MACKENZIE VALLEY ENVIRONMENTAL

IMPACT AND REVIEW BOARD

JAY PROJECT EA1314-01

TECHNICAL SESSIONS

Facilitator Bill Klassen

HELD AT:

Yellowknife, NT

Tree of Peace

April 22, 2015

Day 3 of 5

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LIST OF HOMEWORK

Number	Description
15	DDEC is to review the Diavik pre-mitigation (prior to 2008) wet sump ammonia and nitrate water quality results and consider their incorporation into the water quality model for the Misery pit by the end of the Technical Sessions
16	DDEC is to confirm whether the inputs for the post-closure model were based on period 13 or 14 end of period results by the end of the Technical Sessions
17	DDEC is to investigate what thresholds for surface water level and discharge rates for the narrows would trigger mitigation measures (e.g. modified back-flooding rates) during the Jay pit back-flooding period
18	DDEC is to examine whether the results of the ARD analysis would differ if the carbonate neutralization potential rather than bulk neutralization potential were used

LIST OF HOMEWORK (Con't)

Number	Description
19	DDEC is to clarify values regarding runoff coefficients in Table B-3 from Appendix 3A (DAR)
20	DDEC is to provide clarification on the discrepancy between the duration of pumped outflows and increases/decreases in volume in the Jay and Misery pits (Figures 6-3, 6-6, DAR Appendix 3-A)
21	DDEC is to clarify whether chlorophyll a model predictions reflect actual chlorophyll a values, or some other metric of phytoplankton productivity in the Appendix 8-F model
22	DDEC is to clarify if the W-2 model accounts for salt exclusion (Appendix 8-G)

LIST OF UNDERTAKINGS

Number	Description
4	DDEC is to include Jay underground as an RFD case as it may contribute to cumulative effects on caribou (further to Homework 13) by May 8th
5	DDEC is to complete a draft Traffic Management Plan for the Jay road by May 8th, and host a short review period and subsequent workshop
6	DDEC will provide a summary of 2015 hydrogeology results and qualitatively describe how these updates align with previous predictions to the Review Board for inclusion on the public registry by August 1st, 2015
7	DDEC is to validate the hydrologic model for the Desteffany Lake outlet for the years possible (in order to increase the certainty of accuracy of the model) by May 8th

LIST OF UNDERTAKINGS (Con't)

Number	Description
8	DDEC is to provide a comparison of the volumes of Lac de Gras and Snap Lake (including residency time/turnover of water in Lac De Gras) and the total volumes of effluent that will be discharged into these lakes by May 8th
9	DDEC will examine publically available information on pumping test data from Dewey's Fault, specifically the type of testing that was conducted in the Diavik case and identify the potential for conducting such testing at Ekati and its relevance for the Jay case

--- Upon commencing at 9:00 a.m.

THE FACILITATOR: Good morning again. My name is Bill Klassen. I've been asked to facilitate these technical sessions. And today's topic, as I'm sure we're all aware, is water quantity and quality and hydrology. And then int the afternoon we'll be looking at overall water management approach, hydrology, and water quality.

As we have done the -- the last two (2) days, first of all I'd like to acknowledge the fact that we are meeting within the traditional territory of the -- the Yellowknives Dene. And then I would like to do a round of introductions. There are different people in the room today than there were the last few days.

So I think it's helpful to know who is here, and then when they -- they speak you've got some context for that. So before we do that, however, there's the -- the usual matters. There are two (2) exits from this room in the event of an emergency, which we trust won't occur. The washrooms are over on the far corner. There's water and coffee and other refreshments on the -- the side table.

I would ask everyone that has a cell

phone to put it on mute, please, so that we don't have the distraction of -- some of those calls that people have are really interesting. Ground squirrels. They get my attention.

And the other thing, the staff has asked me to remind everyone to sign in, please, so that we have a record of who is in attendance. And then when you do speak, if you would identify yourself so that -- for the transcriber's benefit. These technical sessions are being transcribed, so we want to have again accuracy as to who is saying what.

We have had media present the last couple of days, and so I would ask that if media feels the need to interview anyone, that they do it outside of -- outside of this room. And I think I'll stop there. I have a few more remarks, but let's do introductions first.

I've given you my name, and we'll start with Sachi.

MS. SACHI DE SOUZA: Sachi De Souza, with the Board.

DR. NEIL HUTCHINSON: Neil Hutchinson, technical consultant to the Board.

MR. CHUCK HUBERT: Chuck Hubert, with the Board.

MR. MARK CLIFFE-PHILLIPS: Mark Cliffe-Phillips, with the Board.

DR. KATHY RACHER: Kathy Racher, technical consultant for the Board.

MR. JOHN DONIHEE: John Donihee. I'm Board counsel.

MS. KATE MANSFIELD: Kate Mansfield, with the Review Board.

