPE liner material, it extends the life of that particular interface between open water -- or not open water conditions, but the channel water conditions which will have water in them all the time, and the material that's behind the HDPE liner, which is the monolithic material.

From that standpoint, that's how that area is protected and the whole capping sequence is then tied

together, both the top and the sides, creating these isolated conditions.

So, hydraulically isolation here, monitoring. If we were to go to the other slide from behind -- you don't need to switch it -- and then monitoring points and protection as well along these other faces.

So, that's how the system all fits together to minimize leeching of potential contaminants.

DR. LAPIERRE: A question.

MR. SHOSKY: Yes.

DR. LAPIERRE: I just want to make sure I understood correctly.

Now, if groundwater was to seep in under the monolith, as you've indicated it would move up through the drainage system, and then through that drainage system, it would move towards the ditch, and once it gets to the ditch you have monitoring points, but that ditch is open to the ocean.

Now, if contaminated water gets in the ditch, and it was contaminated, how can you stop it from going to the ocean?

MR. SHOSKY: That's a very good question.

How would we stop -- and I believe we're all talking -- so that we all are on the same page as far

as talking points -- we're talking about at each one of these lateral locations, how would we stop water from just being discharged?

Our current thought on that, right now, is that these areas will be valved, and that we will have a -- and water will not be released to free flow without being trapped first and tested to determine whether or not it's clean, or dirty, and would require monitoring along these lines during the life of the project. That's our current thought on that right now.

So, there would be mechanisms to stop it. One of the earlier things we contemplated was a larger interceptor trench along this entire area here, but we felt that if we found contamination at that point, we would not be able to isolate it and treat it.

In this case, if we find the problem here, we can isolate it and treat it. If we find it here, we can isolate it and treat it.

So, we felt we had more control over isolation and treating, focusing our resources on a smaller source problem than a larger potential problem if not controlled properly.

DR. LAPIERRE: So, isolation and treatment would be pumping it and bringing it to your treatment plant?

MR. SHOSKY: Basically, yes. Or -- yes, that would be the treatment process.

MR. CHARLES: Mr. Shosky, can I ask you a question?

It's not about the water so much. Well, I guess, it is. It's about the channel.

This is a channel that has one side on the pond side with sheet piling and so on, and on the land side -- if I can refer it that way -- it's -- I walked the ponds yesterday, so I could get a look at this -- and on the land side, you're going to have some kind of rock against the side -- sort of a form on the other side of channel.

MR. SHOSKY: Yes, that's correct.

MR. CHARLES: Do you expect very much contamination to come from the landside into the channel? And I assume if you do, you expect it will be picked up further down with your monitoring, is that the ---

MR. SHOSKY: Let me make sure I understand -- let me make sure I can explain what you've just asked me to respond to.

What we're talking about is this side, on this side right now, correct?

MR. CHARLES: We're talking -- as I referred to the land side, rather than the pond side.

MR. SHOSKY: Right. Which for everybody, this is this side of the -- right now, we don't contemplate having a contamination problem coming from that part of the site into that channel.

I believe that there still is some -- I'm sorry, go ahead, Mr. Gillis.

MR. GILLIS: I'd just like to ask Mr. Potter to explain a little bit about what's going on on that side of the channel right now, from an historical perspective.

MR. POTTER: We do understand fairly well what is on that shoreline side.

The only area of concern would be at, what we would call, the former CN rail yards, up at the north -- right there, correct.

They do have on site contamination problems, but they are currently being addressed through remediation of their own project there. We would expect that that would continue to be monitored, and -- the only potential would be that there could be some hydrocarbons that could move into our ditch -- constructed ditch area, but we don't expect that's a problem, because it's a managed site already, and they would be ensuring that that didn't occur.

MR. CHARLES: So, when you say you know

what's going on, you understand what contaminants are there or potentially may be there.

MR. POTTER: We can firmly say that we know what is there.

We would have to prepare like any situation anywhere. There could be an occurrence that happened somewhere, a tank starts leaking and starts seeping into the brook, that can happen at any point in time from any location.

You know, there's appropriate procedures to respond to that, but for current conditions we understand what's along that shoreline and the only point of concern would be the CN property, which is managed, and we don't expect that to be a problem for us.

MR. CHARLES: But in any event you are going to monitor what's going down the channel anyhow.

MR. POTTER: That's correct.

MR. CHARLES: Thanks.

MR. SHOSKY: I believe that that concludes this portion unless the panel has any other questions at this point on that.

DR. LAPIERRE: I guess just for confirmation the deep aquifer groundwater is not a concern of yours, as you see it as not part of the project.

MR. SHOSKY: Let's go back to the previous slide.

In my professional opinion, I think we have monitoring capabilities here. The question of whether or not material will go from the Coke Ovens Sites, within any reasonable amount of time, to be -- travel down to this area could potentially be a very, very long time.

So, monitoring is available. Technically it's in the right place to catch a problem. If the problem ever gets that far within our lifetime that may be a bigger issue.

THE CHAIRPERSON: I just have two questions. One is clarification for me. It's the "T" part of the drainage system. At what level is that?

So, it intercepts as a "T", and it intercepts with the vertical, but not at the bottom. Somewhere closer to the top it intercepts. At what depth will that be?

MR. SHOSKY: It's more designed to capture shallow waters that would be coming from this portion of the adjacent properties.

THE CHAIRPERSON: Does it show up in your other diagram?

MR. SHOSKY: Not in the one that I got

presented now.

There's other diagrams that we have that we could show later if you desire to see that.

THE CHAIRPERSON: Well, if you would yes, or provide them. My second question is a possible request.

It's always great to see the real thing, and when Earth Tech did their solidification testing, have you still got that stuff? Is it hanging around in a bucket? And, if so, would it be possible to bring in some of those solidified samples, so that we could actually see the results?

MR. SHOSKY: Well, I don't ---

THE CHAIRPERSON: I mean, I don't want you to have to bring in, you know, a 10 x 10 x 10 ---

MR. SHOSKY: I'm not opposed to doing that. I'm -- if it's the sort of thing that you'd feel more comfortable with people touching and feeling and things like that. I can create new samples out of clean material and do that, if you'd like. I'm not sure if there's any of the moulds left, currently, since this was done last summer, that are still available.

Although, I could bring in some other samples of solidified material.

THE CHAIRPERSON: Well, I guess, the issue

is there's been a fair amount of description and a fair amount of questioning about the consistency of the monolith, and anything that you could, you know, being able to sit in front of you is worth a thousand words, and if there's anything that you could bring in that would give us a better sense of exactly what that consistency is, I think would be very helpful.

MR. SHOSKY: I'll check and see what the status of the samples were that we took during the summer, and see what I can do.

Or, as I said, if you'd like we could create some clean ones, so that people could actually touch it, but ---

THE CHAIRPERSON: Okay. Thank you very much.

MR. GILLIS: Just so that I am clear. So, we are undertaking to provide either the samples that were assessed or some pretty good facsimile of what would be there. Is that correct?

THE CHAIRPERSON: Well, I think they're undertaking to investigate the feasibility of either of those, or meeting my request in some manner and then come back.[u]

MR. GILLIS: Thank you.

MR. SHOSKY: Thank you.

MR. GILLIS: The next undertaking that we took was to provide an example of a similar project that involved containment waste in the saltwater environment in the same way of solidification and stabilization.

And, again, I'll ask Don Shosky to give a little bit of an explanation of some of the work that he's done in the past.

MR. SHOSKY: We have a couple of different items that we'd like to discuss with that right now.

And I think we'll start out with solidification in marine or saltwater -- saltwater type of environments, and there was really two components to that question.

One was, does salt/chlorine have an effect on the stability of cement matrix once it's been made.

And I got a study which was done by the U.S. Department of Energy, the Oakridge National Laboratories for cementitious stabilization of mixed waste with high salt loadings.

The purpose of that study and it was done in April of 1999, and I'll give you full reference on it once -- before the day's over -- the criteria for this study was is that there would be no free water. The average compressive strengths of the resulting material had to be greater than 500 psi, and the resulting

leachability test must fall within the U.S. standards for TCLP requirements.

Now, what's important about these high saline waste streams that come from radioactive materials is that the idea behind that is to come in a create a solution, a long-term solution, for a long-term problem.

As we know, the radioactivity material has much longer half life than a lot of the compounds that we looked at last Saturday with Dr. Magee.

So, the criteria was, no free water. Again, average compressive strengths greater than 500 psi, which we talked about earlier, is extremely strong. It's close to a quarter of the strength of sidewalk concrete, must fall within TCLP limits.

The conclusion was is that the cementitious waste forms can be used for final disposal with the salt brines at a loading rate of 50 percent by weight, which means 50 percent of the material that needs to be stabilized can be salt.

Our salt concentrations in this material that we have is .03 percent. So, we feel comfortable, based on this document -- and you're welcome to look through the document. It's an interesting document, and it leaves us with the conclusion that at .03 percent we should be well within safety boundaries of salt content,

considering the study that was done where the salt content was 50 percent of the weight of the material.

The other question that I'm prepared to answer today, that I needed to get clearance from one of my clients on, was that I do have an estuary case example that I personally worked.

It was a designed built project for a company called NiSource, and it was for a project, the Tauton Gasworks Site in Tauton, Massachusetts.

It's one that has gone through the state clean-up program, and there's a lot of information on that project, publically available.

The key points to this project were -- and, of course, it's on a lot smaller scale, so I'm in no way trying to indicate that it's at the same volume, level of magnitude that the Tar Ponds Project is, but the processing is the same. The capping material is slightly different, but the resulting situation was to create an engineered contained system that would have sustainability over time.

The project, itself, including sediment excavation of approximately 1300 cubic yards of material. A small volume compared to what we have at the Tar Ponds.

Sediment was stabilized using cement. That stabilized material then was placed into a tidally

influenced area. We did not have a lot of the extra liner materials that we do for the Tar Ponds Project.

We were relying on boundary controls, which we successfully installed at the project. We had additional treatment in place of tar pockets with cement. We put hydraulic controls, both upgradient and downgradient, using vinyl sheet pilings and slurry walls, which gave us complete hydraulic control, at the river.

We also did wetlands remediation restoration program as part of that effort, which required us to go in and remove coal tars out of a wetland area and go in and replace it with a totally restored wetland system.

We also constructed in this case a -- what we're calling a permeable cap, which meant that the capping material was only probably around 10 to the minus 5 centimetres per second, as opposed to 10 to the minus 6 or 7.

And the reason we did that was because that is the -- this is the project last week or Saturday that I talked about that was the one that was turned into a soccer field and park.

We went with a more permeable cap on it, because we were relying quite extensively on getting good vegetative growth there. For the soccer fields we also

did mass water calculations evapotranspiration models, which indicated that we would not have any detrimental effects by increased infiltration of water into this system.

The site is monitored right now, as part of the program, and was turned over -- I believe it's been turned over to the City of Tauton for long-term management, as a park and recreation facility for soccer, and that indeed is what the final usage was for that facility.

I'm happy to -- the only request my client made is that they didn't want a lot of extra calls, but certainly if a panel member would like to call them for a reference that would be fine. But they prefer not to have names and phone numbers given off in this type of forum and a lot of questions called to individuals.

DR. LAPIERRE: Thank you very much for the information.

I would like to ask a question on the salinity.

You indicated that your salinity was .03 ---

MR. SHOSKY: Yes.

DR. LAPIERRE: --- at the present time.

MR. SHOSKY: That's ---

DR. LAPIERRE: That's present time.

MR. SHOSKY: Yes.

DR. LAPIERRE: That includes the freshwater, saltwater mixing.

MR. SHOSKY: That's correct.

DR. LAPIERRE: Now, once you put the monolith in place and you control the flow of freshwater from the monolith, you may have some coming from other sources, but it should be diminished.

The primary source of water under the monolith could be saltwater.

Is that correct?

MR. SHOSKY: That's correct.

DR. LAPIERRE: Now, would that have the same salinity of .03 when you exclude the freshwater from it?

MR. SHOSKY: Just one moment. I'm sorry, we expect that the salt content would still be somewhere in the range between 3 and 5 percent, and that the monolith would still withhold those types of salinity changes.

DR. LAPIERRE: So then you expect a significant quantity of fresh water to still penetrate below the monolith, because salt water should be higher than 3 or 5 percent if it was only salt water.

MR. SHOSKY: If it was only salt water, it would be whatever the concentration of the salt water would be, and I'm not sure what that is off the top of my head, I'm sorry. But I think it still would be below the 50 percent criteria that was set forth in that DOE study.

MR. CHARLES: Mr. Shosky, I'm just not quite clear about the type of cement that you were using. You mentioned the Oakridge cement with the 500 psi strength, but in your client's situation were they using cement that strong, or was it a specially adapted cement to deal with salt water, and would it be the same as you'd be using here?

MR. SHOSKY: It was normal Portland cement. It was not an add-mix mixture of any specialty products.

MR. CHARLES: And it would be somewhat similar to what you're going to be using, I take it.

MR. SHOSKY: That is correct. And off the top of my head I don't remember what our compressive strengths were there but they were -- should have been in the same order of magnitude as what we're proposing for the Tar Ponds.

MR. CHARLES: Okay. I just wanted to be sure that it wasn't a special cement that had been, you know, treated in some way to deal particularly with salt

water.

MR. SHOSKY: No, there was no special additives added to it.

MR. CHARLES: Thank you very much.

MR. GILLIS: The final undertaking that we're going to talk about relates to providing a report indicating or providing information regarding the most efficient rail method to transport the waste to the incinerator, and again I'll ask Don Shosky to talk about that.

MR. SHOSKY: This was in response to the question that was asked on Saturday about the use of flat cars, and, as I said on Saturday, we've been in the process of re-evaluating this for the last couple of weeks. We had a number of comments from the independent engineer on that, as well, and basically I thought I'd go through the process so that everybody understands the issue over rail traffic, and then I'll give the short response.

Basically, sediments will be excavated. They'll be transported to a staging area. That staging area they'll be further de-watered, and that would be primarily with clean treated soil. We will use a couple hundred tonnes of fly ash at the very beginning of the process to dry out the soils. Those will be taken up

from the staging area to the thermal treatment area, and the process that we were going to use on that originally looked like we were going to used sealed individual containers, of very small volume, which would have had to have been put on a rail car and placed up there.

We've been looking at this for, like I said, the last few weeks, in particular, and have decided that more direct loading into more traditional type of rail cars is much more beneficial, not only from a material handling standpoint but also from the number of rail cars that need to go up and down the tracks. Now, we suspect that the number of rail cars that would go up and down will be dropped significantly once this change is implemented into the process. So the evaluation that was done earlier would be more conservative than -- one that was presented in the EIS, than possibly what will happen during the implementation programme.

Once the rail cars -- of course, they'll be sealed and watertight both on top and in the bottom, they would be taken up to the offloading area for the incinerator and be placed in a covered area. And the reason that it's being placed in a covered area is not necessarily because it has odours, but because we want to keep the material as dry as possible at this point as it's being prepared as a feed stock for the incinerator.

Once the materials are treated, they would be tested after treatment every 1000 tonnes of material, and then they would be shipped back down the -- back down to the Tar Ponds site where they would be stabilized again in order to maintain the consistency of the monolith and placed back into the Tar Ponds cell under the protective cover and in the contained system that I described earlier.

We intend to do rail shipping primarily during the warmer months, probably five or six months out of the year, and the storage facility that we have up near the incinerator is designed to accommodate burning for the additional six months that the rail traffic will not go up there, and that's to prohibit the issue of the freezing of materials in the rail car, because that can be quite a bit of a problem unloading frozen rail car material.

So there will be stockpiling of material and all of the excavation and dredging activities and de-watering activities will come through a particular point in time of the year. It will not go all the time, all seasons, but the thermal treatment will go all year 24-hours a day, 7 days a week.

MR. CHARLES: Before you get on to your short answer, how many cars would you be thinking about?

In the original EIS it was 38 to 40 cars once a day, as I recall. Are you going to be able to reduce the number of cars drastically, cut it in half?

MR. SHOSKY: Yes, it will be drastically reduced. Because the volume of material we can hold in these rail cars is so much more, it should be less than -- probably about a third of that amount of traffic.

MR. CHARLES: And I guess we'll get to this at some later point, but obviously if you have heavy cars, you know, loaded with material, the rail bed that you're using has to be adequate to the task, and I assume that that's something that will be looked at, as well.

MR. SHOSKY: We are currently in the process of looking into that. As part of the pre-design effort it wasn't specifically laid out as an item, but it will be something that will have to be looked at in the detailed design, you're correct.

MR. CHARLES: Thank you.

THE CHAIRPERSON: Could I just ask a point of clarification. So are you saying that the de-watering will now be carried out mainly by adding in dry soil so the -- will there be other methods of de-watering used?

MR. SHOSKY: The methods that we're looking at for de-watering right now are primarily gravity draining and addition of clean soils. There may

be -- we're not planning any other mechanical processes at this point in time.

THE CHAIRPERSON: And how long will the sediments drain, how long will they be sitting there on average with the gravity drainage taking place?

MR. SHOSKY: I would suspect that it would be only for a day or two, and primarily in the area of the Tar Pond cell itself.

THE CHAIRPERSON: And the addition of the clean treated soil, that's the same as -- you've always been saying you were going to do that, that basically you were going to add the same volume or same weight. That is that process and it will be happening at the Tar Ponds site before you ship it.

MR. SHOSKY: The short answer is yes. The longer answer is is that a feed stock criteria has been set that dictates moisture content, BTU value and a few other items that are critical to ensuring the success of the operation of the incinerator. So sometimes we may, in order to reach that requirement, add a little bit more or a little bit less of the clean soil in order to meet that feed stock requirement.

THE CHAIRPERSON: Okay. Thank you. That was the last of your four undertakings, is that right?

MR. GILLIS: That's correct, yes.

THE CHAIRPERSON: And did you have any points -- you've done your points of clarification, and that leaves on our side two questions that were deferred on Saturday.

I'm going to ask Dr. LaPierre to maybe just run over those two questions again, all right?

DR. LAPIERRE: Thank you.

One of the questions referred to the succession at -- the ecological succession comments in the EIS and I had asked a question on the ecological succession that resulted from our discussions on the integrity of the cap and its ability to support. I mean, the comment indicated ecological succession. My limited knowledge of ecological succession in this area would be that you wouldn't have gas forever, and I guess I was kind of anxious to understand that comment.

MR. GILLIS: Yeah, I'm first of all going to ask Shawn Duncan to clarify that, and then we can ---

MR. DUNCAN: Thanks, Mr. Gillis.

Yes, in reference to the response we were talking about on Saturday, we were talking about the site and maintenance of the site, and long-term management of, I guess, vegetation in the overall site. There were also areas that are going to be designated as habitat requirements for, you know, specific areas during the

remediation.

Overall, the site wouldn't have to be managed from a vegetation perspective until final end use is designated for it that contemplates those long-term vegetation management practices, but for the purposes of successional species and re-establishment of those species in the long term, perhaps I could have Dr. Stephenson speak to the timeframe associated if the site was allowed to just regenerate over time without any sort of management of that site.

DR. LAPIERRE: I guess my question was more that -- to the statement that in 15 to 20 years this would revert to a natural succession.

MR. DUNCAN: Again just maybe I'm not being clear in my response, obviously I'm not, but what we'd like to do is we can comment on that.