MR. CHRIS ROSE: Chris Rose, with the Review Board.

MR. EMORY PAQUIN: Emory Paquin, Independent Environmental Monitoring Agency.

MR. TIM BYERS: Tim Byers, Monitoring Agency.

MR. TEE LIM: Tee Lim, with the Agency.

MR. NEIL VAN DER GUGTEN: Neil van der Gugten, AMEC for GNWT.

DR. JAMIE VANGULCK: Jamie VanGulck, with Arktis Solutions for the GNWT.

MR. RICK WALBOURNE: Rick Walbourne, GNWT-ENR, Water Resources Division.

THE FACILITATOR: I think we'll -- we've got a mic being handed around, so we'll take everyone else in turn.

MR. SIMON TOOGOOD: Simon Toogood, with

the Review Board.

MS. MEGAN TOBIN: Megan Tobin, Environment Canada.

MS. SARAH-LACEY MCMILLAN: Sarah-Lacey McMillan, with Environment Canada.

MR. SHIN SHIGA: Shin Shiga, with North Slave Metis Alliance.

MR. PETER UNGER: Peter Unger, Lutsel K'e Dene First Nation.

MR. MARC D'ENTREMONT: Marc d'Entremont, technical advisor to the Deninu K'ue First Nation.

MR. TONY BUGGINS: Good morning. My name is Tony Buggins. I will be providing interpreting services when required.

MR. TOM UNKA: Tom Unka, NWT Metis Nation.

MR. ARTHUR BECK: Arthur Beck, Fort Resolution Metis Council President.

MS. LAURA WORSLEY-BROWN: Laura Worsley-Brown, Dominion Diamond.

MR. RASHAAD BHAMJEE: Rashaad Bhamjee, GNWT-ITI.

MS. TANNIS BOLT: Tannis Bolt, Kitikmeot Inuit Association.

MS. ELISSA BERRILL: Elissa Berrill,

the Wek'eezhii Land and Water Board.

MR. MARTY SANDERSON: Marty Sanderson, GNWT Lands Inspector.

MR. SCOTT STEWART: Scott Stewart, GNWT Lands.

MS. SARAH ROBERTSON: Sarah Robertson, Northern Projects Management Office.

MS. KATE WITHERLY: Kate Witherly, with Environment and Natural Resources-GNWT.

MS. MELISSA PINK: Melissa Pink, GNWT Lands.

MR. PAUL MERCREDI: Paul Mercredi, GNWT Lands.

MR. CAM STEVENS: Cam Stevens, Golder Associates.

MR. ERIC DENHOLM: Eric Denholm, E. Denholm Consulting.

MR. BILL PAIN: Bill Pain, with Waters-ENR.

MR. PAUL GREEN: Paul Green, with Waters-ENR.

MR. NATHAN SCHMIDT: Nathan Schmidt, with Golder Associates for Dominion.

MS. FIONA ESFORD: Fiona Esford, Golder Associates.

MS. KRISTINE MASON: Kristine Mason, Golder Associates.

MR. JOHN FAITHFUL: John Faithful, Golder Associates.

MR. MICHAEL HERRELL: Mike Herrell, with Golder Associates.

MR. PAUL BEDDOES: Paul Beddoes, with Golder Associates.

MS. AMY LANGHORNE: Amy Langhorne, Golder Associates.

MR. STEVEN STRAWSON: Steve Strawson, with Golder Associates.

MR. DON CHORLEY: Don Chorley, with Golder Associates. I'll be doing the hydrogeology assessment for the Jay project.

MS. CHRISTINE BIEBER: Christine Bieber, with Golder Associates.

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond.

MR. ELLIOT HOLLAND: Elliot Holland, Dominion Diamond.

MS. CLAUDINE LEE: Claudine Lee, Dominion Diamond.

MR. PATRICK DUFFY: Patrick Duffy, legal counsel for Dominion Diamond.

MS. STACEY MENZIES: Stacey Menzies, with the Review Board. Did I miss anybody? No? Okay. Thanks.

THE FACILITATOR: Thank you, Stacey. And thank you, everyone. The agenda is on the screen behind me. And so we'll be having a presentation from Dominion Diamonds. And then following that presentation, we'll be looking for questions or comments from the parties present. And after -- those who are not part of the Board staff or providing advice to the Board have had their opportunity to ask questions or make observations, then I will ask Board staff to ask questions as well.

Sachi will be making sure that we cover all of the topics that -- that we need to. Before we get to the presentation though, in the last couple of days there have been homework assignments. Dominion Diamonds has undertaken to provide additional information on some topics that wasn't available during the day. And so, Richard, I would turn it over to you to provide comment on some of the items.

MR. RICHARD BARGERY: Thanks, Bill. Richard Bargery, Dominion Diamond. We -- we've completed a number of -- of the assignments and -- and I think one (1) of the commitments. So I'm going to ask Claudine Lee to read into the record the -- the responses to -- I -- I think three (3) of the homework assignments and one (1) of the commitments.