The site itself will have, I guess, vegetation management associated to ensure that those type of integrity questions or issues that we talked about on Saturday are managed in the long-term management of the site. If the site was allowed to, I guess, proceed in an unmanaged fashion or an uncontrolled fashion you would get that type of revegetation and re-establishment of those types of species that would establish over the long term.

DR. LAPIERRE: So it would be more a managed succession than a natural succession.

MR. DUNCAN: That's correct, unless it was deemed as a final end use to be allowed to go back to a natural state, in which case we would have to -- similar as you would with other final end uses, you'd have to design the final features of the site to accommodate those types of end uses.

If there was a natural vegetative site similar to a park or a golf course, as Mr. Potter described on Saturday, you'd have to account for those in the final -- the design of the final site itself.

Dr. Stephenson is available if there are specific questions about the successional nature of certain species or revegetation if you'd like a response to that.

DR. LAPIERRE: No, I don't have any specific, I was just surprised by the comment, that's all.

MR. DUNCAN: Hopefully that -- did that clarify?

DR. LAPIERRE: It does, but I wouldn't call it natural succession.

The other question, I guess, related to the fishway and I guess the answer was that -- and I just

want to be certain -- the fishway design had not calculated the bio-energetics of -- that bio-energetics of fish had not been calculated in the flow rates associated with the channel.

MR. GILLIS: I don't think -- first of all, I'm not aware that the thing's been finalized. I don't think the design has been finalized, but there's no question that you'd have to understand the energetics of the fish, the size of the fish, and the burst swim speed and various other components that go into any design of a channel.

I believe the concern that you mentioned the other day was with respect to the combination of flood conveyance as well as the ability of fish habitat to maintain itself in the middle.

If you go back to kind of the natural stream cross sections we have in this temperate climate, where you have the very high rates in the spring and much lower rates in the fall, you tend to get an inverted trapezoidal cross section of your stream with a habitat flow over a stream section in the middle which basically flows through, and I would suspect that this is the kind of design we'll end up with here, so that you will have a low-flow condition capable of carrying fish as well as the trapezoidal situation capable of conveying higher

flows of water, very much similar to the natural thing you have in streams in this area.

THE CHAIRPERSON: I've got two questions. I'm going to ask something about the second question first just so that you can get prepared, if you need to, because we have a question which it would be very helpful if you could put up one of the -- find and put up on the screen one of the figures that you sent us, and it was as part of IR-53, and it was the -- the title of the figure is "Tar Ponds Layout of Soil Treatment Cells." So I'm just -- perhaps somebody could find that and get ready and I'll go ahead and ask my first question, and then we can come back to that.

The first question is really yet another follow-up to a question that we originally asked in IR-12 regarding the mass of PCBs. So we've been interested and are still interested in getting the very clear and simple, if possible, please, sense of what is the total mass of PCBs in the north and south ponds. When you came back with your information, or we asked this question very specifically in our follow-up request, and you provided us with lots of information, but your information was drawn from a table that you provided in which you provided the mass of PCBs in different sections of the north and south ponds that had been delineated as

having concentrations of over 50 ppm.

So this isn't quite the -- it was very helpful to have that, but it isn't -- we also additionally would like to know the total mass of PCBs in the north pond and the total mass of the PCBs in the south pond, as best you can estimate that from your sampling, and then, just so that we -- you provided us with a removal percentage of the PCBs in those areas that are over 50 ppm, and you've indicated that the project will remove 89 percent of those PCBs leaving 11 percent.

We would just like to know what the overall figure is that the project will remove, what percentage of the total mass of PCBs in the whole of the north and south ponds. Is that something that you have to take as an undertaking or are you able to answer it directly?

MR. GILLIS: If you could just give us a moment again to turn up the IR.

THE CHAIRPERSON: Would it help if I -- the original IR was IR-12. I guess it was IR -- no, it was a follow-up to IR-12, sorry. I got myself confused.

MR. GILLIS: My understanding of the response to IR-12, we have an answer here:

"The mass of PCBs to remove from the north and south ponds is 3286 kgs or

approximately 89 percent total of the PCBs that are present there."

I may have misunderstood, but I -- I guess I did misunderstand.

THE CHAIRPERSON: Well, maybe we've misunderstood but let's see if we can come to a mutual understanding here.

Your table, Table IR-12, the title of that is -- maybe we misunderstood this, but the title is "The Mass Volume..." -- you've given us both information -- "... of PCB Contaminated Sediments Greater than 50 ppm Within Each Unit." Is that the same -- that's not the same as the total mass of PCBs. And the figures that you provided that told us that you're going to remove -- well I presume that doesn't change, the amount you're going to remove, and I guess what we're asking is once you've taken out the 3695 kgs of PCBs from the north and south ponds, what will be left, in total, in the north and south ponds, whether or not it's residing in an area that's over 50 ppm or an area that's under 50 ppm?

MR. GILLIS: You are quite correct, we gave you a number related to the percentage of PCBs with a concentration greater than 50 ppm, and we will take an undertaking, if you wouldn't mind, to provide you with the total number.[u]

THE CHAIRPERSON: Thank you very much.

MR. GILLIS: You're welcome.

THE CHAIRPERSON: And then the second question which relates to that figure, if you've been able to find it and put it up, really in a general sense it would be very helpful if you could walk us through the excavation process.

Now, in the EIS in Volume 1 you have a fairly simple description, and it's talking about sheet piling and cells. So then this appeared in reply to IR-53 and we're not quite sure if we know what's going on. So perhaps you could walk us through this diagram and walk us through the process. Are you still using containment cells within those areas? What do those areas really represent? And so on.

MR. GILLIS: So, just so that I'm clear on your question, you'd like to understand how we're going to get at this material, how we're going to remove it, what size of the cells we're going to use, those kinds of questions, is that about right?

THE CHAIRPERSON: Yes, that is, and I think we would have asked for extra information anyway but when we saw this diagram it was kind of "Hmm, right, this is..." -- we found this a little hard to interpret.

MR. GILLIS: First of all, I should

preface this by the detailed design is not yet going forward but we've got a pretty good handle on the design concept so we're going to be applying.

So what I'll do is I'll ask Don Shosky to get up and perhaps he can refer to this figure and then refer to the subsequent figures that may give a more, perhaps, accurate depiction of where our thinking is right now.

THE CHAIRPERSON: And if you can read the legend out because I can't read the legend from here and nobody would stand a chance out there.

MR. SHOSKY: Thank you.

I'll walk though what our process is that we're discussing currently as far as the progress of pre-design. A little bit of definition of areas, the brown coloured areas here and here are the PCB areas to be removed. The green areas are -- and the blue areas -- are areas to be stabilized. The white area here, open channel conditions. And I'll explain sequentially what we anticipate happening.

Once the channel's been constructed, what we're looking at now is you'll remember that we talked about having sheet piling along this location here which would be the Tar Ponds side of the area to be stabilized.

The first problem you encounter with these

sorts of situations is being able to create a large area, or a large enough area, that's capable of conducting the stabilization activities.

So assuming that we start down here in the southern arm, and work our way towards the ocean, what we would do is basically install two series of sheet pile walls which is the blue area here. On either side of that blue line are sheet pile walls. Why are we doing that? We're doing that so that we minimize the amount of water that's infiltrated into this area that we're getting ready to stabilize.

So the concept is right now to first de-water the water that's in this area by pumping the water over into the next adjacent cell that's been created, and once it's dry begin the excavation process of taking those sediments out, letting them gravity drain, adding this -- and placing the cement into that material in situ. So as we move the material to start stabilizing it in place, which we'll use hydraulic excavation equipment or traditional civil construction equipment, it will gravity drain those areas to get the excess water out, and then the cement would be added as necessary to create the monolith.

THE CHAIRPERSON: I'm sorry, I'm confused here. You're in an area with no PCB sediments, you don't

have to excavate anything.

MR. SHOSKY: When I talk about excavation, what I mean is that you have to move the material a little bit in order to get it to dry out a bit before you go ahead and put your cement into it.

THE CHAIRPERSON: So it isn't a situation where you have the sediments, you're de-watering, they're just sitting there, you're coming in with your auger and -- you're actually moving that within the area, okay.

MR. SHOSKY: We're not proposing an auger system at this point. There has been a lot more stabilization done with these shallow systems using traditional civil construction equipment than the use of the auger systems.

THE CHAIRPERSON: Yes, I'm sorry, I did know that, I'd forgotten.

MR. SHOSKY: Go ahead, Greg.

MR. GILLIS: Two things that helped make the penny drop for me, was to understand, number one, it's in the dry as much as possible, we're de-watering a whole lot. And the second thing is working in areas about the size of a soccer field, as I used in the presentation yesterday. So if that helps.

MR. SHOSKY: The other item that is important to note here is that all the mitigation

controls that we talked about yesterday, not yesterday but Saturday, the air monitoring, the dust control, the odour control, all those control mechanisms will be in place during the stabilization process.

So once this cell has been completed, then we would continue to move in a similar fashion throughout.

DR. LAPIERRE: Can we ask a question?

MR. SHOSKY: Yes.

DR. LAPIERRE: Can we get the -- once you've finished a cell, are you going to remove that sheet pile? Or are you going to leave it there? If not, you're not going to have one solid monolith, you're going to have a monolith and various sizes of monolith.

MR. SHOSKY: Well, the idea is is as we move we can do one of two things. We can either leave the sheet piling in place or remove it, and tie the next adjacent stabilization piece in with it. For example, when we got to this point here, we may decide to take the sheet piling out and mix our monolith right next to the stabilized material in blue that's right next to it.

So the idea would be to come up with a sequencing plan, and this will be part of the detailed design, where the two are married together so that there are no issues of a void space crumbling, things of that

nature.

DR. LAPIERRE: So the sheet piling wouldn't stay, because couldn't it be a source of corrosion?

MR. GILLIS: It could be a source of corrosion, but in -- the area of concern for the corrosion would be this area here, except that we have safeguarded that area with the armouring system that I described earlier this afternoon with the HTPE liner, the rock riprap material and the liner material that ties into that sheet piling.

Now, if it's okay with the panel, I'll go ahead.

The PCB areas in the darker colour, the brown, would be handled a little bit differently. That material, again, would be removed, and stockpiled and run through the conditioning process, the de-watering and conditioning process that I discussed during the rail car discussion that we had. So that material would be again the water pumped off the top. In this case, the water, once it gets pumped down to a certain level would be put through a treatment plant to ensure that there were no PCBs or other contaminants going into an adjacent clean cell. So the water would be treated using carbon filtration -- oil/water separation and carbon filtration.

Now, the one thing I did explain when we talked about the rail car movement was is this material, once it gets dried and prepared as a feed stock and sent up to the incinerator, it's going to come back down again. In order to maintain the integrity of the monolith, this material will then again be treated with cement prior to putting back into the cell. The reason that we decided to do that was because we wanted a continuous monolith, the type of material there, we did not want to return clean soil that was of a different hydraulic conductivity that could provide a pathway for materials to come in contact with our monolith. So we strategically decided to go ahead and stabilize all materials coming back from the incinerator in order to make up the remainder of this monolithic fill.

Where that becomes more critical and more important is up in this area here, so that it, in turn, makes the entire area a consistent monolithic fill at the end. And that's the brief version of the diagram.

THE CHAIRPERSON: Thank you.

And then you put your vertical drains in by what method?

MR. SHOSKY: We would use traditional excavation equipment. Some of it may be sequenced as the cell itself is being built. That aspect of it has not

been fully developed yet through the pre-design phase. That's a detailed design item.

THE CHAIRPERSON: So you would be removing solidified material.

MR. SHOSKY: Potentially.

THE CHAIRPERSON: And then that would be ---

MR. SHOSKY: We would have some additional water added to it, and then we would then put it as part of the final grading plan, so that our final grading plan, at the end of the day we have a grading plan -- you'll remember Saturday we talked a little bit about why we had different thicknesses of clay fill material as part of our cap. Once we create the monolith, we'll see that we have less than 1 percent slope going back towards the channel in these locations, so that land will actually tie in nicely with the adjacent properties. And, in order to compensate for the fill differentials, that we discussed on Saturday, this is kind of what the final grading plan will look like. Of course, more detail in the detailed design will have to be accomplished before that's done, but this gives you a sense of what we expect it to look like at the end.

DR. LAPIERRE: One question. I was -- I don't know if I understood correctly but whence you put

these one-meter bore holes that you're going to put into that monolith, did you just say that you could just take the cement that you're going to excavate or bore and add water to it and then reapply it?

MR. SHOSKY: Some of it can be rehydrated in some places for your final grading application. We have to remember that this material acts more like a clay product as opposed to any type of dry crumbly type of material, so it's got a lot of plasticity to it typically so that it can be rehydrated often, re-compacted and re-compressed. We have -- I've done this a number of times at a number of different capping situations. You have to have very stringent quality control mechanisms in place and a very diligent sampling programme and compaction testing programme to ensure that materials are placed properly at the end of the project before capping.

DR. LAPIERRE: Okay. So I guess the problem I have, if this floats on water, the water table's right there, what would stop it from slurrying in at the base, if you can re-slurry it on top?

MR. SHOSKY: It will have set up to a point where it won't do that. Based on my experience, that's typically what happens, we'll have a good curing time so that the materials set up. It will be very difficult to remove out of there and, as I said earlier,

some of these details have not been fully developed yet because we're in the pre-design stage. It is -- you are capable of doing it in sections as well, and basically shoring up that trench situation with forming of the sediments with concrete for the interceptor trenches, which would allow them to stay open and alleviate the concern that you've raised.

So there's a number of different construction techniques that can be used. The real issue is is that it hasn't been dived into that level of detail at this point because it's still in the pre-design stage. However, I feel very confident that there's two or three different construction techniques that could be used to install those interceptor trenches.

THE CHAIRPERSON: And just one more question.

MR. SHOSKY: Okay.

THE CHAIRPERSON: It's just pertaining to the north pond area of contaminated sediments, absolutely no way that you could take the cleaner sediments off separately? You referred to the fact that you're going to send everything -- from that diagram you're going to take ---

MR. SHOSKY: That's why I haven't put the previous diagram up.

THE CHAIRPERSON: From that diagram the plan is to excavate all of the sediments within that top block.

MR. SHOSKY: That is correct.

THE CHAIRPERSON: And you've explained in the EIS that the overlying sediments will be -- will go to the incinerator, as well.

MR. SHOSKY: That is correct.

THE CHAIRPERSON: And you've investigated any possibility of actually separating those, there's just simply no way to do that cleanly?

MR. SHOSKY: Well, there is a way to do that cleanly. The trade-off is the length of time and energies expended and the possibility that the project could even drag on a little bit longer by not going through and just taking the whole lot of it up and burning it. But it would be possible to stage and segregate different materials. There'd be more material handling, more dust control. There'd be different evaluation of risk factors that would have a larger open area that would be more exposed to some other item that we would need to go in and further investigate from a risk perspective.

THE CHAIRPERSON: Thank you.

DR. LAPIERRE: I'd like to ask a question

which relates to the sheet piling on the Coke Oven site. You're going to sheet pile -- I guess the diagram that you have here shows -- that blue line is sheet pile on both sides, is that correct?

MR. SHOSKY: Yes.

DR. LAPIERRE: And the upper part, which faces the landfill, doesn't have any.

MR. SHOSKY: That is correct. There is no sheet piling here.

DR. LAPIERRE: Okay. That sheet piling goes to a hard till.

MR. SHOSKY: That is correct.

DR. LAPIERRE: And I guess two questions. The first one relates to when the water table meets that sheet piling, and that sheet piling will be normal sheet piling, metal piling, would it be protected, would it be coated with clay so the permeability -- you have a permeability that you'd accept for the sheet piling?

MR. SHOSKY: Yes. It would have to have the interlocking systems that are waterproof.

DR. LAPIERRE: Okay. Do you anticipate any back pressure in the groundwater table, particularly in spring time, for example, to develop there, against that sheet piling?

MR. SHOSKY: That's a very good question.

Our modelling has not gone to that level of detail through the pre-design phase. My personal opinion is is that you would potentially have some water that would back up behind the sheet piling, possibly seasonally, but would be absorbed within the rest of the aquifer conditions not causing a problem over the course of the year. I believe that that mounding that would occur would recede over a reasonable amount of time.

DR. LAPIERRE: I guess, my concern would be that during that time if you haven't modelled, as you proceed with your design you may model it, because there are two streets on both sides where people live. I guess there's few people who live on Frederick Street but there are some on the other side.

And would -- my second question was really, if you've modelled it, does the pressure build back to those levels and could you have hydraulic conductivity pressures through basements, for example?

MR. SHOSKY: Well, I'm not sure that the mounding would go back into any of the residential neighbourhoods, just given my knowledge of the area. And, as I said earlier, there's a number of different ways that we can approach this, as well. At this point in time, our current thoughts are with sheet pile walls. If it looked like any sort of mounding could be a

problem, we could use other control mechanisms with walls and drains or something of that nature in order to transmit the water faster. But what I've seen so far in my evaluation of the information is that I don't expect that we would see mounding occur once those control structures are in place, certainly not into any of the residential neighbourhoods.

DR. LAPIERRE: A second series of questions relates to the groundwater. Now you're going to pump the groundwater from within the coke oven areas. That's correct. And the question I have, according to your risk assessment, it seems that there's no risks other than to the workers from that groundwater. So then why would you pump it.

MR. GILLIS: All right. Dr. Magee, could you answer that and just verify that workers would be the only people at risk.

DR. MAGEE: Well, yes, but remember that the risk assessment is evaluating the risks associated with the remedial activities not the baseline risks so I'll defer to Mr. Potter concerning the nature of the project and how it was designed.

MR. GILLIS: Could you just give us a moment please.

MR. POTTER: I guess the question, the

response to the question relates to the fact that this, what we're designing is a managed site. Dr. Magee addressed the risk to the workers but the intention of collecting the water at the bottom of the coke oven site was to pump it up and test it and treat it with the anticipation that there -- we expect because there is contamination down there that we'll have to treat it and that's the basis for the engineer containment system is pump the water up, treat it till we get it to a point where it's clean and can be discharged.

DR. LAPIERRE: Would you have any SSTL's identified as to what you would quantify as clean water?

MR. POTTER: Yeah, we do identify in the EIS that we would meet appropriate Fisheries discharge criteria for the streams.

DR. LAPIERRE: So you could -- you would pump and treat till you reach a quality that you could send directly to a fish habitat?

MR. POTTER: Correct. The SSTL's don't come into play in that. It's simply meet the Fishery criteria.

DR. LAPIERRE: Okay.

THE CHAIR: I think that as Mr. Charles has a series of questions that he wants to ask but rather than begin those right now, I'm going to suggest that we

do take a break. Thank you very much for your answers and presentations. It is almost 2:30 and we'll resume at ten minutes to three.

--- Upon recessing at 2:28 p.m.

--- Upon resuming at 2:55 p.m.

THE CHAIRPERSON: I would like to resume the session please. And we'll start off, Mr. Charles has some questions.

MR. GILLIS: Madame Chair, if I could ask just one clarification.

THE CHAIRPERSON: Yes.

MR. GILLIS: Just to clarify in the previous discussion before the break, there are no off site risks been identified. All the risks were on site risks that we were -- we'll be dealing with. There'll be no risks to any of the neighbouring properties near the coke oven site. I just wanted to clarify that point. That was the basis for the MOA that the project is identified that we're dealing with the project activities on the site. There's no -- bottom line, no off site risks because of the groundwater.

DR. LAPIERRE: But the question I had asked previously was, if you've got back pressure built up against your sheet pile, can it run off your property? And the answer I got was that you hadn't calculated that

back pressure but that you might have some.

MR. GILLIS: Yes, I had indicated that we had not calculated those numbers but it was in my professional opinion that it wouldn't back up as far as the neighbourhood, just based on my knowledge of the hydrogeology but we'd still need to quantify that.

DR. LAPIERRE:: So you will quantify it?

MR. GILLIS: As part of the detail design process it would be quantified.

DR. LAPIERRE: Thank you.

MR. POTTER: And the water being backed up is clean water from off the site. All the water does come to the site. The purpose of the barrier is to prevent -- you know, reduce the water coming onto our site. The backing up question has to be addressed but it's backing up of clean off-site water.

DR. LAPIERRE: I understand that.

MR. POTTER: Great. Thank you.

MR. CHARLES: I have some questions about the incinerator but before we get to that, I'd just like to explain why I am moving my chair backwards from time to time. Right directly over my head we have an air conditioning unit that's pumping very cool air down right on top of me. And my particular matrix doesn't have a cap on it so I'm somewhat unprotected and sensitive. So

I hope you don't mind if I try to get out of the way of this thing every now and then.

The first questions that I have relate to the siting choice for the incinerator. I -- from reading the EIS it was clear that there were two possibilities, the Phalen Mine site and the Victoria Junction site. And through an elaborate evaluation system which is included in Appendix E, I think it is, in the EIS. The results finally came out that the Victoria Junction site was two points better than the Phalen site.

And I guess what struck me when I read throughout the detail of the evaluation was that the Phalen site seemed to score about four points better in the first two categories, which were public health and safety and environmental impact, in the VJ or the Victoria Junction site scored better in socio-economic and economic and financial categories which included transportation.

And I guess my question is is it fair to say that the socio-economic factors somehow overcame or outweighed the public health and health and environmental impact factors and I guess I was asking myself this question, because of a response that the Proponents had given to a public comment, that's PCO 5.2. And I can read you at least part of your response. And I might

just ask for clarification about part of it. You responded to this public comment about the evaluations by saying:

> "In Figure 6.2 of Volume II the larger air shed of the Victoria Junction site appears to have more potential receptors as represented by built up areas depicted in red on the map base than does the Phalen site. From accumulative air quality effect perspective the VJ site therefore may seem less suitable than Phalen. But this larger scale issue must also take into account that the transport between the VJ site and the tar ponds and coke ovens would be more efficient."

And I take it that means it would be cheaper but I could be wrong on that. This is -- due to the shorter distance -- this is considered to compensate for any higher accumulative effects that might be experienced around the VJ Site. And I'd just like to have somebody maybe clarify that, particularly that last statement in terms of exactly what it means in terms of compensating for higher accumulative effects. Is it

saying that the socio-economic factors are somehow translated or transported and have an effect on the accumulative effects of the air shed?

MR. GILLIS: The siting exercise was just that, to get a relative ranking of the potential sites. What we wanted to make sure happened in the conduct of this exercise is that we had sufficient options available to us in the event that we ran into something that was problematic.

The important thing to consider here is that both the Phalen site and the VJ site underwent a pretty stringent human health risk assessment as well as -- which included the output from the air modelling exercise. So the siting criteria got us through a particular level and got us through a particular decision point including the economic, socio-economics and all those evaluations. Then we went into a second level or if -- to make sure through the detailed human health risk assessment and the other risk assessments that were conducted on this -- with respect to this site and the operational facility at the site. To ensure that it was health protective and it was well below criteria for any human health risks. And perhaps I can ask Shawn to expand on that a bit.

MR. DUNCAN: Thanks, Mr. Gillis. Yeah,

I'll hopefully provide some clarification here. The response that you read was in reference to the two sites and the cumulative effects associated with the on site activities and the relative distance of those sites to the on site activities. What is perceived I guess on a higher level is that the further the site is away from the on site activities you wouldn't get that overlapping cumulative effect.

But what you would end up with is additional materials handling and additional transportation issues associated with taking it further. So there are offsetting issues associated with the distance in the sense that you'd get less of those type of emissions by having a site closer to the on site activities. So even though intuitively you might think that they're overlapping and you'd have more potential for that, and in fact it's probably a bit of a loss because you've got those other factors that are coming into play as well.

MR. CHARLES: If I can just follow up on that. The evaluation as one of its points asked the question, do both sites have access to rail and to road, trucking purposes. Since the decision has been made to transport all the material by railroad, does that have any effect on the impact of this distance and the

distance you have to transport your materials because it seems to me if you have one train load a day with "X" number of cars going ten miles rather than 20 miles, the difference is not very great.

MR. DUNCAN: You're right. I mean, there aren't large differences and I think I was speaking more to the issue of the perception or even intuitively think of sites -- because the site is closer you would have potential for overlaps in a cumulative fashion. In reality what we found is that the sites are far enough away you don't get those type of overlaps anyway with VJ. So intuitively you think it's closer it's got to be worse. But in reality it doesn't really matter from a cumulative perspective, the overall distance.

MR. CHARLES: Well, since the two sites are so close, just two points apart, was there any one factor that tipped it, the evaluation in favour of the VJ site rather than the Phalen site?

MR. DUNCAN: I think -- well, we evaluated both sites. We had -- just to back up a little bit, with the siting criteria, we did a desktop screening exercise to look at a number of potential sites and locations. We ranked those sites accordingly and weighted them and gave them a scoring system to kind of weight the sites and rank them according to those scoring. The two top sites,

Phalen and VJ were selected by a proponent to carry forward in the EIS as being economically and technically feasible from their project. So those two sites we carried forward in the assessment and performed full human health and ecological risk assessments for the operation, construction operation of the incinerator facilities on both those sites.

The preferred site was VJ because I -- probably the major consideration was the shorter distance. You have easier logistics, there's probably less site preparation required at VJ over Phalen. So there are a number of logistics and cost issues associated with VJ being the preferred site. If -- I'm not sure if the STPA even wants to respond more to that but that's my understanding for the selection of that as being the preferred site.

MR. POTTER: Just to add slightly to that, you made the reference to all material going by rail. It won't be all by rail. I think we were clearing that on Saturday that the bulk of the material will go by rail but there will be trucking as well for some material coming back, other supplies, services coming in. So getting to the Phalen site would be much more significant in terms of, you know, the -- some of the community roads they'd be travelling through.

MR. CHARLES: Yeah, I agree with that. I just -- I meant that all the material going to the incinerator coming -- had been treated and dewatered and so on would be going by rail. I guess there's one other factor at the Phalen site that you have some mine subsidence there that was taken into account as a negative factor in that site. Is that a big problem? I don't know the underground area there but would it pose some real problems for the incinerator set up?

MR. DUNCAN: Certainly some of the geotechnical requirements to the incinerator would have to be accounted for during the construction and set up of the incinerator facilities. The -- one of the issues, if you go to the siting study is the number of sites that were identified were DEVCO properties and associated with any of those types of properties is the potential for underground workings. And those -- now -- and my understanding from speaking to the folks at DEVCO is that they've mapped -- gone through extensive efforts to identify all those potential underground workings but certainly from a geotechnical perspective for siting an incinerator you'd have to certainly investigate that much more fully before you'd put an incinerator on top of those types of underground workings.

MR. CHARLES: Okay, thank you. The next

series of questions has to do with a response by the Proponent to the panel. And I think it's in IR-41 where we ask for information about other incinerator activities primarily in Canada but it could be anyhere. And you've provided us with a list of several sites with information about each of them. And in the table that you presented there's the more detailed information but the sites that you referred to were Swan Hills, Ste. Ambroise, Quebec, Belledune, New Brunswick, Rose Disposal Pit, Superfund, Massachusetts and Bridgeport Refinery. I noticed that in the EIS at page 2-47, there was reference to incinerator operations at Smith Falls, Ontario and GooseBay, Labrador. I'm just wondering why they weren't included in the list that was given to us.

MR. GILLIS: The response primarily is to do with the timing. The ones that are listed there are more -- far more current, it's my understanding. Don, if you'd like to correct me on that.

MR. SHOSKY: You're correct, Mr. Gillis.

MR. CHARLES: I'm sorry, the explanation was what. I didn't quite get it?

MR. GILLIS: One with respect to how many years ago they were in operation.

MR. CHARLES: Oh, I see.

MR. GILLIS: Yes, we wanted the ones that

were most current.

MR. CHARLES: The most current.

MR. GILLIS: That's correct.

MR. CHARLES: How long ago were the other two in operation, do you know?

MR. GILLIS: The Smith mill was about 25 years ago, 20 to 25 years ago. And Goose Bay was 15 to 20 years ago.

MR. CHARLES: So your reasoning I suppose would be that the technology has advanced since those times and that the performance statistics from those incinerators might not be as good as you would get from modern incinerators.

MR. GILLIS: We just wanted current information. That's about it. The information that I have based on the operation of the other two facilities is pretty solid from the information that I was able to review or know about but we wanted fairly current information in here.

MR. CHARLES: The reason I was wondering is because it was mentioned earlier in the EIS so I guess it was current enough to be mentioned there. The list that you gave us, am I correct in assuming that there's really only one site that deals with contaminated lagoon sediments? The others are all general waste or dry

sediments, primarily.

MR. GILLIS: I'll ask Don Shosky to comment on the nature of the materials that are being incinerated and brought to the plant.

MR. SHOSKY: The Swan Hills facility is a commercial one. The New Jersey site is one that takes sludges and sediments. I believe the Rose Disposal Pit also takes and burns soils.

MR. CHARLES: And which one is it that does the lagoon sediments. Is that the Bridgeport Refinery?

MR. SHOSKY: Yes. The St. Ambroise site in Quebec also takes solids and soils as well.

MR. CHARLES: So it's rather difficult to find sites that are taking sediments exactly similar to ours. I know Mr. Shosky mentioned an earlier one when we were talking about solidification and stabilization in the States but ---

MR. SHOSKY: There's -- it's a bit misleading sometimes. If you look at just the types of projects that these thermal incinerators get placed on, especially the mobile ones because basically even if you have a contaminated lagoon or a very wet soil, there is a significant amount of pre-treatment of the feed stock that needs to be done and moisture content is an

extremely important aspect to the thermal treatment process.

I've worked on a couple of projects not listed here where a drawing of materials is as critical as the concentration of TPH or hydrocarbons that go in. All those parameters have to be evaluated and put in perspective of the particular unit so very wet soil typically needs to be dried in the process that we are talking about in order for it to go through an incinerator.

MR. CHARLES: On that point, I notice that in this table the moisture content for our project is listed as ranging from 15 percent for the tar cells to about 50 percent for the north pond and I was harking back to our conversation yesterday when we talked about moisture and I think you gave me the figure 20 to 30 percent moisture. I'm just wondering why the difference.

MR. SHOSKY: Perhaps I didn't clarify that on Saturday but we did say it was as high as 40 but it's still a significant range and would fall between 15 and 50 percent. We can say -- we have data that shows it as high as 40 right now.

MR. CHARLES: Right now but it could go to 50.

MR. SHOSKY: Possibly.

MR. CHARLES: So when you put -- or whoever put the 50 in here was just being cautious?

MR. SHOSKY: Yes, it was being cautious. And again, at 50 percent moisture content, that is not a material that will go directly into the incinerator. There's -- okay.

MR. CHARLES: No, but it means that your whole process is made more complicated by the time for dewatering and that sort of thing, right. If you're going to do natural dewatering.

MR. SHOSKY: That's correct.

MR. CHARLES: I also noticed that the heat content listed here for the tar ponds incinerator is four thousand to ten thousand BTU's. That's pretty high, I take it, isn't it for feed stock.

MR. SHOSKY: And just for the audience BTU values are British Thermal Units. And when you look at a range between four thousand and ten thousand, typically a good black coal is around eight. And this would be too high for -- at the ten thousand range too high to be placed directly into the incinerator. So as we discussed briefly earlier, this whole idea of being able to control the feed stock that goes into the incinerator so that it receives only materials that it's capable of burning efficiently, this is another critical parameter.

MR. CHARLES: The -- controlling the feed stock in terms of its moisture content and in terms of its homogeneity is an important factor, I take it in any incinerator operation.

MR. SHOSKY: That's correct. The particle size, distribution is very important, contaminant concentrations are very important. And the BTU values are very important in order to ensure that the operation of the incinerator is sufficient.

MR. CHARLES: Knowing what you know about the sediment that you're going to be dealing with, do you see this as a big problem or a moderate problem or a small problem in terms of achieving your homogeneity that you want?

MR. SHOSKY: If we look through the process that I discussed earlier, there's several times and we discussed this a bit on Saturday when we talked about when the material comes out as -- and some blending occurs right off the -- right when we start from the excavation process, there's two or three steps where material will be -- sediments will be moved, blended, conditioned so that it's acceptable for the feed stock. And I would rank it as something -- it's not an insignificant issue because of the volume but it's not -- it doesn't appear at this point in time to be too

terribly complex because we're not estimating a lot of materials that would be too big to put through the incinerator.

MR. CHARLES: And that too big material will be filtered out ahead of time anyhow, wouldn't it?

MR. SHOSKY: That's correct. Typically anything over about two inches.

MR. CHARLES: You may not be able to answer the next question and I apologize for asking it and we should have asked it before, but with regard to the incinerator that you have listed, do you have any experience or history of any exceedences that these incinerators have experienced? We didn't ask that question so I'm not expecting you to have provided us with an answer but in your own -- on the basis of your own knowledge, would you have any information about the experience with ---

MR. SHOSKY: What I can -- what I'll give you an answer for is my experience in general with incinerators and permits is that it varies from location to location, site to site. And the permits are extremely specific. The more permanent the facility such as Swan Hills which is a very permanent commercial facility they're -- they have very strict protocols on feed stock reporting. Everything is very well documented. The

further we go back in time with more of the mobile incinerators it's harder and harder to get that documentation because the project's either closed or something has happened.

MR. CHARLES: I see. All right. I think I was reading somewhere in the EIS that your air dispersion models are being evaluated. You have three different air dispersion models and I was wondering if that re-evaluation or evaluation had been completed.

MR. GILLIS: I'll ask Dr. John Walker to comment on that please.

DR. WALKER: I'm sorry, I don't recognize the reference to them being evaluated. I can explain the three dispersion models if you like.

MR. CHARLES: All right. Well, I don't have it at my fingertips here either so I'll have to dig that one out. But I -- unless I was imaging it, that's not beyond speculation, I think I saw it. But in any event, I'll get you the precise -- but go ahead and answer the question.

DR. WALKER: During the initial part of the siting study we used CALPUF which is a research grade state of the art model that was actually developed by a -- can you hear me now, I wasn't too audible earlier -- it was developed in fact by Earth Tech. CALPUF is quite

accurate but very demanding in terms of the data input requirements and it's very slow computationally.

When we came to looking in more detail at the impact assessment, the incinerator dispersion modelling exercise was going directly towards the health risk assessment that Dr. Magee has been talking about. In order to do that there's a very strict protocol for conducting a health -- human health risk assessment that's published by the U.S. Environmental Protection Agency. We used one that was -- we started off with an older one and then they published a new version in December of last year which we adhered to completely and that one called for air mode to be used.

Air mode is -- was or is a relatively new model and was just promulgated last year by the U.S.E.P.A. for use in studies such as this. And it was developed by the American Meterological Society to improve and to replace the previous model that was used in regulatory context. And that in fact, was the third model we used and that was ISC. ISC stands for Industrial Source Complex. ISC was used by the team looking at the emissions of dust and odour from the landfill or the potential landfill from the solidification and stabilization part and from the coke ovens land farming exercise also for truck emissions and

various other nuisance emissions.

Air mode is a better model than ISC. It's generally recognized. However, where ISC fails to be good as air mode it is much more conservative, especially in this context. And we've done a re-evaluation and I -- maybe that's the one that was referred to. I'm sorry. I didn't think it was in the IR's. But I'm being corrected as we speak.

MR. CHARLES: My memory's in tact, is it?

DR. WALKER: Wonderful, sir. Just wonderful.

MR. CHARLES: Good. Good.

DR. WALKER: What we found, we looked at -- the problem was really, the computational time. This modelling exercise, we had some sequential data steps in that we had to generate the human health risk assessment with a deposition and various other terms to go to Dr. Stephenson and Dr. Magee. So the pressure was there to do it very quickly. Air mode, we ran very intensively to -- in order to produce that. I believe that when ISC was started originally, we were thinking of going to air mode as well but there just was not time because of the number of scenarios that were evaluated. It's a very comprehensive assessment that was done there.

Afterwards we looked at what the impact

that was, at the sensitivity of our conclusions. In fact, I don't know if Dr. Magee wants to speak to the point but we actually found that the ISC estimations of the dust and the vapours in the coke oven site and from the tar ponds site were over estimated by perhaps a factor of three, simply because the model in the complex terrain defaults to a very conservative value. It defaults to another EPA model. I'm sorry about the acronyms but it's called Complex 2 which takes essentially a plumed central line for any receptor that is located higher than the release point and since the release point in this case was actually sea level effectively or close to sea level, and the receptors were up hill in every case. It defaulted to very conservative calculation mode and produced some higher estimates than we achieved by running air mode in that same data set.

MR. CHARLES: And that was true of both Victoria Junction and Phalen?

DR. WALKER: I don't know how much we have -- it was air mode only on the Phalen site. And for the incinerator but you didn't do the groundlevel at Phalen.

DR. MAGEE: Shall I just ---

DR. WALKER: Yeah, why don't you ---

DR. MAGEE: If I might add, the risk assessment for the on site activities is the one where we

used ISC. You'll probably hear more in the coming days that we did add conservative layer upon conservative layer when doing the risk assessment for the on site activities. All of the various things that would go on for eight or nine years.

Because the design has not been completed yet, the detail design, we as the risk assessors had to make some decisions about worse case situations that could occur. They might work here, there and in area A, B and C all in the same year. They may not but if they do there would be emissions. So we established a very complicated series of multiple scenarios where we ran 250 to 300 different combinations of things happening, various work activities happening in the same year. And for that, air mode would simply still be calculating today if we had started that -- the model run in August.

So it was simply impossible to use air mode for so many different scenarios. We knew that ISC would over predict. We just said that's fine, it'll be one more layer of conservatism on the model results. However, recently we did run one of the key constituents, Naphthalene through the entire model side by side comparing air mode to ISC and I believe that's the direct comparison you're referring to in the IR responses. And we did, indeed find that air mode gives a result about 20

percent of the result of ISC so we have in all of the numbers presented in the risk assessment reports given you for the on site activities over-estimates by a factor of three or more.

MR. CHARLES: Thank you very much. I'd like to switch gears just for a moment and talk about costs. The EIS puts forward some numbers relating to the cost of incineration off site but I didn't see any numbers indicating what the cost of incineration on site or using the mobile incinerator might be. Are such costs per tonne estimates available?