THE FACILITATOR: Yes, could it -- could we hold that just for a moment? I -- I apologize to the people who are on the -- on the telephone. There are a number of individuals who are joining us by teleconference. They weren't able to be here.

So would those of you who are on the telephone please identify yourselves and give us your association?

(BRIEF PAUSE)

THE FACILITATOR: I always feel as if I'm speaking into a void here and I'm waiting for a response from above. Okay. I -- I thought I heard the telephone, but we'll listen for the -- the sound as they join us and I'll ask them to introduce themselves then. Richard, please go ahead with...

MS. CLAUDINE LEE: Hi. Claudine Lee, Dominion Diamond. I'm going to read out a couple of the homework assignments and one (1) of the commitments.

So in regards to homework assignment

number 11, setbacks and blasting. The safe setbacks from blasting vary based on numerous factors including size and type of blast, the depth of blast within the pit, type of blast, the depth of blast within the pit, type of explosive being used, and material being used.

The safe setback distance for a blast in operational use at the Ekati mine is generally between 500 and 1,000 metres from the pit edge. This is the approximate range of area size monitored to confirm animals are not present. And if they are, blasts are delayed until they move away.

Moving on to homework assignment number 13. Dominion Diamond is of the view that the DAR and supplemental work on Sable and A21 contains a comprehensive analysis of all reasonably foreseeable developments. However, recognizing the importance of the caribou issue, Dominion Diamond agrees to assess a Jay underground scenario in addition to the RFD case for caribou.

The analysis would be submitted by the end of the undertaking period, May 8th, 2015. As stated yesterday, a Jay underground scenario cannot be included in the RFD case. There is currently no defined mineral resource. Significant exploration would be required to adequately assess the feasibility of underground mining.

Additional information to support engineering design is also needed. For these reasons, any assessment of a Jay underground scenario for water-related valued components would require so many assumptions that the quality and utility of such work would not be helpful or meaningful to the assessment of the Jay project.

Homework assignment number 14. Dominion Diamond understood the request provided in KIA-7 and KIA-24 to be about monitored responses by caribou relative to traffic. The responses provided for these requests were focussed on identifying that the caribou focal scan monitoring program was better suited to provide the requested information.

The focal scan monitoring program is a non-camera based -- is not camera based, but instead, quantifies the duration of different behaviours observed by Ekati mine wildlife technicians. Results of both programs were summarized, including some of the practical limitations of a camera study to provide this information.

As well, the response for KIA-7, acknowledged that the camera study may not capture deflection of caribou before they reach the roads.

Dominion does not believe that the responses provided for KIA-7 and KIA-24 include contradicting statements related to the results of these two (2) different monitoring programs.

And then the last one on commitment number 3, process for caribou and roads mitigation plan. Dominion Diamond has heard the concerns expressed over the past two (2) days with regards to monitoring, mitigation measures, thresholds, and the use of a decision tree to manage the risks roads and traffic pose to caribou.

In recognition of the importance of this issue, Dominion Diamond intends to review and consider the comments heard during the technical session and will incorporate appropriate measures related to the Jay project into the draft Wildlife and Roads Mitigation Plan, as we've been referring to in the last couple of days, the Traffic Management Plan, where appropriate.

This document will be distributed to parties by the end of the undertaking period, May 8th, 2015. Following a short review period, Dominion Diamond will host a Jay roads and traffic monitoring and mitigation workshop to receive input that can be considered for inclusion in the final Wildlife and

Roads Mitigation Plan for the Jay project.

THE FACILITATOR: Thank you, Claudine. I don't want to take too much time on these responses, but are there any questions of clarification on any of these? Chuck...?

MR. CHUCK HUBERT: Chuck Hubert, with the Review Board. Thanks for that homework response, in particular, to number 13. So that in fact moves from a homework item to an undertaking. It -- it -- would that be your understanding?

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond, I think that's appropriate, yes.

MR. CHUCK HUBERT: Chuck Hubert, with the Board. Thanks.

THE FACILITATOR: Not seeing any other indication of questions of clarification, I'd like to move on then to today's agenda. And we'll begin with -- with the presentation.

(BRIEF PAUSE)

THE FACILITATOR: And I'll check again to -- out there in radio land, is there anyone on the teleconference that would introduce themselves, please?

MR. CHRISTOPHER AGUIRE (BY PHONE): Hi.

This is Christopher Aguire, with Transport Canada. Sorry about being late.

THE FACILITATOR: Okay. Thank you.

MR. AL WOODBURY (BY PHONE): This is Al Woodbury, University of Manitoba.

THE FACILITATOR: Excellent. Is there anyone else?

MR. TONY PEARSE (BY PHONE): Yeah. Tony Pearse, from the Environmental Monitoring Agency.