MR. SHOSKY: We're ready. Unfortunately I'll have to ask you for a little bit of clarification. And let me explain why. The incineration component of the work as we've discussed involves a lot of different aspects and to fairly, if the intent is to use this number as a cost comparative with other alternatives would be to include items such as infrastructure development for the incinerator that's other handling conditions and things of that nature, obviously the simple price per tonne, a price of operating and treating the material as a stand-alone item would be much different if it doesn't include the rest of the elements associated with it. And I'm just curious as to how you would like that number given to you.

MR. CHARLES: Well, I agree that you know, the Proponent has commented on the cost estimates that came out in the RAER report and said that they weren't high enough because they didn't include some of these other things. And so I'd like to be in a position as a member of the panel to be able to compare apples and apples. And so if you're, you know, putting forward numbers about the costs of alternative technologies, I'd like to be able to compare it with the costs of the projected activities that you're proposing for the tar ponds. And one of those -- one of the aspects is the incineration. And I'm just trying to get a sense of how much the incineration's going to cost.

Now I know we've got a ball park figure of eighty-one million five hundred thousand for the whole works, including decommissioning. But I want to know what it's going to cost to actually process the material. And you can put in the extra costs if you want as long it's the same calculation that we get for the other alternative technology.

MR. SHOSKY: Yes and honestly when you do an alternative analysis and one of the problems you have when you do that type of alternative analysis with various vendors is typically they're most interested in giving you their "price per tonne" for them doing the

work without any of the additional extras that would be required in to -- in order to have that particular technology plugged into the work and make sense as part of the overall project. So what I'm taking as an indication of what we would do is probably give you a rough cost per tonne for the burning of the material and a separate fee which I would consider a handling fee to -- or a conditioning fee in order to get the material up to the incinerator.

That fee would be intended to apply to the other technologies that could possibly be evaluated against the ones that we have selected because in the alternatives analysis there is -- all of those technologies should they have been implemented, would have needed to have those additional fees placed upon them in order to fit properly in the project as it's laid out. Does that make sense?

MR. CHARLES: Well, it does to the extent that the proponent I think has suggested what these alternative technology costs would be if they had added all these other things, right?

MR. SHOSKY: It -- typically those additional costs did not include the additional handling fees that would be necessary in order to make it appropriate for placement in that system.

MR. CHARLES: Yeah. When I was trying to go through this myself, I asked what would you include when you were trying to come to a cost per tonne valuation? You know, how -- cost of excavation, cost of handling, cost of transportation, would you include cost of monitoring, the cost of disposing of the residue and so on. And I realize that it's fairly complicated situation.

MR. SHOSKY: It's very complicated.

MR. CHARLES: But all I'm interested in doing is giving the panel some basis upon which to compare relative costs when we're talking about the costs of this project and then in any alternative technologies. Now I realize as you said, the people proposing relative technology, they are other alternate technologies haven't explained how they got their costs. Maybe they will when we hear from them. But at the end of the day we're going to have to have some standard from which to try and assess these things.

MR. SHOSKY: I agree and we'll -- we would like to take that as an undertaking. Now that I have that clarification I believe I understand what you're looking for. [u]

MR. CHARLES: Thank you very much. A simple question. It relates to the bypass stack and its

physical location in the incinerator. Is it before or after the secondary combustion chamber?

MR. GILLIS: I would again ask Don Shosky to answer that question regarding the location of the bypass stack.

MR. SHOSKY: I believe we have a flow chart of a typical incineration diagram. Let me take a moment to find it and we'll put it on the projection screen.

MR. CHARLES: Is it one that's already been provided in the materials?

MR. SHOSKY: No, no. I think we have another drawing. I believe we have that we'd like to present that'll make it a little bit clearer where these components sit.

MR. CHARLES: All right. Then I'll ask the second part of my question. Is it technically and economically feasible to mitigate the effects of a bypass release?

MR. SHOSKY: The short answer is yes. The longer answer is not in all circumstances. It depends on the type of systems that ultimately would get employed out there onto the site and that's of -- as you know, we've left it open at this point for a number of different types of technologies to be put out there. So

it really depends on how those additional control technologies would go with a particular unit that would be finally selected.

MR. CHARLES: Okay, but there's been a lot of concern raised about the effects of bypass problems and how often they would occur and this sort of thing. I'm just wondering when the risk assessment was made I got the impression that it was done on the understanding or on the assumption that there were no pollution control facilities in place. And if that's correct, then of course, it would seem to take care of any bypass material. Go ahead, let's go back to the first and see if we can locate it first. Will this diagram be provided to the panel?

MR. SHOSKY: Certainly, yes. I need to apologize for the quality of this. If you'll give us a moment and we'll see if we can blow it up a bit so that the audience can have a better feel for it. If you pull it back just a little. Again, Mr. Charles could you ---

MR. CHARLES: You can call me doctor if you like.

MR. SHOSKY: Okay. I was called Dr. Shosky during the transcripts and I'm not a doctor so I'm a little sensitive about it.

MR. CHARLES: Well, I am a doctor.

MR. SHOSKY: Okay. Dr. Charles ---

MR. CHARLES: But it's Honorary so it doesn't count.

MR. SHOSKY: --- could you restate your question again, please.

MR. CHARLES: Yeah, where is the bypass stack located. Is it -- in relation to the primary and the secondary combustion chamber?

MR. SHOSKY: In this over-simplified drawing, we don't have the bypass stack per se put out, and there's a number of different areas where it could occur. Basically we have our primary -- let me start from the beginning of the process and give everybody -- possibly have everybody starting from the same spot.

You have stockpiled material and processing here. It goes into -- to a grizzly screen, so this material here would be sized to typically one or two-inch minus. Material then would go into the primary combustion chamber where it's heated up to the required temperatures in order to destroy the contaminants that are withheld in the soil. That soil then drops out, ultimately gets cooled with water, and turns out as clean soil.

From this point on, everything is -- everything here are air pollution control equipment. And

the bypasses -- there are various bypasses depending on the type of unit that you would have that occur at each one of these -- in these areas here provided if you have an upset condition that would occur that would require it to relieve itself of some gas. Unfortunately, we don't have it clearly depicted on this particular flow chart where that would be.

But going through the -- so basically the soil gets treated here, the vapours and whatnot that come off of the soil come up and go through these additional thermal chambers which further destruct those airborne contaminants before they're released.

There also are in this drawing -- and there are other technologies available for it -- there's alignment carbon silo, which is typically used for the treatment and destruction of dioxin or acid gas or some of those things, and we also have a bag house, which also helps with the fine fine particulate matter that would come from the soil.

So in real simple terms, your clear soil is here, the soil -- the air emissions are all treated prior to going out into the atmosphere. What fine particles are left here get captured in the bag house, which are very very fine dust particles, and those are collected separately and analyzed. The volumes of soil

that go through here, probably 99 percent of the materials will end up in this pile here, and less than one -- typically less than one percent will end in this location.

MR. CHARLES: Is there only one gas release point, or one stack, or could there be more than one?

MR. SHOSKY: There could be more than one, depending on what the ultimate -- ultimate detailed design would be of the incinerator. Part of the reason that the incinerator technology is left open at this point is we felt that there were a number of these types of facilities or technology units on the market today currently in use that could be utilized for this project, and we felt that it would be good to go to the market and get experienced operators to come in and run the incineration equipment and also provide back-up information on previous histories.

MR. CHARLES: Okay. Thank you.

MR. GILLIS: Mr. Charles ---

MR. CHARLES: Yes.

MR. GILLIS: --- I'll ask Dr. Magee to address your -- I believe it was your second question related to the assumptions in the risk assessment itself. Is that correct?

MR. CHARLES: Yes.

MR. GILLIS: Okay.

DR. MAGEE: Thank you very much, Mr. Gillis. Yes, we were concerned about upset conditions in the risk assessment. We needed to ensure that the assessment was very conservative, which is our parlance means health protective.

We did that in two major ways. One is we vastly over-estimated how long we assumed the incinerator was going to run just in general. So we know that the incinerator is designed to operate for three years. That's all you need to run it for to get rid of all the material we're talking about.

However, we assumed, just as a matter of course, for health protectiveness, that the machine would operate all the time for five years in to to. So we've almost doubled the amount of emissions, routine emissions, but nonetheless, we've said that twice as much is going to come out of that stack as really will.

But then on top of that, we decided that it would be best to also directly address the issue of upsets. We were told from the engineers that upsets, usually when they happen, happen maybe once or twice a year for a minute or so. We said, well that's not good enough. Let us assume, against to be protective, that

there are upsets that occur for a matter of 30 minutes every month for the entire five years.

Now when we had that upset going, we just said let's look at the guidance and see what they would assume upsets occur at in terms of emissions. The guidance says 10 fold higher. We said, okay, fine, let's upset all the emissions by 10. So two levels, and the more specific is, assuming a 30-minute release at 10 fold higher emissions once a month every month for five years.

MR. CHARLES: Thank you very much.

DR. MAGEE: And the results -- if I might add one more statement, the results, of course, were quite below the project significance levels when we did that.

MR. CHARLES: Okay. Thanks. My understanding is that the EPA has a different standard for incineration of material that's got a higher organic content, and they suggest -- I guess it's only a suggestion -- that you assume that the incinerator is going to be out of action 20 percent of the time. And I think in your response to public comment 24, you explain why you've used the 30-minute, once-a-month standard rather than the EPA standard. And I take it that you consider the EPA standard not to be reasonable?

DR. MAGEE: Yes. I'm well aware of that

clause in the specific chapter that talks about upsets in the guidance. That's the guidance we followed in general that -- a guidance that came out just a few months before we started the project.

What they're referring to there, they directly cite a very old document from CAPCOA, which is the California Air Resources Board. I'm sorry, the CARB, C-A-R-B. And we looked for that. We went onto the website and made some phone calls. That document that EPA refers to just simply does not exist any longer. It was present in some guidance from the late 1980s, and I believe EPA does not -- did not do their homework to check to see whether that document was still valid. Obviously what I wanted to do was get my hands on it and look at it and see what it was based on. It simply does not exist any longer.

I'm not the compliance person here, but I can tell you that if that incinerator operated 20 percent of the time, i.e., day after day out of compliance, not in compliance with its permit, I'm sure it would be shut down after only a day or two or three, not 20 percent of the time. So we just felt it's unrealistic and unreasonable.

MR. CHARLES: So you're satisfied with the standard that you've used.

DR. MAGEE: Not only am I satisfied, but the risk results are based on such conservative assumptions, that even when we take that into account and say, "Well maybe it's higher. Let's up it by another factor, another factor, another factor," we are so far below levels of concern for realistic exposure pathways, that we have quite a lot of margin of safety. So yes, I'm quite satisfied.

MR. CHARLES: Okay. Thank you very much. I would like to defer to my colleague, the doctor over here, because he has some questions about ash, which I'd like him to ask at this point.

DR. LAPIERRE: Thanks a lot, Bill. I'll give you a break. It's a tag team here. I would just like to have one question maybe on the model. Could you give an indication how many assumptions you used in the air dispersion model versus how many real data points?

MR. GILLIS: So just so that I'm clear, the question is you want to understand where we had real data to give us numbers, and then base that back to the kinds of assumptions we made.

DR. LAPIERRE: Yes. I just heard some of the assumptions you used, which was positive.

MR. GILLIS: Yeah.

DR. LAPIERRE: I'd like to know how many

you used, that's all.

MR. GILLIS: Okay. It seems to me that what we should do here is ask Dr. Walker to talk about the kinds of information he used in his air modelling exercise and his -- with respect to emissions and the weather data that was used from a meteorological viewpoint, both real and assumed, as you say, and then move to Dr. Magee to see how he took that information and went further into the risk assessment. Would that be the ---

DR. LAPIERRE: That's fine. I'd just like to have some information.

MR. GILLIS: Okay. Great.

DR. LAPIERRE: And you might add some statistical parameters, too, that you used to address that.

DR. WALKER: The largest set of assumptions that went into the modelling were in fact on the emission rates from the incinerator. And I know this caused some concern in the IR. And we'd like to clarify that that what we did was take the limits where limits were prescribed by regulation or by CCME guideline. And these limits are not limits in the same sense of a speed limit. When the CCME says 80 picograms per cubic meter, it's not like saying 100 kilometres an hour and you drive

100 kilometres an hour. It means that you must design a system that's not going to come close to that because you have to allow for a factor of safety.

So the emission limits in every case were based on regulation or on guidance, save for one, and that's the mercury, which Dr. Magee will come back to later.

In terms of weather data, we proceeded with Sydney meteorological surface data, save for upper air data from Yarmouth. There's a few upper air stations, one being Yarmouth, another being in Stephenville. There's one in northern Maine, there's one on Sable Island, and there's one in Trois Rivieres, I believe. We used Yarmouth. We have usually done for Nova Scotia. I've been in Stephenville, and I can -- I think I just have a gut feeling that the 1,000 and 1,500-foot cliffs affect the upper air flow there. These models are most sensitive to surface level, not to upper air data in any case.

Now, we did use precipitation data for Yarmouth, and that was because we had it in hand and we had to proceed with the modelling as quickly as we could. And we recognize that Sydney may have been a better choice in that regard, but it doesn't make any appreciable difference to the overall conclusions.

The way the dispersion models work is that they mathematically simulate the rise of gas from a stack, and it transfers down wind. The down wind transfer is based on the wind speed, so that at the top of the stack, there's a dilution that's caused directly by the speed of the wind across the top of the stack.

The vertical position of the plume is determined by two things. One is the velocity and the momentum built into the plume from the velocity, and that governs the upward rise. The other thing is the temperature of the plume. The warmer air will rise a little bit farther. When the wind is a little bit stronger, the wind will tend to knock out the momentum and bring the plume down to the surface a little sooner. So that contrary to intuition, sometimes it's the stronger wind speeds that result in the higher level of ground level concentration.

You can think of the dispersion from one incinerator or two incinerators, which is another question that may arise. If you think of it in terms of perhaps a flashlight beam on the floor, where if you have two flashlights, they tend to overlap, and in fact, these -- the incinerator technology is left a little bit open, so it could be that there are two incinerators running at half strength, so that the ground -- each flashlight

would be half of the power of the other, and the resulting ground level concentration would in fact be the same.

And while we're at it, if you happen to have one of those fancy flashlights that turns and the beam spreads, that's -- that's the same affect as turbulence in the atmosphere, which is another thing that we try to measure. That's probably the hardest thing we try to measure. Air Mod does a much better job of that than IFC, and generally will result in lower -- Air Mod has a -- is less conservative than IFC because it's more accurate.

The assumptions -- there are some assumptions that go into the derivation of the meteorological data set for running the model. Air Mod will account for what's called the streamline height so that the wind field is passing over the hills, and the size of the hill -- sometimes the air goes over the hill, sometimes the air goes around the hills. Air Mod will more or less correctly infer how much of each it does, whereas IFC doesn't really account for the hills being there. It just discounts for the fact that maybe a receptor is up in the air somewhere.

In the case of the Coke Oven site, as I mentioned previously, that's a negative thing because it

assumes that despite the temperature and despite the momentum of the plume, the center line is going straight at the receptor.

I'm losing track of where I've gotten so far.

We've looked at -- when we do the modelling, we use -- it's all computer based, and we look at the worst conditions generally. We look at typically the worst one hour out of a five-year data set, and that gives us an indication of compliance with the one-hour standards. We assume that over that one-year -- or five-year period, that we've accounted for most of the adverse meteorological conditions that can occur, and that's an accepted level. The U.S. will accept down to one year, using CALPUF for that purpose.

We also look at 24-hour averages for, for example, particulate matter where there's a 24-hour standard, and we produce the long-term of period averages for the data set, and these are the numbers that are provided to Dr. Magee and Dr. Stephenson for the risk analysis.

In addition to producing concentration estimates, we also produce some deposition estimates. Deposition is driven most directly by the concentration itself, and these -- where these models have a failing is

that they're not terribly good at the deposition estimates, so they tend to be a bit on the conservative side.

The Human Health Risk Assessment Protocol that we use specifies that you will use for the various organic contaminants a suite of parameters that include the molecular weight, the vapour pressure, and the vapour pressure tells you something about how the -- for example, the PCBs or anything that's presumed to be in this gas will partition between a vapour phase and a particulate depositional phase. In general, stuff may come out wet, it may come out dry to the surface, and it's driven -- it's a direct function of the downwind concentration.

Did I leave anything out for you?

DR. LAPIERRE: Well, just two additional questions, I guess. When you considered using data from Yarmouth, did you consider using the GEM model to generate your local data? GEM is the met data Environment Canada uses for ---

DR. WALKER: No, we -- the surface -- the wind speed and the wind direction were measured directly at Sydney Airport. We used the 10-metre air data set from 10 miles -- five miles away, which is ---

DR. LAPIERRE: So what did you use from

Yarmouth?

DR. WALKER: From Yarmouth, we used the upper air ---

DR. LAPIERRE: The higher -- upper air.

DR. WALKER: --- the 900 millibar, the 950 millibar, 1,000 millibar. They're used ---

DR. LAPIERRE: And I guess the other question is how did you treat inversions. You talked about one hour and -- but did you push inversions to, say, one month of inversion, what would happen, or two weeks, or did you go beyond your one hours?

DR. WALKER: No. The inversions are accounted for in the mixing height computation. Inversions are a daily phenomenon that happen at sunrise and dissipate at sunset. Inversion conditions are what limits the vertical spreading of the plume.

In addition to the vertical -- or I'm sorry, the lateral spreading of the plume and the vertical spreading, there is a limit to how high a plume will tend to go in the urban atmosphere or in any atmosphere, for that matter. It tends to be in the order of several hundred metres, at minimum, to a thousand metres perhaps maximum.

The significance here is -- it's interesting to look at because we have maximum ground

level effects that tend to occur within the 500 to 1,000 metres of the stack. That means that that plume hasn't reached the inversion. The plume -- the effect of an inversion is a lot like a reflective layer, so that the plume goes up and reflects downwards. Mathematically that's how you account for it.

So when we're looking at a maximum ground level effect within that first 500 to 1,000 metres, we're looking at a plume that hasn't had time to go up and come down again. So the -- in that sense, the inversion doesn't enter into play.

DR. LAPIERRE: Maybe I didn't explain myself correctly, but I'm thinking of those few weeks in the summertime in which you get stale air -- and we get stale air -- we don't get that much in Atlantic Canada, but we do get some -- that just stays there. And what goes up stays very close to where it goes, and it can stay till the next movement comes along. How did the model treat that? Did it homogenize all of this into the process?

DR. WALKER: Yeah, the model -- the model will handle -- even though it's a very quiet atmosphere at times like that, the situation you're describing is a high pressure subsidence inversion, and it relates to a continent's scale phenomenon called the establishment --

or the Bermuda ridge, the Bermuda high, which tends to cause a continental eastern North America flow of southern air towards -- so that we are -- we are actually importing at that time the haze that you see at that time. And we tend -- in the Halifax area, there's -- Kejimkujik area, there's an ozone associated with that because it is bringing up stuff from the U.S.

DR. LAPIERRE: So we do get a pollution index at that time.

DR. WALKER: You do in fact. And these data -- those -- we have not edited out any data, and I things the Sydney data set was very very complete, so it is in there. Air Mod is actually very good at handling those situations.

So the short answer -- and I think I'm being encouraged to have one -- is that those data are in the data set, and thus we did account for them.

DR. LAPIERRE: So you can assure me that the -- whatever comes out of your stack is not going to be accumulated in an area at anytime with -- under any adverse weather conditions.

DR. WALKER: I think that's a safe assumption from -- to make.

MR. GILLIS: So that -- that talks about the inputs to the Health Risk Assessment. Would you like

to have Dr. Magee go through the way that he went through the analysis for the health risk point of view with the same inputs?

DR. LAPIERRE: I don't know if people want to hear all of this, but you know, I guess if ---

MR. GILLIS: It's an important consideration, so ---

DR. LAPIERRE: If it's relevant, it should be said.

MR. GILLIS: Okay.

DR. MAGEE: Well I will try to hit the high points.

Once the air modelling is completed and the entire set of air concentrations, vapour deposition, wet depth, dry depth, all of that stuff is provided to the second team that takes over, which is my team, we have two things to do. First is the transport. We've got to get the material to the appropriate places -- the soil, the water, the farm and so forth -- and then we have to have the people eat the produce and so forth.

In the first step, there's really very little in the way of assumptions. We have the topography, we have the maps, we go, we look and see where the ponds, the lakes are, where's the water supply, where do people fish, where can people farm. None of

that is assumption. That's all site specific data, and you can see all the maps and all the tables in our reports.

But the second step says, well, find what do people do. When we look at the results in our report for the resident, I think there's very little assumption there, because what we've got the resident doing, we look at the maps, we find the closest residential location, and we say, "Well someone can breathe air there, can they not? Yes, of course. They could have a backyard garden. Yes, of course. The kids could play in the soil. Of course. They could drink water from the nearest reservoir and they could swim in the nearest lake, pond, or what have you." So the exact assumption of what their body weight is and how much water they drink, well that's a standard Health Canada assumption, but certainly there are no assumptions about where people are and what they're doing.

Where we do add assumptions that now are very conservative is where we get into the toddler fisher and the toddler farmer. So, for instance, there is a lake very close by. Grand Lake. Of course. Are there fish in there? Of course. We assume the Health Canada assumptions of a child, a toddler, a toddler consuming so many grams -- I believe it's 56 grams of fish each and

every day that they or their parents catch from Grand Lake.

Now, that is an assumption because I've done the sustainability calculation, and there is enough fish in Grand Lake every year for three toddlers, if they really sent their parents out there every morning to catch fish, you could supply enough fish for three toddlers, but you couldn't supply a large amount of fish. So is that likely that a toddler is never going to eat, you know, chicken dips from, you know, some fast food restaurant, or beef or eggs -- all they're eating is fish? Not likely. But the guidance makes us do that, and so we do.

And ditto in spades for the farm. We go to the nearest location where a farm could be, and we say, someone could be a subsistence farmer there. They don't just have dairy or they don't just raise tomatoes. They raise all of their produce, all of their beef, all of their dairy, all of their pork, all of their poultry, all of their eggs, all in that location, and the entire family eats all of those food items every day on their plate. The plates must be huge. I don't know how they can fit on the table, they have so much food on them.

Now, why do we do that? Because we're following the guidance to the "T". And they say "Maybe

it's not likely in the guidance that there really could be a subsistence family eating everything grown from that worst case location, but it's possible, so we want you to assess it and we want you to have your risk assessment pass."

So at that back end, we really are pulling out some assumptions, but what it does is make the entire set of results very health protective.

DR. LAPIERRE: Was the -- is the model that you use for the lake and the fish, for example -- I guess a few questions. Is it a three dimensional model? And do all fish accumulate all toxins at the same rate? I mean, is it possible that someone would eat a fish that accumulates the toxin at a higher rate, and therefore have a capacity to ingest more toxins?

DR. MAGEE: The reality of the situation, I'm sure, is true. Different fish do accumulate different substances at different rates. However, the guidance is very conservative. Again, this is the U.S. EPA guidance that has been reviewed and validated and finally went final literally a month before we started this project.

So what they do is they scour the literature and they gather all of the bio-accumulation factors for PCBs, all of the bio-accumulation factors for

mercury and for PAHs and what have you, and they take the worst one and say, "We don't care whether you have that kind of fish or not. We want you to run the risk assessment assuming the worst case uptake and so forth."

The model is three dimensional. It takes the material that lands on the lake. It takes the run-off that comes from the streams. It has the constituent when it hits the water body. It partitions into a dissolve phase, into a -- absorbed onto particles, and then there's also a [--] sediment phase. All of that is standard EPA fair, all the equations we ran in our reports, and we did it exactly in accordance to guidance.

DR. LAPIERRE: Okay. Thank you.

MR. GILLIS: That pretty well sums up the Risk Assessment.

DR. LAPIERRE: I have one yet.

MR. GILLIS: Okay.

DR. LAPIERRE: I would want to go back to the second question, which the second question relates to the bottom ash. The bottom ash, as I understand, that's the result of the combustion will be monitored for PCBs because you want to be sure that you're doing what you say you're going to do.

And the other aspect, will it be monitored for heavy metals? And if so, which one? And if no,

well, why not?

MR. GILLIS: The goal of the monitoring, to start off with, as you've correctly indicated, is to ensure that the material is -- the PCBs are being removed through the incineration process.

With respect to monitoring of additional compounds, perhaps I'll turn that over to Don Shosky for right now.

MR. SHOSKY: Thanks, Mr. Gillis. Our monitoring of the bottom ash -- and just so that people don't get all the ash terms confused in the audience, bottom ash is what was on my diagram called clean soil. And the clean soil that -- or bottom ash that would be tested is tested for, right now, PCBs. We had not intended on testing for metals for the following reason is that we felt that metal concentrations probably would not change much from the time that they were removed and processed thermally until the time they went back into the Tar Pond cell. And being re-stabilized would also bind those additional metals because of the pH and other stabilizing effects that cement would have on that bottom ash material.

DR. LAPIERRE: But wouldn't concentration for volume be a bit different?

MR. SHOSKY: It's possible that it could

be a little bit different because you would be taking -- reducing the overall weight of the soil. So it is possible that it would be a little different.

MR. GILLIS: Perhaps we can get to some of the discussion that we had -- or not discussion but some of the information we provided in one of the IRs. We have a bit of a model there that describes some of the concentrations. You're right if you remove the material, you may well increase the concentration, but we are also using that as a blending agent going back in. So Dr. Magee has done a little bit of an exercise here which may help explain, I believe, your question.

DR. MAGEE: Thank you, Mr. Gillis. Yes, this was our response to IR-28. And we do note that when you add the bottom ash as the conditioning agent to the feed material, in the first two or three run throughs, there would be a build-up, but if you look at the mechanics of how "X" percent is being taken back and "Y" percent is being fed back in, you do rapidly achieve a steady-state concentration.

So let me just give you a couple of examples. If you were to look at IR-21 -- 28.1, which is one of our tables -- let's see -- for instance ---

DR. LAPIERRE: 28.1 is that diagram?

DR. MAGEE: The diagram is helpful, but

right after the diagram, you'll see a table. You do see, for instance -- it's the follow-up. I'm sorry, it's the follow-up to IR-28. Should we wait for a moment and let you all -- should I go on or should you try to find it? Oh, we're going to get it on the screen. Hold on. Oh, there we go.

We don't have to walk through each of these steps, but this shows that you're adding in some of the bottom ash back in as conditioner but you're not adding it all in. It is -- well, gee, now I have to orient myself here.

So we've got a sediment. We mix it with some of the bottom ash, so now we've got -- instead of one kilogram, we've got two kilograms. We incinerate it. For the purposes of the bottom ash, we assume that actually none of the metal was going to be removed to fly ash or to emissions, except for mercury, which of course is still volatile. And then you've got your bottom ash, but a lot of it is coming back to the site. So you can't build up except for going through the cycle several times, then you do build up, you plateau at a steady state.

And for instance, for arsenic, you start with 50 parts per million. At steady state, you have 89 parts per million. So yes -- oh, there we go. So just

as an example, there is a build-up, but it builds up and plateaus. In response to the IR request, we did rerun the worker risk assessment where we said "What is the risk to the worker if they handle this ash?"

Because as you may recall, when we did the document as presented originally at the end of the year, we were under the impression at that time that the coal fly ash might be used as a conditioner. The design team said, "Well we think it makes more sense to use the bottom ash." We had to double check and make sure that it was fine. And in fact, it is.

The good news from the point of view of mercury is that the mercury level actually goes down because of the assumption that a goodly percent of it goes into the fly ash where then you do something else with it.

So is that an adequate ---

DR. LAPIERRE: So you're going to return that, once you've conditioned it, back to the pond. And would the next treatment place it back into the cell where you took the PCBs?

MR. GILLIS: I'll ask Don Shosky to talk to that. My understanding it's going to be mixed with the materials that are appropriate for the solidification stabilization to put in place, yes, but ---

MR. SHOSKY: What's going to happen after the material has been burned is that it would be tested for the PCBs to verify that it can go back to the Tar Pond. A portion of that material after that would be used as an additional drying agent for additional materials -- sediments that would be brought back up and burned. And another -- another pathway is to go through the stabilization process and placed into the monolith.

THE CHAIRPERSON: Just as a follow-up to that one. At those concentrations of the ash that's being returned, am I right in assuming it doesn't trigger any regulation as a hazardous waste?

MR. SHOSKY: It's our understanding that that's correct. That's one of the reasons why PCBs are being monitored, because there is a regulation for the concentrations of PCBs.

THE CHAIRPERSON: Well what would -- what regulation would -- at what level would concern about disposal as hazardous waste be for those metals? Or for the most sensitive one or the one that was closest to the -- this would be TDGA, would it, or -- Transportation of dangerous goods, sorry.

MR. DUNCAN: Certainly there's -- there is a number of regulations in place for the management and handling of those materials. We don't believe that there

will be any, I guess, criteria associated with placement of this material back into the matrix.

The concept, I guess, is to think about it as further treatment. Really, why you're removing the material is to remove the PCBs. That's the material you want to remove from those contaminated sediments. The material you're taking back is in essence what you took out minus the PCBs. You're taking it back to the Tar Ponds for further treatment through solidification stabilization and then containing and capping within that system.

So indeed, you're not -- it's not so much a disposal. It's you're taking it back down for further treatment for the remaining contaminants that are still in the materials.

THE CHAIRPERSON: I appreciate the logic of what you're saying, but regulation is not always applied by logic. So maybe we could also just clarify this with the regulators when the present.

MR. DUNCAN: Certainly. And as you've touched on, there will be further discussion with the regulators as we get into the detailed design and the permitting and approval stage. That obviously is the next step in the process. Beyond the environmental assessment from the planning and the assessment of

environmental effects associated with the activities, there will be a number of permits and approvals required in order to carry out these activities and to operate these facilities and to transport the materials, so we need to have those detailed discussions with the regulators, and as you can understand, they'll want to know, "Well, tell me -- we need to have a certain level of detail before we can provide you with a permit to do that." And the detailed design will provide that level of detail.

THE CHAIRPERSON: But if in fact for any reason you weren't allowed to return that bottom ash to the Tar Ponds, that would have a certain cost implication for the project.

MR. DUNCAN: It certainly would, yes.

MR. CHARLES: I think in the EIS, it also mentioned that if the first burn through doesn't achieve the desired effect and you still have some residue with more than 50 parts per million in it, that it would be sent back through the incinerator again or otherwise treated. Is that correct?

MR. SHOSKY: Yes, that's correct. Materials that don't meet the 50 parts per million PCB would be retreated through the thermal treatment plant. Of course we would also be looking at why that happened -

--

MR. CHARLES: Yes.

MR. SHOSKY: --- but they would be tested.

MR. CHARLES: I was going to say, it would be kind of an unexpected event, wouldn't it? I mean, you're operating at pretty high temperatures for PCBs.

MR. SHOSKY: We suspect it would be highly unlikely.

MR. CHARLES: Okay. The second question is are you going to have two sets of operating conditions in the sense that you've got PCBs and you're also treating PAHs. Are you just going to use the highest temperature and burn everything with the one set of operating conditions?

MR. SHOSKY: The intention is to have one set of operating conditions where we are really evaluating the feed stock for key parameters prior to it being thermally treated by the incinerator. The whole homogeneity issue of trying to make a consistent feed stock which allows the incinerator to most thoroughly and efficiently treat that material is what our major concern is.

So in the case, for example, of high concentrations of organics, if they're over a certain concentration, they'll need to be blended down as well

with the BTU value that we talked about earlier so that it stays within the parameters that the incinerator can treat.

MR. CHARLES: Thank you very much. Those are all the questions I have.

THE CHAIRPERSON: I would like to ask one that takes us right back to the beginning of one of the earlier questions that Bill asked. I'm just -- I'm interested in the -- your -- the examples you brought forward. You brought forward three permanent and two mobile, or two transportable, whatever you want to call them. Is that correct? I better find my table as well.

MR. GILLIS: Is it IR-41 -- is that correct -- with the examples of the operation?

THE CHAIRPERSON: Yes. IR-41. So Swan Hills, the Quebec one, and Belledune are all permanent commercial facilities? And the other two presumably were transportable or mobile?

MR. SHOSKY: Yes, ma'am.

THE CHAIRPERSON: And the dates -- you indicated that you wanted to give us more current examples than Goose Bay and Smithville. And the dates -- I'm just looking at the mobile one because it just seems -- you know, that's what you're proposing here, but -- so the dates are -- for the Rose disposal pit is '94. Is

that right? And the description doesn't exactly say when the Bridgeport was -- I may have missed something in the table. If so, I'd be happy to have you tell me.

But the Bridgeport one, the record of decision, the US EPA record of decision was in '84, and then the only other reference to time that I saw was that it took 50 months to treat the material. So, I don't know whether they started in '84 or '85 or something.

Anyway, I don't want to belabour this but that's not an awfully recent example, I guess, is my one point. And does somebody want to confirm that I'm correct in what I'm seeing in terms of the dates of these two operations?

MR. SHOSKY: Part of the problem with coming up with examples was being able to fill all the categories that we needed to fill, and as a result of that we ended going to a lot of established literature where sites were closed and finalized and issues like that had been resolved, and as a result of that exercise these were the sites we decided upon.

There are other sites that are being worked on now, there are other sites that are being worked on in various state programs and provincial programs. It is possible, given enough time, that we could find additional sites to work through with you for

examples, but for all of the categories of information that you wanted these were the best fit that we could find.

THE CHAIRPERSON: Um-hmm. Okay. Now, would Goose Bay -- or, I'm sorry, when did you say -- Goose Bay 15 years ago, was that your suggestion? It's not much beyond that. I've -- I take it that ---

MR. GILLIS: I believe it's 15 to 20 years but we can certainly check on that one. That's pretty -- yeah.

THE CHAIRPERSON: Yes, if you would. I mean, I can remember it and it's -- and there's a lot that don't remember 20 years ago, so I have a feeling it might have been less than that but -- and I take it -- I mean, what was the experience at Goose Bay? Was that a successful operation? You've cited it as such.

Mr. Charles made reference to the fact that you've cited both Smithville and Goose Bay and you cited them as being two successful examples of an incineration, so that's just a more curiosity.

But more to -- the other thing that I was interested in, in just practical terms, is are there spare mobile incinerators in Canada? Are you expecting to be able to procure this from a Canadian source? And if there are, what are they doing right now? I mean, are

mobile incinerators -- I don't think they're -- perhaps I'll ask you this. They're not that easy.

Have there been many examples of mobile incinerators in use in the last, say, five years in Canada? Are these units sitting around? Are they busy? Are they -- are you going to have plenty to choose from?

MR. GILLIS: Typically, on a -- having gone through this exercise recently in another country and, well, several other countries and also around North America, when you go for incineration services, procuring incineration services from vendors, often now it's an international tendering.

When I received tenders back at the times I've requested them, there have been Canadian firms that have offered to put bids in on those sites. So, the short answer is yes, there's Canadian firms out there.

I'm not at liberty right now to give you names of various Canadian firms but I would certainly recommend to the Sydney Tar Ponds Agency that we not just look at Canadian firms but that we look at the best firms with the best track record for this particular job and to ensure that the standards that are going to be set for that thermal treatment activity are the best available technology by one of the best companies around that can do it.

THE CHAIRPERSON: And if you were to try and find some examples of mobile incinerators, more recent examples -- and if, you know, we remove the requirement to fill in all those blocks on the table -- would that be relatively easy to do, to indicate, you know, where mobile incineration projects have occurred, let's say, in Canada, whether they were using Canadian or international equipment? But are you able to cite those examples?

MR. SHOSKY: We can certainly take that as an undertaking, and if some of the other requirements are lifted it would make it easier to find a number of sites.

Again, we'll run into the privacy issue that we had with the commercial sites that we had talked about earlier and we might have to get some additional approvals from various vendors or their clients in order to have that information released, but we can certainly attempt to do it for you.

THE CHAIRPERSON: But how private can you be with an incinerator? I mean, is that not something that you can obtain information from government sources? They all have to be permitted.

MR. SHOSKY: Yes.

THE CHAIRPERSON: I'm just -- by all means, yes, you don't have to gather us all this

information, but I'd just be interested in where have mobile incinerators been permitted in Canada in the last 10 years.

MR. SHOSKY: No, you're right, obtainment of the information from public sources isn't that difficult, but if you get down to possibly cost per tonne or any of the costing issues and things of that nature it might be a bigger problem.

THE CHAIRPERSON: So, is that now an undertaking?

MR. GILLIS: We'll take it as an undertaking to look back in the past 10 years to look for mobile incinerator projects in Canada. [u]

THE CHAIRPERSON: Thank you. And one more question around mobile incinerators that I've just been reminded of is the question of -- in terms of if you do site a mobile incinerator at the VJ Site, who will be permitting that incinerator with reference to the land ownership?

MR. POTTER: The actual obtaining of the permit will be the responsibility of the vendor, as that'll be part of the contract conditions.

STPA, as the Proponent, will be the one overseeing that but it'll likely show up in the contract that the person obtaining the permit will be the actual

vendor taking -- undertaking the incineration.

MR. SHOSKY: I'd like to add to that for a moment, if I may.

STPA would work with the regulators to determine what the permit conditions would be, and the permit conditions would be set forth to the various vendors who put together the tenders but the actual permit will be in the name of the vendor.

THE CHAIRPERSON: Sorry, I'd better ask my question again. I was not clear what I wanted to know.

It relates to the land ownership and currently the VJ Site is in federal crown ownership. I understand there is a somewhat different regulatory regime for a mobile PCB incinerator depending on what the -- where it's sited and who has the ownership of the land. So, are you anticipating that this will -- actually, let me back right up with a question before that.

Are you sure that the owner of the land is willing to have an incinerator placed on it?

MR. POTTER: Good question. It's one that we've looked at and for that very purpose we've initiated discussions with the current owner of the land, and the intention would be that prior to the incinerator going to that site that we would be taking -- the province would

be taking over ownership of the property and would be in control of the land at that point in time.

We would expect that we would be dealing with the provincial Department of Environment for the necessary permits on that property.

THE CHAIRPERSON: So, in other words, the federal regulations on mobile PCB incinerators would not apply?

MR. POTTER: That would be correct.

DR. LAPIERRE: I would like to ask a question regarding the Coke Ovens Site.