THE FACILITATOR: Thank you.

MR. REJ EJECKAM (BY PHONE): I'm Rej Ejeckam, with Environment Canada from Winnipeg.

THE FACILITATOR: Okay.

MR. IGNACIO DUQUE (BY PHONE): Ignacio Duque, from Transport Canada in Ottawa.

THE FACILITATOR: Thank you. Anyone else?

(BRIEF PAUSE)

THE FACILITATOR: Okay. Thank you very much. We'll now proceed with the presentation. I'm not sure -- I'm looking at Board staff here. Do those of you on the telephone have access to this presentation by way of WebEx?

MR. REJ EJECKAM (BY PHONE): Yes. Rej Ejeckam, Winnipeg, okay.

MR. TONY PEARSE (BY PHONE): Yeah. I'm seeing Diamond Dominion -- or Dominion Diamond Corporation.

MR. CHRISTOPHER AGUIRE: Yeah. We have -- I have access to it on WebEx.

THE FACILITATOR: Okay. Thank you. We'll proceed, then, as soon as we get the screen sorted out here.

(BRIEF PAUSE)

MS. SACHI DE SOUZA: Just to go through the agenda in a little bit more detail for right now, we're going to start with the hydrogeology presentation. So -- and moving from that into a question period that primarily relates to questions on the hydrogeology model, questions about the enhanced permeability zone, the water quality that's predicted, and the model inputs.

From there, we're going to move into hydrology. There's a chance that might be able to happen in the morning, I think, and so that will be the hydrology model.

In the afternoon, we anticipate being able to move into the overall site water management and closure predictions. So for site water management, we'll go through the waste rock storage area predictions. So we've deferred this conversation for a couple of days.

So we'll get through that, and then questions related to climate, and then also questions related to the capacity of the water management system and contingencies and safety factors, and then the questions related to -- or the topic of discharge timing and the discharge quality into the receiving environment.

And finally, we'll close off the day talking about closure and post-closure. So those will relate to the meromixis predictions and the effect on the downstream environment after operations.

PRESENTATION BY DOMINION DIAMOND - HYDROGEOLOGY:

MR. DON CHORLEY: Thank you. This is Don Chorley, with Golders. I will be speaking about the hydrogeology and our assessment.

Okay. In this introduction, I'm just going to state some things to keep in mind through the presentation that are important. And it's really responding to the IRs in a general sense, just providing you some background.

The most important thing is that we've used the -- conservative assumptions were built into the assessment, so we have a high level of confidence that the effects to the environment have not been underestimated. With these conservative assumptions, we see predictions of local changes in groundwater quantity and quality, and we see changes, small changes, in lake volumes in the -- outside of the immediate area of the project. Our projected occurred due to groundwater flow to the mine. All of these effects go back to near zero at -- during closure and post-closure.

Okay. How did we -- how did we look at the baseline conditions? Several methods. Site -- site data was hydraulic testing, and the water quality was determined with the Westbay monitoring well. The hydraulic testing has -- has been carried on this year also. The -- this -- this just shows the work that was -- the bore holes that were done in -- in 2014, but there's been additional holes done in 2015, basically twice as many of the deep ones that are around the pipe. And then we've also used Ekati and Diavik data.

What did we -- what were the results of

this -- these investigations? First of all, I wanted to explain what the rig -- rigorous procedure was to get representative samples out of the Westbay instrument.

In the arctic, because of permafrost, what you have to do is you have to drill either with heated water so that the hole doesn't freeze, or you have to drill with brine. And what this can do is it -- when you're sampling it, you have to be sure that that drilling fluid is out of the sample so that you're not getting -- in the case of heated lake water, you're not getting a diluted sample. In the case of brine, you're not getting a sample that is -- is basically contaminated by higher concentration TDS than would be in the -- in the sample.

Represented, we mean that's what is actually in the formation at that elevation. What we did at -- at the Jay project is that we tagged the drilling fluid with a fluorescein dye, and at a concentration of about 600 parts per billion. And what this allowed us to do is that when we were developing an interval, we developed the interval until that dye was less than 10 percent of the drilling fluid.

So that would mean that that would be 90 -- more than 90 percent of that water is actually formation water, represented water, and the other less than 10 percent is actually drilling fluid. And then we could correct for that drilling fluid, because we sampled the drill -- drilling fluid also, so we could correct for that and take -- take the effects of that out of the -- out of the analysis.

This was not -- this was very intensive -- work intensive. One interval, it took up to twenty-five (25) days working twenty-four (24) hours a day on developing the interval, so you can imagine that. But these are accurate and representative samples.

We show on here where the samples lined up. There's the three (3) samples. Interval 5, 7, and 9. And the twenty (20) -- we did the first sampling was in spring of 2014. That's what's reported in the DAR. But we also did another round in 2014, and basically they line on top of each other, so it -- that's -- confirms and validates that. We're also doing a sampling round as -- as is I speak, right now in 2015.