You are contemplating removing a quantity of material from the coal tank area and you're going to incinerate that. Are you contemplating any other -- incinerating any other material from the Coke Ovens Site?

MR. GILLIS: I believe the reference that you made was to the removal of material in the Tar Cell?

DR. LAPIERRE: Tar -- yeah, Tar Cell.

MR. GILLIS: The Tar Cell is about 25,000 ---

DR. LAPIERRE: Right. That's correct.

MR. GILLIS: I'll ask Don Shosky to speak about the remainder of material.

MR. SHOSKY: Yes, there are some additional materials. Right now if we look at -- the

majority of the material will be moved from this area here where the Tar Cell is located and then there'll be -- as we talked on Saturday, if there are small pockets of tar that are outside that area that we encounter we'll pick those materials up as well, and then there's also the materials that'll be excavated out of the brooks.

About 1,300 to 1,500 tonnes of material will come out of the sediments in the brooks that will also be incinerated.

DR. LAPIERRE: So, will they be blended with the other material or just burnt independently?

MR. SHOSKY: Right now the plan would be to burn them independently. There's no reason that they couldn't be mixed, because they would go through that same feed stock process.

The feed stock criteria would not change between the two sites, but I would like to emphasize that these areas here do not contain PCBs and they're only PAH compounds, so ---

DR. LAPIERRE: But they could have a relatively high BTU content?

MR. SHOSKY: That's correct, and they would need to be cut or blended down before thermal incineration could occur.

DR. LAPIERRE: Thank you.

THE CHAIRPERSON: I would like to ask some questions returning to a subject that we did discuss yesterday, which is future use of the sites.

And I guess in general terms, what role did the consideration of future use of the two sites play in your assessment of remediation options?

MR. POTTER: The major criteria were health and ecological risks, and once we had addressed those, you know, essentially the future site use, you know, as we'd indicated, could be more than -- any type of passive land use or light industrial. You know, as I mentioned I think as well yesterday, the Municipal Planning Strategy does focus on those and not so much on residential.

So, really the main criteria, I guess, was the ecological and health risk aspects, and once that was addressed, you know, the use could be, you know, not endless but a variety of uses could be made of that property.

THE CHAIRPERSON: Um-hmm. I mean, in a case where you're looking at different remediation options and if remediation Option A were to deliver part or all of the site being completely clean with basically no restrictions on future use, am I to take it that that was not assessed, that was not, as it were, given extra

points?

In other words, I mean, I understand that from an ecological and health risk perspective arguably, you know, a containment and capping remediation severs the pathways and delivers the same result as a complete removal and destruction option, but the complete removal and destruction option would deliver a site that has no restrictions on future land use where the other one has considerable restrictions on land use. That's what I'm trying to get at.

MR. POTTER: Yes. I guess we have to go back to the MOA, that the project that we've been charged with implementing is the one based on the project description that started with the whole EIS and the first step of the EIS process, and that's based on, you know, the identified remediation approach where we are on the Coke Ovens, an environmentally contained system, management system on that site as well with, you know, the solidification and removal of the PCBs on the Tar Ponds.

So, that's -- essentially the starting point for us is, you know, the project as described and defined and funded through the MOA.

THE CHAIRPERSON: So, who should I be asking my question of? If you're saying that you -- at

the point that you started is where you were handed a certain set of criteria and you designed for that, is this a question I should take forward to Public Works and to, presumably, Public Works and the provincial body as well?

MR. POTTER: Yeah, I guess, you know, the best response is that the project was, you know, defined for us through a very exhaustive and extensive process, you know, prior to the current EA process which arrived at the -- you know, the selected cleanup project that we have currently before us.

So, you know, we can take it so far but, you know, there was decisions made arriving at the conclusion in the MOA.

THE CHAIRPERSON: But you're not suggesting who I should take my question to?

MR. POTTER: Well, there will be some of the funding partners appearing before the Panel.

THE CHAIRPERSON: Um-hmm.

MR. POTTER: They can address that as well, or address it further.

THE CHAIRPERSON: Um-hmm. All right. I was interested -- and I guess this is more of an observation than a question, but looking at your Table 2.13-2, which is the Summary of RAER(?) Options as

Alternatives to the Project, in fact, I think the title of the table is not quite totally descriptive. Sorry, I'll -- have you -- you've pulled that up? Yeah.

Because really it's the result of a total evaluation of all the options including the RAER(?) and the proposals that then became the project that we have before us but -- so that table has no mention of future use in it anywhere.

MR. GILLIS: That's correct.

THE CHAIRPERSON: Um-hmm. So, that reflects exactly what Mr. Potter is saying, that as far as the Agency is concerned future use as a way to pick between these options just was not on the table?

MR. POTTER: That's correct.

THE CHAIRPERSON: Well, still while we're in that -- no, I would like now to go over to Table 47.1 in IR-47. That's the information request where we came back again to ask for more information on the restrictions on future use.

I've just got a few questions with respect to the information you came back to us with. So, our question for the -- to enable the people who don't have this in front of them -- we came back with additional questions regarding future use and asked for the type of land use and development that could take place on

different parts of the two sites, the detailed deed restrictions that the Sydney Tar Ponds Agency would place on the land before deeding it to another party and to detail development restrictions that the Agency would recommend that CBRM enforce through land use and zoning. So, we were given a table with that information which is helpful.

I guess my first question is, can you tell me a bit more about deed restrictions. I don't know that much about deed restrictions. The deed restrictions you've suggested are with respect to things like water supply, that there be no wells, which makes obvious sense, and access right-of-ways and excavation depth, foundation type and depth, landscaping, below-grade structures, and contouring service, water management, below-grade site services.

How do deed restrictions work? You put them on a deed and every time the land changes hands the person will be advised that that's there, but then what happens? What if they go ahead and they forget or they do one of these things? How are those enforced?

MR. GILLIS: I'm by no means a specialist in deed restrictions, I can assure you.

The deed restrictions that I'm familiar with are those associated with flooding along the Saint

John River in New Brunswick and you go there at your risk and you go there at your peril. If you're in the flood zone which has been identified and defined, the deeds are very clear on that, and if you transfer a property to someone you're obligated to show the kinds of restrictions on land use that are there.

And I would see a similar thing carrying forward here where these are the uses that you can make of the properties and go forward with that.

Any use that you make of a property in a situation like this is subject to zoning, subject to land use controls by the Municipality, and the Municipality would, of course, be aware of any deed restrictions that are placed on the activities themselves. And that exhausts my understanding of deed restrictions.

THE CHAIRPERSON: Well, that's interesting because in the instance you've cited then the main purpose of that deed restriction is a liability issue, is to let the owner know that if they do certain things it's at their risk.

Now, in this case I don't think that's the purpose of the deed restrictions, is it? You don't want these people to go and do these things and assume the risk, you want them not to do them?

MR. POTTER: The purpose is a little

different in this case, it's to -- we have a managed site and if a future use is identified where we talk about light commercial property and a person acquires land to put a small warehouse up, he would have to understand that in putting up that warehouse he cannot impair or alter or somehow interrupt our management system.

If there's a -- if our depth of cover is such that he can't get to a certain depth, he's got to raise his building. If we have one of our drainage areas cutting through his area, he can't interfere with that drain.

That's the -- we tend to call them institutional controls, but they'd be restrictions that would be on his deed that he, again, as a landowner would know, "I have restrictions," and they would mirror what we see here in this table, that he'd be limited to what he could do, he'd have to modify his design to work around that, but it would be something he would know purchasing the property.

MR. GILLIS: The other comment I would make is that it would be similar to easements that you're granted, you know, along rights-of-way. For example, with a pipeline right-of-way or a transmission corridor you're allowed to do a certain number of things within that corridor but the deed very clearly says that you're

not allowed to do a range of others, and you accept those when you enter into the agreement with landowners.

THE CHAIRPERSON: And the enforcement of these restrictions is by what? That's what I don't understand about deed restrictions.

If I purchase some land from the province and I put something up and then I go ahead and do some of these things you don't -- that the deed has told me I can't do, what happens? Do you have to sue me?

MR. POTTER: We're getting near the extent of our legal expertise here, but I think it ties back to the -- you know, to the -- there'd be a deed restriction and then there'd be also a municipal permit required to -- you know, to do any alteration on that property.

And, again, this is where I think we're at the edge of our knowledge, but it's probably tied back to the -- you know, being zoned such that it had some zoning identifier on it that would indicate, okay, in that location there's certain things you have to follow, and their permit would -- their building permit would -- I suspect, would mirror that.

THE CHAIRPERSON: Well, perhaps we can pursue some of this with CBRM when they come, because they then become part of the -- they are required to enforce some key things to maintain the integrity of your

containment system.

So, I mean, what I'm getting at is really in the long haul can we be assured that these institutional -- these deed restrictions and institutional controls, in fact, can be effective.

MR. POTTER: We've had some initial discussions with CBRM dating back quite a few years now -- well, probably five or six perhaps -- but that's what they're looking to us from, that if there are going to be zoning or development restrictions suggested for these properties that we recede back to them and they would implement that or address it appropriately.

And, again, that's about as far as I can take that, but our initial discussions were that -- actually the request was suggested some time ago -- that there should be restrictions now and they -- you know, we said, "Well, we can't come back to you until we know what potential restrictions there should be," and they said, "Fine, when you get to that point come back to us" and that'll get incorporated into their planning strategy and development permits.

But they will, I believe -- I understand their planning group is coming at a future date, so ---

THE CHAIRPERSON: Um-hmm. I mean, some of these things that you would like not to happen on the

sites are going to be a little difficult, I would think, to -- and trees would be -- we understand that large areas of the two sites would not be able to support major tree growth. Therefore, you've somehow got to stop your -- in 10 years down the road you've got to ensure that if a landowner wants to plant a decent size tree that they -- any size tree -- that they have to follow these -- they have to do it as a raised planter or whatever, they're going to have to do something fairly costly and different, and those are not, I would have thought -- do you put that in a deed restriction and then how do you enforce that? It's a challenge, is it?

MR. POTTER: Not necessarily. I think we indicated on Saturday that any -- I mean, we will take the site to a suitably maintained and controlled situation.

Any future developer or user of that site would look at, you know, that property and whatever that chosen use would be. They'll have to decide that, well, if accompanying that use is 30-foot trees with rooting five feet deep they will bring in five feet of fill and they'll put in a tree or they'll do it via some kind of planter or something, but that's a consideration that the user would have to take into consideration, the primary focus being that they can't disrupt the cover material.

THE CHAIRPERSON: My point is that you've got to make that happen, you've got to control that, not immediately -- not only immediately the land changes the hands but five years down the road, 10 years down the road. This strikes me as being a challenge. Anyway, I won't belabour that point.

You do anticipate the land ownership will, in fact, change after the project is complete? Do you anticipate that the province would maintain ownership, would sell pieces of it, would give pieces away, would lease it?

MR. POTTER: I think for the purposes of, you know, what we're looking at here, we would have to assume that province will retain ownership until some potential use is identified for that land. It could be any of what you indicated. It could be a lease arrangement, it could be an outright purchase.

You know, it would be, I guess, speculative on our part to try to guess what that would be but, you know, we've tried to identify it as the restrictions that would have to be considered for that property whatever, you know, potential use may be made of it.

THE CHAIRPERSON: And what would happen with respect to liability?

Now, my understanding is that in terms of the redevelopment of brownfield sites -- and this is definitely a brownfield site -- that liability issues are always one of the big kind of institutional barriers or commercial or cost barriers really, and the EIS is just about silent on the issue of long-term liability.

MR. POTTER: I think, you know, the question of liability is recognized on brownfields.

We've not addressed it because we've not really -- we don't really have that mandate. Our responsibility is to bring the site to, you know, a safe engineered containment system where it's not causing any further on-site or off-site impacts and there is use -- as we identified, you know, some restrictions on the use, but primarily, you know, the uses that we've identified in the EIS.

We can't go beyond that. It's not something that we have, I guess, a mandate to or -- you know, I guess it could be a question asked of the Province who will be the future owner.

You know, recognizing that the Sydney Tar Ponds Agency probably has a finite life, we will carry out the work, complete the remediation work, a decision will be made at some point in time if the Agency continues as an owner/caretaker of the property or

whether it rolls into a provincial department that looks after parks and land holdings like that.

So, it's not something we can address right now, I guess.

MR. GILLIS: Maybe just ---

THE CHAIRPERSON: Well, it is -- I think it's a pertinent area for the environmental assessment because of the two stated objectives of the project.

And the first objective is to reduce the ecological and health risk posed by the site, and the second objective -- and there are just two objectives cited in the EIS, and the second one is to be essentially a socioeconomic and community well-being boost for Sydney and this is -- I understood, was fairly clearly tied to there being viable future uses on the site.

So, I am interested in pursuing issues and questions relating to the likelihood that, in fact, these kinds of future uses will be attractive to somebody who might want to build, whether that'll be financially viable or whether the costs incurred -- the costs involved in building on the site with the restrictions that you'll have to put on them will, in fact, make it not all that attractive especially in a situation where, you know, land values -- depending on what the surrounding land values are.

So, these -- I just want to give a little context on why the Panel would like to pursue these questions and I appreciate you saying that you feel that your mandate shuts off before then, but this is why we're asking the questions.

And the liability one would, I think, refer to, you know, who would retain the liability and would that become -- or would that transfer if land ownership were to transfer and would that become a disincentive to establish some of the land uses you're talking about.

So, I don't know whether that's -- you feel that you've said all you can say on this or if it's something you want to come back to us on.

MR. POTTER: I guess, again, sort of repeating the focus of the Agency, we're trying to address the liability that the land currently addresses in terms of its risks.

We'll take your thoughts and give it some further thought and perhaps come back with something additional, but at this point in time, you know, we don't feel we can address it any further, so ---

THE CHAIRPERSON: So, you have a project and an EIS with two objectives, and the second objective which appears to require that future uses become --

viable future uses become established on the site.

Should not the Agency be able to provide us with some assurances that those future uses will, in fact, be -- could be reasonably considered as being viable with respect to such things as the cost of developing, the risk of developing?

MR. GILLIS: I'll take one more shot at this.

To goal, as we've undertaken here, is to identify a project and do an environmental assessment of the project, that currently the risks are present that impede opportunities for future development. We are removing those risks to the opportunities for future development. There will still be limitations on future development as there are on any property, including location, including a whole variety of issues.

We feel that the remaining limitations on development can be managed in the context of managing the site from the engineering viewpoint, and if we haven't been clear about the kinds of land uses going forward maybe that's an issue, and where we may need more thought is on the kinds of potential deed restrictions or what have you going forward and the precise mechanisms of how to implement those, if that's what your question really is.

THE CHAIRPERSON: I don't think I'll keep pounding away at this but I will just ask one more, which I think is a straightforward question.

Well, I'm not saying that I won't come back, but right now the straightforward question, I think, which I really would like to have an answer to -- and if you come back with the answer that's fine -- it's just this question of who -- I recognize that your project is designed to reduce current liability significantly. I accept that that's the purpose of the project.

Nonetheless, there will be some -- it's a containment solution, so there's still some remaining liability, and I would just like to know who will retain that liability should the property change hands, whether it change hands conceivably from provincial ownership to municipal ownership or if it would change hands into private ownership.

Just if you can give me some -- get somebody to give me some sense of who retains the liability, does the liability move with the ownership of the land, or how is that dealt with. So, feel free to come back.

It's 5 to 5:00 and maybe that would be a good time -- a good point at which to stop. So, thank

you very much. So, we will now take a one-hour break and we will resume again at 6 o'clock this evening.

--- Upon recessing at 4:55 p.m.

--- Upon resuming at 6:03 p.m.

THE CHAIRPERSON: Well, good evening. I would like to start the evening session off. And my first suggestion to the Sydney Tar Pond Agency, or not suggestion but I was going to offer you a little trade-off, if you might be interested in that. It's one of the sort of net present value things. Would shortening this evening be worth a few more hours later on is the question? Anyway, the suggestion is, I think the panel would like to probably not be going till 9 o'clock this evening, I think we will probably end closer to 8 o'clock, maybe even before, we'll see, but we won't be going till 9:00.

However, we think it could be very useful for our understanding of the project and the environmental assessment if we had one more chance to pose questions to the proponent after we've heard presentations from the other participants in this process. So we would -- I would like to suggest to you, and you don't have to say yea or nay right now but you can discuss this with the secretaries afterwards, but what we're suggesting is an additional session on Tuesday afternoon, May 16th, from 1:00 till 4:00, and that that would be a chance for us to kind of come back and wrap up some things with questions that may have occurred after

listening to other presenters. So if you'd like to take that under advisement.

MR. POTTER: We'd be fine with that. I think that'll be no problem at all, we'll give you the hour tonight. We will trade you off one supper, though, because I've learned that if you do interviews when you step out of the room they eat all the food on you! I get no respect around here.

THE CHAIRPERSON: All right. That's very good.

MR. POTTER: Madam Chair, could I just get back to one point. Just as we were closing on the long-term ownership and maintenance of the property, I guess I'd like to draw to your attention to section 1.8 of the MOA, and I'll just read part of it that refers to the completion of the work:

> "Nova Scotia shall accept full ownership of the sites except in the event any...third party claims or interest therein have been established, and shall be responsible for any contemplated future development and any future impact to or on the sites of such development, as well as for all ongoing future

maintenance and monitoring of the sites."

Maybe that might be a good focus point when the province, through Transportation and Public Works comes before the panel.

THE CHAIRPERSON: Yes, thank you, that's helpful.

DR. LAPIERRE: Good evening. A few more questions.

The first question I would like to address regards the cancer criteria used in the Human Health Risk Assessment, and I believe you used a 10 to the minus 5. The first question was why was this criteria selected, 10 to the minus 5, I guess, versus 10 to the minus 6?

MR. POTTER: I'll ask Dr. Magee, he's our health risk specialist, to respond to that.

DR. MAGEE: 10 to the minus 5, which is one additional excess cancer case over a lifetime out of 100,000 people, is the project significance level, as you have suggested, and it is the level that's used routinely by Health Canada and by Nova Scotia government. So we're just following along with the regs and doing it the way the regulators normally do it.

DR. LAPIERRE: Okay. So you just harmonized your answers with the provincial ---

DR. MAGEE: Health Canada and the province, yes.

DR. LAPIERRE: Thank you.

The next question relates to the incinerator. I guess in IR-49 you did provide a fairly lengthy answer to the question that relates to incinerators. Technology exists that can meet an emission criteria of 1.1 microgram per cubic metre. I guess the -- you gave a fairly lengthy answer. However, I don't think we got an answer to the question how feasible is the technology to monitor that?

MR. GILLIS: So the question is, is not only the emission rate but you're interested in the monitoring technologies to understand that.

DR. LAPIERRE: Yes, I guess to ensure compliance.

MR. GILLIS: Yes, okay. Thank you. I'll ask Dr. John Walker to address that issue.

DR. WALKER: You're quite correct, mercury, at the levels we're talking about is quite difficult to monitor. Mercury is a hot topic all across North America. It's in all coal plant emissions, and, for that reason, there's been a lot of development work being done on close to real time mercury monitoring, but it's not there yet, not at these levels. These are the

kind of levels that would have to be determined by doing some source testing, and the same sort of source testing we have to do for PCBs and dioxins because the trace levels are so low.

The sampling train that's for this is quite similar to one that is used for ordinary particulate metals, except there's a potassium permanganate trap to take the mercury out of the air stream. And so that's when it would be done.

The control technology using carbon injection is, however, because of the interest in mercury in the last few years, becoming much better developed.

DR. LAPIERRE: If I understand correctly you would have to work to try to get that level of detail.

DR. WALKER: Yes, I think there's no question that during the acceptance compliance testing for the incinerator there would be a full suite of source testing, and that source testing we anticipate would include dioxins, PCBs, PAH and mercury and other trace -- other metals and particulate speciation, the PM 2.5, PM 10 and so on.

DR. LAPIERRE: Okay. The other question is more of a general question, but it's one that kind of intrigues me a bit, is if -- you seem to be very

concerned with the integrity of your cap to eliminate surface water from the monolith. However, the monolith will be bathing in water at the bottom end. Why such a concern for the top?

MR. GILLIS: So the question is pretty fundamental, why are we spending so much time worrying about the water coming down from the surface.

DR. LAPIERRE: Time, money and a whole lot of things.

MR. GILLIS: Okay. I'll ask Don Shosky to address that issue.

MR. SHOSKY: I'm going to have them go ahead and put the cap design back up again so we have a visual we can talk with.

MR. GILLIS: Madam Chair, maybe if we can get those spotlights again, they seem to be the worst ones for the screen, those ones directly overhead.

DR. LAPIERRE: Those are the heating lights for ---

MR. SHOSKY: Again, we have, to refresh everyone's memory, or who wasn't here earlier today, the cap in the Tar Ponds area consists of a clay layer, a DCL, the monolith, and then an underlying geologic structure that potentially can have water come from the bottom up through the top -- up to the top. And the

question is why don't we have the same care or concern over this bottom section that we do on top.

The reason why it's designed this way with the relief again is that this bottom layer has -- will be -- or the stabilized matrix will have a hydraulic conductivity which is two orders of magnitude less than the underlying geologic formation that would be feeding water into it. We are predicting that through preferential flow these items here will be used to relieve that pressure, and, as a result of that, we don't feel that water will infiltrate much up into the -- up into that monolith because of the low hydraulic conductivity that we have.

If we go to the channel diagram, I think it's ---

DR. LAPIERRE: Could I just ask another question here. If that's the case, are you not concerned -- you only have a meter or so of oak burn in your layer -- that you might get some severe tar action at the edge of that meter?

MR. SHOSKY: This bottom?

DR. LAPIERRE: Yes, right on top of there, on top of your well. The water's going to go up through there, and you presumably might have fresh water on top of saltwater.

MR. SHOSKY: At this layer here, which is the darker green layer that represents the GCL area, that should keep the -- or I'm confident that it will keep the water -- once the water enters this trench, the GCL will act as a cap which will further not allow the water to infiltrate up past that into the upper layers of the cap, for several reasons. One is the porous stone that will be used in the trench, which will have a permeability or a hydraulic conductivity of about 10 to the minus 3, will then come into contact with something that has a permeability of 10 to the minus 9, which, in effect, acts as another cap on top of that drain, thus prohibiting it from infiltrating up further into the cap beyond this area that's depicted with the darker colour. And I believe that that is below the frost line.

However, I did say Saturday we were going to do more investigations on the frost penetration thicknesses in association with the cap designs to ensure that the upper tan area, which is the compacted clay material, would be of sufficient thickness to not be a problem from a freeze/thaw perspective.

DR. LAPIERRE: Okay.

THE CHAIRPERSON: Can I just ask -- I wasn't going to ask this but you've got the diagram up there, this is just for my clarification. Can you just

point out where those -- the T parts of the drainage system are.

MR. SHOSKY: Can you go to the previous slide with the drainage cross-sections. The cross-section we just looked at of drains was this side view here looking at it. So if -- don't do it, but if we go back to the previous slide, those trenches would be going back towards the back wall with the T towards the back wall according to the way the cross-section right here was made up.

THE CHAIRPERSON: But the T is the height -- the T is at the top just underneath the cap?

MR. SHOSKY: Just underneath the GCL layer, so it will capture just the shallow water.

THE CHAIRPERSON: Thank you.

MR. CHARLES: Back to the incinerator for the last time, I think, tonight, but I'm just wondering, some of the incinerators that have been given on our table, and those operating in the US Navy, subject to slightly different climatic conditions than we have here, I'm thinking particularly about winter conditions, do you foresee any problems with severe cold weather, for example, or icy rain or anything else that might cause the operation to be more difficult with, you know, cracked valves or pipes that burst or that sort of thing?

Is this considered to be sort of a difficult environment in which to have an incinerator operate? And I know you're handling one at Goose Bay, but we don't know very much about how that one works.

MR. SHOSKY: Well, I've had the unfortunate experience one time from taking an incinerator from California to upstate New York that wasn't winterized, and we had exactly those types of problems where we would have frozen water along lines and things of that nature. Properly winterized, which is what we ended up doing with that incinerator once it got to upstate New York, it operated fine from the weather conditions. Certainly caution needs to be taken in order to make sure that people that are coming here know that they're working in adverse conditions.

There are some issues more problematic associated with wet scrubbing systems. The drier the cleaning systems are for the emissions, bag-houses and things of that nature, the less likely that you'll have problems with freezing, but it's definitely a concern of mine. And during the detailed engineering portion of the project, that would be something that would have to be looked at in a lot of detail, because you don't want somebody up here not familiar with the climatic conditions that are going to be there.

MR. CHARLES: That's even allowing for global warming.

Another question I have is this. As a panel, and of course I know it's not your fault necessarily but we've had difficulty, because many of the details about the project, and how it's going to operate, are sort of put off until the final detailed design, and so it's hard to get a handle on the exact project when some of the details you don't know anything about. But we'll overcome that.

My concern is with public scrutiny. How will the public get to know the full impact of the project when a lot of the detailed work is going to be put off to a later date in the more later final design phase? Are there steps going to be taken to provide for that?

MR. GILLIS: That's really not an unusual situation for environmental assessment. You're generally pretty early on in the planning stages because your decisions have not been finalized about going forward with it. So the engineers are, in a lot of cases, very reluctant to finalize all the designs. So you end up going forward with a conceptual design, and at the end of the day what we, as assessment practitioners, end up doing is setting design criteria for the design

engineers. And it's those criteria that you need to really evaluate and adjudicate in looking and saying, well, first of all, do we think we have confidence in the engineering practices that they can meet these criteria? And secondly, will the criteria themselves afford sufficient level of protection as we would go through in doing conduct of the environmental assessment itself.

So I understand what you're saying, but again it's -- beyond the concept stage a lot of times it's very difficult to go very much further.

MR. CHARLES: Yeah, but my concern is once you go that further step, how is anybody going to know what that final design is going to be?

MR. GILLIS: Well, there will be a communication ---

MR. CHARLES: Will there be a publication of some sort, will there be information provided, that sort of thing?

MR. GILLIS: And the Sydney Tar Ponds Agency can speak to this, but the projects that I'm familiar with, and this one I have no reason to suspect otherwise, that there'll be a full information series going forward with the project to make sure that stakeholders understand where the project is and, at the end of the day, what the project is that meet the

criteria that have been assessed in the EIS.

MR. CHARLES: Will you have sort of a public unveiling of the final project and say "Here it is"?

MR. GILLIS: I guess yes and no. Long before that we'll be consulting with the community on a regular basis as we progress through the various detailed design stages and the associated regulatory requirements we have to meet. Likewise, we would keep information on our website. We make an effort of keeping our website as accurate -- as updated and fresh as we can.

You know, we've had open houses where we've provided the key milestones, you know, open houses where people can come and see where we're at at the various stages on the project. So it will be a multitude of opportunities for the public to input into the process. It won't be just a matter of us coming out at the end of the day with "Here's the final design. Here's the permit. We're starting next Tuesday."

MR. CHARLES: So there'd be opportunity for input.

MR. GILLIS: That is correct.

MR. CHARLES: Final question and it relates to health really. We talked this afternoon about some of the health risk assessments and how the worst

case scenarios were depicted in terms of the young toddler who eats carloads of fish out of Grand Lake, and how the model was designed to account for that and was very conservative in that respect.

I guess my question is, and there have been some comments and this is the reason I raise it -- there have been some concerns and comments about adults in the community, not toddlers but adults, who have health problems of one sort and another -- is it your intent, and is it your confidence, that the risk assessment that you have provided in the modelling which covers your young toddler, would that also protect the more adult people who have health problems?

MR. GILLIS: I'll turn that question over to Dr. Brian Magee.

DR. MAGEE: Yes, absolutely. We have -- in our Risk Assessment Report we always do the toddler and the adult. I know from experience that for non-cancer, the toddler always gives the higher answer, so if you pass for the toddler, as it were, you always pass for the adult, and that is true here.

For cancer, it really depends on the specifics. In this particular case, the toddler also is more sensitive, even though they're just getting a few years of exposure, because of the specific list of Health

Canada assumptions that we have assumed. So we do have the result for the adult. They're all lower, so there are higher margins of safety between ariens(?) and the project significance level for the adults. So yes, I'm quite confident.

MR. CHARLES: Thank you very much.

THE CHAIRPERSON: I'd like to ask a question with respect to IR-63, odours.

In this response, you've provided monitoring results -- the question, sorry, in the original request from the panel was:

> "To identify sources of other potentially significant odours in the Tar Ponds other than VOCs, and to identify commercial and residential areas that are within 100 metres of Tar Pond sediment disturbance areas."

There'd been an indication in the EIS that -- basically on an anecdotal basis, but that significant odours have been restricted to a distance of about 100 metres from the area of sediment disturbance.

I'm noting that the south pond has received and impounded untreated sewage, and the panel was interested to know what kind of odour problems might

result once those sediments stop being disturbed.

Anyway, in your response, you provided information on monitoring that was done for -- in 2005 you did a test dig, and then you did -- you monitored the results of that test dig looking for any of 10 different sulphur compounds that might be responsible for odour, and you say here:

> "Based on these results, modelling was not required to evaluate the odour thresholds of these additional compounds."

Now, in the table, Table IR-63.1, Sulphur Compounds Measured during Field Experiment, the detection limits, can you tell me what the relationship of those detection limits shown in that table are to what the human nose can detect? Are they the same or are they different?

MR. GILLIS: We -- just based on a quick conversation here, we would prefer to take this as an undertaking and get back to you with that specific answer.

THE CHAIRPERSON: Okay. Perhaps I could just ask the -- what you were using to do the monitoring was some sort of test or monitoring device or meter or something, was it?

MR. GILLIS: I'll ask, just if I can, Dr. Magee here to just outline what precisely he did do and how the test was done, which may be of assistance.

THE CHAIRPERSON: Yes.

DR. MAGEE: We went to Ferry Street which, of course, is the road that leads up to the bridge that separates the north and the south pond, and we took a long arm excavator, one of these big pieces of yellow equipment that you can imagine might be used for this process, and staked out an area that would be about how much we thought might be dug in a single day. We put a whole series of monitors around the test excavation actually in the Tar Ponds. We had people walk out and put various devices in four different directions so that we could make sure that we caught downwind regardless of what might happen during the course of that afternoon.

We also had Summa canisters, which are these evacuated stainless steel devices that collect air for analysis. Those were a little further away. We also used Tedlar bags, which are relevant to this particular table. Those are single samples that you take over the course of a few minutes. We did that during a peak period. Those got sent off for the sulphur analysis.

Let me ask my colleague if I've left out something that we monitored. Oh, and there was lightning

during that day but that doesn't, I don't think, change the nature of all the samples that we got. We probably sent off, let's see, maybe 50 samples to the laboratory over the course of that afternoon, all done in the laboratory.

So no real -- oh, I take it back. We did real time monitoring, as well, with the standard photoionization detector. That's the device that you can actually walk around and get the reading on the meter. We had several people with those devices also going around a downwind location, following the wind, as it were. When the wind shifted a little bit, we sent them to the downwind location.

THE CHAIRPERSON: So you will now come back later on and tell us whether, in fact, these detection limits that are shown in this table, because everything was below detection limits, whether that's equivalent to what the human nose can smell. I mean, anecdotally, could you smell what was going on when you did the testing?

DR. MAGEE: Well, I can certainly respond to that. I've been to the site quite a few times, and have never smelled anything, although I'd heard quite a few stories about how smells can be detected from time to time, and I'm sure they can be from time to time.

I was standing when we started quite close, before we got under way, and the people that didn't have protective gear had to move a certain number of feet away. We certainly did not detect but just a trace of odour during the entire course of that afternoon, and that was only when one was very close, I would say maybe 20 feet.

Certainly when you got 100 feet away, we had devices that measured no or detected no chemicals that would give odour, and we were standing at the proper location 100 feet away and we detected no odour.

THE CHAIRPERSON: Were you surprised, given the amount of sewage that has gone in there?

DR. MAGEE: Quite frankly, I was surprised that we didn't smell but just a trace.

THE CHAIRPERSON: Okay. Well thank you.

MR. POTTER: Just if I could clarify that a little bit about the sewage. The treatment had gone on -- the Battery Point Treatment Plant for Sewage had come on stream July 4th, so your date, Brian, was mid-August, so almost a month and a half that there was no fresh sewage going in, but there would have been, no doubt, some trace sewage in the ponds, but there was no new input at that point in time.

Last summer, for residents of Sydney

you'll probably know, that we didn't have the odour that traditionally we do get through that warm summer period that is associated with the sewage.

THE CHAIRPERSON: So in your experience, the odour is more associated with fresh sewage than it is with the old sediments?

MR. POTTER: Our understanding of what happens, about mid-June, when the oxygen levels, in the south pond especially, are depleted, it turns anaerobic, and there is a very sharp and very distinct point in time when suddenly the ponds are -- you know, one day it's not noticeable, and the next day it's very strong. That's typically what happens. That will carry right through till about up to mid-September. If we do get a heavy rain period and there's a large flushing, the odour will disappear, but if it's a traditionally dry summer, mid-June to mid-September you're going to have that odour there.

DR. LAPIERRE: I'd like to ask -- come back to the question on the modelling, I guess as it relates to bio-accumulation or biological activity at depth.

You know, if one goes back and you look when your monolith is in place, you're still going to be left with soil that has some PCBs, you're going to tell

us how much, and you're going to have some PAHs that are left, and other chemicals. I guess my question goes to the fact of bio-accumulation.

I think in the EIS you indicated that bio-accumulation at depth had been excluded from the modelling because there wouldn't be any activity at depth.

Now, if you look at the information we got yesterday on the organic content of the material that you have, and you're certainly going to stir some of that material up, you're going to have some salt water that intrudes from the ocean, it will certainly bring in some oxygen, and I guess my question is two-fold.

First of all, will there be biological activities under the monolith, and will it continue at depth, and I guess the statement that you made in the EIS it wouldn't -- you had excluded it from modelling because it wouldn't happen, it was too anorexic -- do you have scientific data to support that statement that activities do not take place in anorexic environment?

MR. GILLIS: So just so that I'm clear, the question is, given the presence of organic material which may act as a nutrient source, perhaps some exchange of salt water, which we could talk about a little bit later, and given some -- because of the sea water

exchange potentially some oxygen, what is the potential for biological activity and hence the accumulation.

DR. LAPIERRE: That's one part.

MR. GILLIS: Okay, part 1.

DR. LAPIERRE: The second part is at depth.

MR. GILLIS: Okay. I'll ask Dr. Malcolm Stephenson to address this, if you would.

DR. STEPHENSON: Thank you. Certainly, microbial activity will happen, it happens all over the face of the earth. It happens to quite a considerable depth in the geosphere in groundwater flow paths and so on. So certainly there will be microbial activity underneath the monolith. That microbial activity can proceed usually at a very slow rates in the absence of oxygen. It's typically much faster, because what we're looking at is compound essentially that require to be oxidized, and oxygen is the preferred chemical that, I guess, participates in those microbial reactions.

Microbes can also get sources of oxidizing agents from other chemicals such as sulphate that are present in the water as well. So those things can continue, even in the absence of free oxygen.

I think the important thing that we want to emphasize is the fact that we've got microbial

activity in the groundwater and in the tills underneath the monolith really is not that big of an issue. What those microbes will be doing is very slowly breaking down small amounts of the contaminants, the organic contaminants. More importantly, though, there really is no pathway that will allow those microbes direct access to the surface, and there's nothing that we're really that concerned about as ecological receptors that will be going down and feeding on those microbes.

DR. LAPIERRE: So if salt water comes in, could salt water not also leave the site and could it not carry some of the microbes with it?

DR. STEPHENSON: Well, there I think you're talking about during the actual physical stirring of stabilizing materials, concrete, into the sediments themselves?

MR. GILLIS: Perhaps I can get Don Shosky to talk a little bit about the potential for gas generation in the monolith itself, which would be a reflection of microbial activity such as you're describing, I believe. So Don, can you ---

MR. SHOSKY: I'd like to add a little bit of clarification on this based on my own personal experience.

There will be -- outside of the monolith

area, there'll be microbial activity that potentially could occur, but within the monolith itself, it will be extremely limited because of the drastic PH change that occurs when we add the concrete in with that material. By changing the PH of the sediments from something that's neutral to a PH of 10, a lot of the bacteria die off at that point, and, as a result of that, you don't have the same conditions that you would get like we discussed on Saturday with the composting operation where you need air and water and nutrients in order to get the biological activity to occur.

In the monolith scenario, you're missing several of those key components to keep life in a bacterial form sustained. For example, a higher PH, you'll have pure adaptable bacteria for that, and you will also not get the nutrients that you need readily available after the material's been cemented. And you do not have the same rate of air exchange that you would in a normal composting operation where you would expect to get a large amount of gas generated. That's the conditions as I understand it that would occur within a monolith.

I've had a number of sites that I've worked on where that has been the case. As soon as that PH changes, a lot of the microbes die off, plus we have a

heated reaction that occurs when the cement is added that also, in effect, because of the temperature change, also decreases the amount of microbial population within the monolith.

So, in my professional opinion, I do not believe we will have an issue with gases generated from this monolith over time.

DR. LAPIERRE: I agree with the monolith, but underneath the monolith there's still going to be some silt. You're going -- or are you going down to till?

MR. SHOSKY: That is correct.

DR. LAPIERRE: In the till will there not be any organic matter or clay matter left?

MR. SHOSKY: Whatever is naturally occurring in that till will be there and as was just explained by my colleague, it is possible that those conditions won't change at depth, but that is a condition that we're not really changing in the microbial sense.

DR. LAPIERRE: So microbes could still be there.

MR. SHOSKY: That's correct.

DR. LAPIERRE: Then my question is, if you've got an exchange with the salt water in the harbour, can that not be a conduit for these microbes to

migrate from the harbour -- from underneath the monolith to the harbour?

MR. SHOSKY: It's my understanding that that may well happen in the till layer, but that's not where the contaminants are, if that's the concern for bio-accumulation. And Malcolm -- Dr. Stephenson can ---

DR. STEPHENSON: I think there are two scenarios that you're talking about. One is during the actual remediation operation where the stabilizers are being mixed with the sediments, and that operation, as much as possible, is going to be effectively done in the dry or in a semi-dry state, and there will be mitigation in place to prevent free liquid from leaving the site and going into the harbour. That's a given.