Okay. The -- this slide is -- just shows the hydraulic conductivity data that we got from the -- from the testing. All the diamond shapes are -- are the data from the site. But we also show on this slide the profile that we use in the bedrock. This is outside the enhanced permeability, and so this is the zone for the conservative case in the DAR, and this is the profile for the -- for the reasonable expected case, or the reference case that we use in the -- in the DAR.

You should note that basically, we're assuming that the concentrations of the bedrock outside the enhanced permeability are -- are the same the entire depth of the model domain. That's 1.5 kilometres. This is a conservative assu -- assumption in itself, because what you see is that really, other -- it's -- you see this big reduction in -- in hydraulic conductivity with depth. It's just what you expect, because of the weight of the rock on -- on that.

What we've circled here is what we thought -- these were outliers, and we thought this might be representative of a enhanced permeability zone. We've since find in 2015 -- because we looked at these in a little bit more detail in 2015. These were -- two (2) of these are -- three (3) of these are from the -- from the Westbay instrument. We found that that is not actually a -- a representative enhanced permeability zone, because it doesn't intersect the pipe, and it's of limited extent.

Okay. In our assessment, what -- what -

- the biggest source of conservative in our assessment is this enhanced permeability zone. I -- I want to emphasize, though, this is an assumed zone. We have not seen anything in the drilling in 2014 and 2015 that would be as transmissive as -- as this zone.

So we're -- we're just -- basically what we've done here is we've taken the parameters from the most transmissive zone in -- in the area. And that's Duey's Fault at -- at Diavik. And we've used that -- we've assumed that that is -- is the enhanced permeability zone at the -- at the Jay pit.

There's other -- there's other assumptions that are conservative too, is that it's continuous over the whole model domain. That's 20 kilometres. Conceptually you wouldn't expect this to actually be the -- the case that it would be hydraulically connected over that distance because the -- the greatest disturbance is going to be close to the -- the pipe because that's where it moves up through the -- through the rock when it's -- the genesis of the -- of the kimberlite pipe.

So that's -- that -- that can't be underestimated. Because when we looked in sensitivity at a shorter -- shorter zone, 2 kilometres, it was -- it reduced the groundwater inflow by 24 -- about 24 percent and the groundwater quality by 60 -- about 65 percent.

This is just showing the two (2) scenarios we did. We did a reasonable estimate case. Now, the reasonable estimate case also is -- is a little bit conservative because it does have an EPZ and -- and it is Duey's Fault, but is just 60 percent of Duey's Fault, so 60 metres wide.

And then we have the EA conservative case. And this just shows how the parameters were -- were developed. If we -- we used conservative assumptions for parameter values when -- when they -- when we were uncertain so that was in the literature in analog slice -- sites. We neg -- neglected density effects. Density effects is -- you've got more dense water. That -- that really deep saline water is -- is denser than the fresh water. So by buoyancy and gravity it wants to stay down there. But we didn't put those effects in there. So it was -- it was underestimating the -- underestimating the -- the -- it is overestim -- our model is overestimating the amount of up-welling when we don't consider density effects.

Okay. In the reasonable estimate it's 60 metres wide and the hydraulic conductivity of the bedrock is based on the hydraulic testing. So it's a reasonably conservative prediction. The difference in the EA conservative scenario is that the EPZ is a hundred metres wide. That's equivalent to Duey's Fault. And a hydraulic conductivity of ba -- of -- of the bedrock is -- outside of the Duey's Fault is three (3) times greater than -- than from the testing. So it provides a high level of confidence that effects have not been underestimated.

When you bring all the -- the groundwater inflow quality and quantity together with surface water and perc -- and precipitation, these are all the inputs to the water quality model. This is -- I guess this is really the -- the results of all the modelling and it's all tied together with -- I -- I wanted to show this because it shows the -- the different cases.

This is for the discharge TDA -- TDS concentrations in Misery pit discharge. So this would be discharge to Lac du Sauvage. No, this is to Lac de Gras, right? Lac -- Lac de Gras. And you can see that we have the reasonable estimate is -- is here, is the red one (1). The blue one (1) -- the green -- this green -- green colour here, that's the EA conservative case. This is the reasonable estimate with the TDS profile increased by two (2) times.

And then we also did a case where -- where there was a question in an IR about is -- is the -- is assuming that the weathered rock or the rock that's been affected by isostatic rebound is -- is more permeable on the high -- high end permeable range of its values, is that conservative? I -- I think what they were wondering was that if you reduced the -- the hydraulic conductivity that we assumed in the weathered zone, would that result in more up-welling because you wouldn't have this more fresh water coming in.