The other scenario is basically groundwater flow, after mitigation has taken place over the next 20, 50 years, whatever, groundwater flowing through the till in the direction of the harbour and, as I think the majority of us probably appreciate, groundwater actually is a very good natural filter, and -- or the process of water moving through the ground is a very good natural filter. So what I would expect to see would be potentially movement of water through the materials under the monolith, but not necessarily a whole lot of movement of microbes.

Microbial activity is most typically associated with bio-films, and those bio-films themselves are actually attached to the surfaces, and it's bio-films on surfaces that give you the majority of the microbial activity in groundwater flow paths.

MR. GILLIS: So, the potential for bio-accumulation of the materials that are locked into the monolith is extremely low or is nonexistent virtually.

DR. LAPIERRE: Okay, I accept that, but are you certain that all of the chemicals that are left will be tied up in the monolith?

MR. GILLIS: I'll ask Mr. Shosky to speak to that.

MR. SHOSKY: Based on the number of coal tar sites I've worked on where we've used this technique on numerous occasions, as I indicated on Saturday, I believe that these compounds will be tied up in the -- in the cement monolith matrix for a couple of reasons. The contaminants that we're concerned about are typically pretty long -- large compounds, and just as a general rule of thumb, the larger the compound, the more affinity they have for collecting onto finer particles and staying immobile. And through the process of generating this monolith or creating this monolith and decreasing the permeability down to the low levels that we have infers

that we have a lot of small particles there that gives a lot of availability for these chemicals to be bound up in, and I'm very convinced that we won't see a problem with this monolith or leaking of chemicals over the extended period of time.

DR. LAPIERRE: So you're quite confident that the monolith will not break down.

MR. SHOSKY: I am confident that the monolith will not break down and that there are safety measures on top of that that will ensure that there won't be a problem over time.

MR. CHARLES: This will be my final question for the evening. On page 2-81, there is a sort of a summary of the evaluation that was gone through by the proponent and government regulators and so on who reviewed the RAER options, who considered other options for remediation. And then on page 81, there are some key findings.

I'm interested in bullet No. 7. It's not numbered that way, but if you count down, it's No. 7. It says:

> "From the perspective of ecological and human health [or sorry] human risk, there are no appreciable differences among the remediation options considered."

And I know the remediation options vary a fair amount, and I'm wondering if this is still the opinion and how you would expand on that. I'd kind of like a little further explanation of how you're able to arrive at that particular conclusion. It seems to say to me it doesn't make any difference which option you choose or what you do, the risks are all going to be the same.

MR. GILLIS: If you'd just give us a moment while we bring this up.

MR. DUNCAN: Just to -- while folks are turning up that page, just to clarify, this is a representation of key findings that come from the RAER Report, as indicated, the Remedial Action Evaluation Report, completed, I believe, in 2003. And these are the findings of that study. They're just -- they're replicated here in the EIS for completeness. Perhaps Mr. Kaiser could speak to the RAER Report specifically and talk about those specific findings and how they relate to the various options.

MR. CHARLES: I may have misunderstood. I may have read it incorrectly. What I thought it was was a review of the conclusions and the findings of the group that got together afterwards and reviewed the RAER recommendations and options, came up with new options and assessed all options, the RAER options plus the new ones.

So it wasn't just RAER that they were talking about.

I don't need an answer right away, but if you'd like to have further discussion about this, I'm just interested in how -- I know it says there are no substantial differences. It doesn't say they were all exactly the same. But I'd be interested in knowing how you're able to arrive at that conclusion, because some of the alternatives seem to think that at least they had human risks and ecological risks that were less severe than some of the other options.

MR. DUNCAN: I believe you're correct, and I was mistaken. These are key findings, not necessarily linked to the RAER. But what we'd like to do is just take an opportunity to see where these key findings were from. They are replicated here from another source, so we just want to make sure ---

MR. CHARLES: Yeah. I realize you don't have it right at hand, but I'd be interested in getting a bit better explanation of it.[u] That's all.

MR. DUNCAN: Absolutely. Sure.

THE CHAIRPERSON: I'd like to get a little bit more information about the possible landfill on the Coke Ovens site, as in what's the likelihood of there being a landfill there, what criteria will determine what goes into it, how it will be constructed, what the

implications of it is for -- dare I say the words -- future use. It's a fairly large area that's shown, or it seems that way with the purple outline. So just generally if you could give me some more information about what might end up going in there and what you think the chances are of there actually being a landfill site there.

MR. GILLIS: I believe Don Shosky referred to that in his presentation of -- I believe it was Saturday. And he can speak to that now.

MR. SHOSKY: Yes. That area -- and Dr. LaPierre, excuse me if I point here. For the audience, the area that we're talking about is this purple area here. In our evaluation of the various materials that we may come into contact during the course of this clean-up, we found that there may be some materials that will be better suited for cleaning and decontamination of them rather than trying to take them and put them back in the monolith or haul them to an off-site location.

The types of items that we would be looking at to go into that possible landfill location would be large pieces of debris, rocks, wood, that would all be cleaned. The requirements for the cap would be just a soil cover, which is common to most nonhazardous waste landfills in Nova Scotia, and we have an -- we

don't have quite yet the exact footprint of what we think the size of that may be because there will be a percentage of materials that would go in there that we have to look at in further detail.

Right now we're anticipating that there will be one there. It could range from -- to be as high as 10,000 to 15,000 cubic metres of material, which is our best estimate at this point in time. It would have a footprint associated with it that would correlate with the depth of the fill and an appropriate soil cover on top.

The problems with redevelopment of that area in the future would just be similar to any other type of landfill material that you would have, is that we would need to make sure that the land use that was placed on top of it would not require a real robust -- robust geo-technical characteristics, because since we'll be putting pieces of debris in there, there's a potential for some void spaces which would have to be filled. Typically those spaces occur over the first one or two years of the operating life, so there would have to be some patching and maintaining of that the first couple of years. But at the end of the day, you could plant trees and grass and a variety of different plants on it.

THE CHAIRPERSON: The label says "possible

landfill location." That means the "possible" is applied to the location or to the word, "landfill"? I mean, are you pretty certain that you will have to have a landfill?

MR. SHOSKY: Yes. And the landfill, again, would be a nonhazardous debris landfill of clean material. And from our initial investigations, that's the most probable location. What would change the most is the actual footprint of the cell itself. So there's some further investigations that need to be done there in order to verify the length and width and depth of the potential landfill there.

THE CHAIRPERSON: And where does the decontamination take place and -- so what kind of process is that?

MR. SHOSKY: It would be a hot water steam cleaning operation. We have -- those facilities are already established at the site now, and there'll be a few more constructed, so that the site will be maintained clean for truck traffic and debris during the course of the works out there.

THE CHAIRPERSON: And the materials that you screen at the -- out of the feed stock at the incinerator, you said that you'd set the limit at about two inches?

MR. SHOSKY: Yes.

THE CHAIRPERSON: Would the -- would you anticipate that the smaller stuff would end up going there, or where would that go?

MR. SHOSKY: That material that would be oversized of two inches, one of two things could be done with it, and the final decision hasn't been made on which direction that would go. One would be that we would go through a cleaning process where those larger than two-inch cobbles and stones would be cleaned with a hot water surfactant type of rinse, tested, and then placed in that landfill. Or potentially the other option is to crush all the material to below two inches and just basically thermally treat all of it. The final decision on that has not been decided upon yet.

THE CHAIRPERSON: Okay. Thank you. Well, monitoring. Monitoring and maintenance. I guess my question -- first question is about the cap. What kind of monitoring -- I believe I read that you would be doing an annual inspection of the cap, or the caps, both caps. But anyway, could you talk a bit more about how do you monitor the integrity of both of those caps? How would you know -- what is the most likely occurrence that could imperil the integrity of either of the caps? And if it's something that's going to happen below the topsoil layer -- unless it's something drastic like a big hole appears

which anyone can see -- but if it's something that's happening -- might be happening below the topsoil layer, how do you know? And what kind of routine maintenance would you be doing on both the caps?

MR. GILLIS: So with respect to the operation of the site and the control over it and monitoring, again I'll ask Don Shosky to address that.

MR. SHOSKY: Thanks, Mr. Gillis. There's two things here. One is, for the benefit of the audience for tonight, I'd like to go ahead and go through a brief explanation of that, but I would also like to take it as an undertaking for tomorrow when we meet, at the beginning, to give you a more comprehensive list. We have some developed, but I'd like to make sure that it's all inclusive at the time I give it to you. But since some of these people will not be here tomorrow, if it's alright with you, Madame Chairperson, that I do that, I'd be happy with that.

THE CHAIRPERSON: Sorry, a comprehensive list of ---

MR. SHOSKY: Monitoring activities.

THE CHAIRPERSON: Oh. Beyond the cap?

MR. SHOSKY: No. For ---

THE CHAIRPERSON: Or more than the cap?

MR. SHOSKY: For the cap ---

THE CHAIRPERSON: We're still talking specifically about the cap.

MR. SHOSKY: Yes. We're still talking specifically about the cap, but there's a number of different areas that need to be monitored there and the various techniques, and I'd like to be able to give you a comprehensive list for those.[u] I'm willing to, at this point, explain to you for the benefit of the audience some of those items because some of them may not be here tomorrow.

THE CHAIRPERSON: Well, yes, that would be great. We'll take the shorter version today. And the timing of -- well, the timing of all -- of all the undertakings in terms of when it's most appropriate to bring it back, maybe it's something you can talk with the secretariat about in terms of how much time we take at the beginning of each session and when is most appropriate. So yes, thank you. I'd like to hear for now what you have to say.

MR. SHOSKY: Give me a moment to have the Tar Ponds cap presented again.

Okay. We'll start with the Tar Ponds cap, and this is a familiar cross section at this point, so we can see that these areas are all in place. And over the course of time while this is being constructed, there'll

be a lot of insurances to take place that it's installed properly.

As we discussed earlier, some of the -- some of the key components to monitoring this over time is the water quality that comes out of these particular trenches to ensure that the ground water is still clean, that we're not leaking anything out of the monolith into the aquifers that could be affected. The ground water quality from these areas will be looked at.

And as Madame Chairperson said, if there's any deep holes or divots that occur because of settlement that would occur, those would all be visually looked at, patched and maintained.

There's also erosion control that would need to take place on the site. For example, we would need to make sure that this grass is maintained, so that would be a visual inspection. There are, in association with -- and I'll go to the map over here -- there's quite a number of areas where we'll have to maintain silt curtains, silting devices to ensure that we don't have any silt that's running down from any of the active works. That'll occur in both capping scenarios.

And as within the Coke Ovens site, as with the Tar Ponds site, we will monitor the vegetation cover, depressed areas where subsidence may have occurred.

We'll also be looking for sheets* in both areas in case, for some reason, there may have been a flaw in the way that materials were laid down or the site constructed to ensure that any obvious leaking of the containment system would be visually identified.

We don't anticipate long-term air monitoring once the caps are down, because as stated earlier, we really won't be in a situation where we should have any gaseous emissions.

As far as the proposed nonhazardous landfill up here, again, the primary issue of concern there would be erosion issues of the soil cover and also the vegetation cover.

And in both cases, as we said earlier, ground water will be monitored here. The combination of ground water and surface monitoring would be done in the Coke Ovens site.

With that, that's the short version. We'll bring a longer version in tomorrow.

THE CHAIRPERSON: Thank you very much. I think we'll be very interested ---

MR. CHARLES: Can I ask a question?

THE CHAIRPERSON: --- to see the longer version. Yes, go ahead.

MR. CHARLES: Dr. Shosky, you have talked

about the monitoring, and I realize that during the operational phase, say, the 10 -- there's 10 years -- you'll be looking to see how things are working, and then there's a period after that where you'll still be doing monitoring. I guess my question is, whether you've got it outlined yet in a monitoring plan or not, on the basis of your own experience, how often would you monitor a cap like that? Would it be continuous monitoring for some purposes and sort of periodic monitoring for other purposes?

MR. SHOSKY: In fact, we have developed a plan, and we have certain types of frequencies for certain different activities.

For example, in the early portion of the development of the site, erosion control and maintaining your structures is extremely important. So until the vegetation is established, we'll have very frequent, once weekly, during the growing season, inspection of all silt control measures, for example, to make sure that there is a suitable vegetative growth, so that we're not having a silting problem or a erosion problem in any of these areas. Ground water monitoring would occur probably quarterly for the first couple of years, and then depending on the results, be stepped back over time. But we've developed a pretty thorough listing of activities

associated with that sort of monitoring.

MR. CHARLES: Is that the listing we're going to get sometime tomorrow or otherwise?

MR. SHOSKY: Yes.

MR. CHARLES: Thank you.

THE CHAIRPERSON: I'd just like to say that will really be appreciated, because in our information request IR-74, we'd asked for a monitoring framework, or a framework for a monitoring plan, and you provided a full response for air quality monitoring, and we felt that you were not able to provide the same framework for other aspects.

So it sounds like you are going to be able to at least provide a significant amount of information tomorrow or shortly that will help to answer that request, so we appreciate that.

MR. DUNCAN: Just on that point, for clarification -- and I won't take very long -- but Mr. Shosky was referring to operational monitoring and ensuring that the site is operating in a proper fashion.

There is an environmental management plan that was provided in the project description report that does speak to things like compliance monitoring during construction activities as well as environmental effects monitoring, and it does provide a framework related to

monitoring programs moving forward. So there may be information there that helps provide additional framework as well.

THE CHAIRPERSON: Yes. Thank you. I have -- I think this might be my last question this evening, but it's just on project costs.

Now, the information that we have is -- the main information is in your response to our information request No. 1, with a -- there was a small clarification or correction in the follow-up. So we have a very -- a fairly basic breakdown here in terms of project costs.

And when Mr. Charles was asking for more information on the cost of incineration, which you've undertaken to provide, in the -- in the RAER Report, all of the options, there were some fairly detailed cost information for those options. And now I understand that subsequently you had another look at those and felt that they had left a lot out. I mean, I was going to ask about that because you've -- in most cases where you redid the cost estimates for those -- for those options that you were carrying forward in the process and you redid the cost estimates, the costs doubled. They just about doubled or they more than doubled.

I'm using Table 213-2, and what you said

was that -- I mean, that seems to me like a considerable jump. I was rather interested in knowing a little bit more about that, whether -- I was going to just -- you do explain the elements.

The cost study -- it says in the EIS that the reviews that you did revealed that:

"The cost estimates contained in the RAER Report failed to account for a variety of items including the cost of possible environmental impact mitigation measures, project management costs and other project overheads, insurance and bonding requirements, the cost of environmental assessment and risk contingencies."

I didn't really quite understand -- so that list was enough to double the cost of all of -- of these options. I don't know if you'd like to reflect on that or if you've got anything to say about that. And what are insurance and bonding requirements? They're things you have to pay for?

MR. KAISER: Just to, I guess, clarify your question, you're primarily interested in a greater understanding as to why the costs appeared to have doubled from the initial RAER estimates?

THE CHAIRPERSON: Yes, that's right.

MR. KAISER: Thank you. As explained and as you have reiterated, the costs that were presented in the RAER Report reflected the cost of the actual remedy. It did not accurately reflect the cost of implementing the remedy. And as you have outlined, many things such as insurance and bonding were not included in those original estimates.

Things like insurance and bonding are costs that are applied against the contractor before the contractor comes on site to do work, so that we as the proponent don't end at the end of the day with some flaw in the job or some incomplete aspect of the work. We want to be able to cover -- cover the -- that possible eventuality if it were to arise. So we apply financial sureties against the contractors as they come on site to do the work to make sure that at the end of the day, we have a complete project.

So those types of costs that were not factored into the RAER because it was not a cost of implementation were estimated and added on subsequent to the estimate that did appear in the RAER. And for that reason, costs did increase.

The instance currently is that we have -- we have gone forward and moved into a predesign scenario. We are awaiting that report, but that report did account

for costs to implement the project. So the current estimate is much more accurate and much more complete than the estimate that was developed for the RAER Report.

THE CHAIRPERSON: This -- this is just curiosity just from my understanding -- I don't think it critical at all, but bonding -- bonding is a project cost? Doesn't the -- wouldn't the contractor have to post a bond? That's not what you're talking about?

MR. KAISER: Actually, that is what I'm talking about, but that ---

THE CHAIRPERSON: They post a bond, but surely -- surely then they do the work and they get the bond back. That's surely not a cost of the project, is it?

MR. KAISER: They have to -- Mr. Shosky wants to add as well to my explanation, but the contractor that comes to the site to do work will expect to -- the contractor will in the end expect to make profit and the contractor will expect to cover the costs that are incurred. Because we would enter into a contract, we would make that contractor incur a cost, and the contractor would expect to recover that cost. Maybe Mr. Shosky would like to add to this.

MR. SHOSKY: I think just in general, it's an important thing to understand that often what gets

explained as cost -- and this is why I asked Dr. Charles exactly how he would like the numbers presented to him -- is that typically a technology cost in the bigger scheme of the overall project cost is really a smaller percentage ranging somewhere between 35 and 50 percent of the cost of the project as a technology cost.

The other costs associated with the job include, for example, government oversight, contractor -- or consulting oversight of the contractor, additional fees associated with the particular areas that you're working in, material fees. There's a lot of fees and services that go into just beyond the technology cost. But just in general, it's not uncommon to see a pure application of a technology being anywhere from 30 to 50 percent of the project cost with these other fees and monitoring and all the other added-on costs as part of that.

So when comparing a cost of a project and taking a project cost -- or a technology cost off the shelf, for example, it's not necessarily representative of the actual cost of implementing that technology till you add on these other costs associated with it. And we have a lot of extra costs with this particular project because of the amount of oversight and monitoring and items of that nature that are part of it.

THE CHAIRPERSON: Well I suppose when you come back with the incinerator costs for Mr. Charles, I mean, to what extent can you provide any additional information on this table that you included in the response to IR-1? Now, it's a very -- I mean, there's not as much information -- I guess what I'm trying to say is there's not as much information in that table as was provided for the RAER options -- not as much information for the whole project as was provided for -- and I think, you know, the sort of things that might be of interest is the -- a sort of -- you know, an estimate of how much is going to be spent on monitoring compared to how much is being spent on ground water, the collection and treatment, for example, some kind of breakout there.

MR. SHOSKY: [u] Madame Chair, we'll take that as an undertaking. It's quite an undertaking, though, I'll let you know, and we will do the best we can to have a reasonable response for you tomorrow.

THE CHAIRPERSON: Thank you very much. Well, as you can see from my colleagues who are shaking their heads, I think we might actually be able to have come to the end of our questions for this evening. So I would like -- that means we do get an early finish this evening, which I think you've deserved, having been on the spot all day. And I really appreciate the effort

you've given in answering our questions over the first two days of the hearings. That's much appreciated.

So we are going to finish early this evening, and we will be resuming tomorrow at 1:00 p.m. And tomorrow we are going to be looking for questions from the public to the proponent.

So thank you very much, and we'll see you tomorrow afternoon.

(ADJOURNED TO TUESDAY, MAY 2, 2006 AT 1:00 P.M.)

CERTIFICATE OF COURT REPORTERS

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Janine Seymour, CCR

Philomena Drake, CCR

Sandy Adam, CCR

Ruth Bigio, CCR

Tuesday, May 2, 2006 at Halifax, Nova Scotia