What we found was, no, it doesn't. It actually -- it is actually the least conservative case, which is this -- this blue one here. So you can see with this that what we've done with the EA, we -- is we have a high level of confidence that -- that the effects have not been underestimated.

But one (1) important thing that we've found was that the -- it's because of how the water is managed, and you'll find that out later today. Higher groundwater quantity is a dominant factor. If you've got twice as much quantity, twice as much flow, it has a bigger effect than if you have twice as much of the TDS profile, so.

This is -- this is a slide that -- this shows some of the -- the results from our predictions at post-closure for the -- the Misery pit. The Mi -- Misery pit right now is developed in an open talik. That's -- that's an unfrozen ground that connects the -- the surface to the deep groundwater flow regime. So it already is -- it has -- it is experiencing some inflows, but the results say that it's safe to indicate that most of that inflow is coming from the active layer. It's a very small amount.

But what we've assumed in here to be conservatively, we said, okay, that -- that will -- we're just assuming that all that water is coming from an enhanced permeability zone at Misery -- Misery pit. So what -- what we get from that, we estimate the hydraulic conductivity of that zone and we say, okay, here is -- it's directly connected -- it's directly connect to Lac de Gras and this is the -- this is the results of that.

But what we -- what we see is -- also I should mention that as -- as the -- during closure, because of the -- the water that's in the Misery pit, it'll actually expand that talik zone, and that's what we've accounted for during the thermal modelling. So it actually reduces the -- the depth of permafrost here and it actually widens this -- this zone here. But that's been accounted for in this -- this model.

So this is a 2D section along the -- along the enhanced permeability zone. And these are the results from that -- that scenario. There -- there's two (2) scenarios. One (1) is that we increase the hydraulic conductivity, but we narrow the enhanced permeability zone. So we come up with the same transmissivity. And then the other is that we widen it then lower the hydraulic conductivity.

And these are the two (2) scenarios, but both of them sort of stabilize that. About 55 metres cubed per day would be the discharge in the out -- from the -- through the groundwater up to Lac de Gras. And the concentrations would be in here. I can't really read that.

But what this -- this model is -- these results are input to the hydrodynamic model. So they will -- you'll get a presentation on that, I think.

Okay. This is a summary on the conclus -- conclusions that we had. I -- I've shown you that the conservative assumptions were used in the -- the model in our analysis. The project results in local changes in groundwater quantity and quality, but these are -- will go back to near zero over time at -- at post-closure.

Local change to groundwater quality have no significant adverse effect to surface water quality. After mining, groundwater levels, as -- as I said, and quantity will be near current or baseline conditions with negligible changes. There'll be negligible changes in the lake water volumes and at -- after mining those will return to -- to near-zero effects.

Predicted groundwater inflow quantity and quality will be validated during operational monitoring. And those monitoring programs will be developed in the permitting phase. That's the end of my presentation.

(BRIEF PAUSE)

THE FACILITATOR: Thank you. We'll now proceed to the agenda. It's, for the record, Bill Klassen, the facilitator. And we'll be looking for questions or comments on the topics that Sachi outlined for us just before the -- just before the presentation.

And so we'll be asking for parties present to -- to ask their questions. And then, following that, then we'll ask the Board staff or Board advisors to ask their questions.

So we have on the screen behind me here, the first topic then is the Jay pit. And we'll begin with the enhanced permeability zone. And I'll ask for questions on that -- that particular topic. We have a lot of area to cover today, so we'll need to try and keep it focussed. Thank you.

Are there questions on Jay pit permeability zone? Yes. Please, when you speak, identify yourself for the record. Thank you.

QUESTION PERIOD:

DR. JAMIE VANGULCK: Thank you. It's Jamie VanGulck for the GNWT. I have a few questions about the enhanced permeability zone. The first one relates to Information Request 6, and this was -- this question was initially posed to further understand the -- the inputs to the hydrogeological model.

And the developer's response referenced the Diavik pit, in particular pit A154, and some of the model assumptions, the model inputs. So I have a few questions about that -- that case study and how that was applied for the Jay pit.

The first question is for the Diavik A154 pit hydrogeological model. The model was revised in 2004, is my understanding, and it incorporated some of the investigation data completed up till that time, as well as monitoring data.

What was the reason for updating the hydrogeological model for the Diavik case?

MR. DON CHORLEY: Okay. That was updated -- Don Chorley, with Golder.

THE FACILITATOR: Sorry. Just indicate who you are when you speak, please. Thank you.

MR. DON CHORLEY: Gotcha. Okay. Yeah, that was updated because at that time what we learned from the Diavik is that -- that there is these enhanced permeability zones. And that's why it was updated because it was -- the inflows were underestimated because of the presence of that enhanced permeability zone.

So we learned from that -- that project, and that's what we've applied since then. And that's what everybody is applying to -- to kimberlite pipes at this time. Does that answer your question?

DR. JAMIE VANGULCK: Thank you. Jamie VanGulck. Partly. Was this a reassessment that was done in response to the -- the measured data, or was this reassessment that was done as a requirement of a permit or a licence condition?

MR. DON CHORLEY: No, it was done based on the -- on the data. There was two (2) things -- data. You could see -- the reason why it was called

Duey's Fault is that a backhoe operator named Duey was excavating, and they -- they knew -- they could see the -- the greater flow there. And it's always been Duey's Fault after that, that he found this.

So -- but we -- we could also observe that there was higher inflows initially than -- than predicted. And they wanted to -- they wanted to get a handle on -- on the treatment requirements that they would -- they would need for the -- for -- as they went -- went deeper. So it wasn't a requirement of the permit.

DR. JAMIE VANGULCK: Thank you. Jamie VanGulck. Specifically for that model, it was rerun about two point five (2.5) years after operations. I'm -- I'm guessing that's because that's when enough data was there to support the decision to recalibrate.

I just wonder if you could comment on that?

(BRIEF PAUSE)

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. I'm not sure how far down this path talking about Diavik, you know, we -- we would want to go, given -- you know, we're not here representing

Diavik. So I think that's -- that's just a comment I -- I'd like to make. I see -- yeah.

THE FACILITATOR: It's Bill Klassen. This is not an area of my expertise. I'll -- I'll look to Board staff, or Board advisors, as to the usefulness of continuing along this line. Sachi or Neil...? Or Kathy?

DR. KATHY RACHER: Kathy Racher, for the Board. I guess it would just help -- be helpful to know why you're asking the questions you are, and to give a context for -- for the questions so that we could understand how much we need to know about Diavik versus the -- the current project.

DR. JAMIE VANGULCK: Thank you. Jamie VanGulck, for the GNWT. IR-6 was specifically looking to understand the inputs to the hydrogeological model. The Developer has used the Diavik case as -- as one (1) of the sources of information on how inputs were selected.

So I'm looking to see what sort of information exist, why -- why it was used, how -- how important it is, to see if it's relevant and applicable for the Ekati case. I only have two (2) more questions on it, so I won't be pushing it very far.

THE FACILITATOR: I can -- I have --

it's Bill Klassen again. And I -- I need to encourage people to say their name before they speak so that the transcriber knows who it is that's on the record. Thank you.

MR. RICHARD BARGERY: It's -- it's Richard Bargery, Dominion Diamond. I -- I think we can -- we can speak to lessons learned that we've applied. I think that that's -- that's legitimate. That's -- that's the -- you know, the extent that -- that we'd go down that route. So, Don, on that basis...

MR. DON CHORLEY: Yes. Diavik was really the -- the first one that encountered an enhanced permeability zone of any significance. If you look at all the other pipes that have been deve -- developed in the Jay pit area, the enhanced permeability zones are -- are much less transmissive.

So it's -- and as we've gone forward, what we learned from the Diavik was that -- that there is probably going to be enhanced permeability zones. You know, they're different sizes. They're different hydraulic conductivity. And so as we went forward on other projects that we put this -- put enhanced permeability zones in that they're -- even if they weren't necessarily found, we put them in there to be conservative.

And what we've decided to do at the Jay pit is to put in the most -- most conservative enhanced permeability zone that -- in -- in the area, which is the Duey's Fault.

DR. JAMIE VANGULCK: Thank you. Jamie VanGulck, for the GNWT. This is the last time I'll bring up Diavik, I think. I guess -- so I'll -- I'll try to focus it on lessons learned, as well.

The -- the recalibration that was done for the Diavik case relied partly on pumping test results that was done on Duey's Fault to understand the hydraulic properties to some extent. I'm not familiar with other cases where Duey's Fault hydraulic testing has been done.

So I'd like to understand further what sort of hydraulic testing was done for that fault, and whether it would be applicable to Jay pit after mining has commenced?

(BRIEF PAUSE)

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. This -- I mean, this is down -- still down the Diavik path. I -- I think, from -- from our perspective, we'd want to come back -- we'd want to look at what's public information here with respect to this -- this issue and come back to you.

We do have some, but I just want to make sure that we're -- we're clear on -- on that. So for this particular one, we'd -- we'd take away that question and -- and come back with -- with the publicly available information on this.

THE FACILITATOR: It's Bill Klassen. When do you anticipate you might have that response, Richard?

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. We -- we'd have it before the end of the -- the end of the technical sessions.

THE FACILITATOR: Thank you. See -- do you have another question, Jamie?

DR. JAMIE VANGULCK: Thank you for that commitment. It's Jamie VanGulck, for the GNWT.

THE FACILITATOR: Excuse me. It's Bill Klassen. I think we need to record something, here. Go ahead, Sachi.

MS. SACHI DE SOUZA: Just for our record for the end of the day, the -- the homework question, as we will word it, is to clarify the pumping test data done for the Dewey's Fault and the applicability of it for the Jay estimates.

Is that fair from both parties here?

DR. JAMIE VANGULCK: Thanks. Jamie VanGulck. I'd be specifically looking for the -- the type of hydraulic testing or pumping test that was done for the enhanced permeability zone for the Diavik case, and the applicability of completing such testing for Ekati. I'm guessing that would be at a time frame after mine pit development, but I'm not sure, because I don't know the data.

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. Yes, on the basis of, you know, what's publicly available, I think we can -- we can do that. And I think we can do that by the end of the technical sessions.

THE FACILITATOR: Okay. Thank you. It's Bill Klassen. Would you proceed, then, Jamie? Do you have another question?

DR. JAMIE VANGULCK: Yes. Jamie VanGulck, for the GNWT. The -- the current modelling is predictive case with some uncertainties regarding the enhanced permeability zone. We understand that that's a critical component in the model that drives the pit inflows and the water quality.

There is not yet data to calibrate the model to conditions during mining, and I'm looking to see if model recalibration would be appropriate -- would be appropriate to complete, and when would that be appropriate to complete?

(BRIEF PAUSE)

MR. DON CHORLEY: Yeah, we would -- we would probably be looking at recalibrating the model during -- during mining, because we would need that information because it -- we'll have to see how that would be handled in the -- in the Water Management Plan, how you're going to handle it and -- and so we would be looking at -- at recalibration if -- if the -- if the predictions are -- are what we expect to be below the -- below what we are predicting in this conservative case. So we -- we would be updating that model. Don Chorley, Golder.

THE FACILITATOR: Thank you. I was just going to say that for you. It's Bill Klassen.

DR. JAMIE VANGULCK: Thank you for that. Jamie VanGulck, for the GNWT. Any model recalibration is going to need data to -- to support it.

Could you describe a little bit further the type of monitoring data or further hydrogeological data that may be obtained -- that could be obtained between now and then?

(BRIEF PAUSE)

MR. ELLIOT HOLLAND: Elliot Holland, Dominion Diamond. We're currently conducting an additional hydrogeological investigation program to provide additional confidence in our predictions.

DR. JAMIE VANGULCK: Jamie VanGulck, for the GNWT. Could you comment on any monitoring during operations and what type of monitoring and may -- the groundwater to understand the -- the potentials and the water quality in the groundwater during operations, and possibly also maybe pit inflow? I'm guessing that would be another key component for monitoring. I'm looking to find further information on the monitoring program during operations that would feed into model recalibration.

(BRIEF PAUSE)

MR. DON CHORLEY: Don Chorley, of Golder. The types of monitoring we'd be looking at would be measuring the water quality and quantity, and the -- the parameters that would be chosen for that quality have to be developed during the -- during the monitoring plan phase -- during the permitting phase.

THE FACILITATOR: Thank you. It's Bill Klassen. I think Sachi has a question with respect to the additional work that's being done.

MS. SACHI DE SOUZA: I understand you guys are -- you've done some drilling to date and there's probably more going on right now.

Will that data be incorporated prior -- during the rest of this EA? Or is it going to be incorporated in the next regulatory phase? I'm just wondering in terms of the predictions if they're going to be fine tuned during our process.

(BRIEF PAUSE)

MR. ELLIOT HOLLAND: Elliot Holland, from Dominion. We don't expect to be fine tuning our predictions, but we can provide a -- a summary of -- of those results. And, you know, describe qualitatively how they -- how they line up with our previous predictions. So we -- you know, we believe the -- we believe the conservative case will, you know, continue to be the -- the most -- the most appropriate for --

for this process.

MS. SACHI DE SOUZA: So that's fair. I guess the question is if -- if there is additional information that confirms the conservative case or conserves the results, it would be useful for all parties to understand when that information would -- would come in. So if we could get an -- a time estimation for that?

MR. ELLIOT HOLLAND: Elliot Holland, from Dominion. We can commit to providing that information by August 1st, 2015 -- '15.

(BRIEF PAUSE)

THE FACILITATOR: Thank you. It's Bill Klassen. Do you have further questions, Jamie?

DR. JAMIE VANGULCK: One (1) follow-up on -- on the response, and then maybe I'll pass it to others to -- to ask questions. And then I got a few more on -- on other topics. Okay.

Just so I understood the response, the -- the monitoring program that -- during operations and construction of the pit, I'm understanding what you're saying is it would be developed during the regulatory phase. So I'm hearing that a monitoring program is needed, but you're developing that program at a later phase of the project?

MR. ELLIOT HOLLAND: Elliot Holland, for Dominion. That -- that program will be developed during the -- during the permitting phase.

(BRIEF PAUSE)

DR. JAMIE VANGULCK: Thank you very much. I'll -- I'll pass it over to someone else for the time being.

THE FACILITATOR: It's Bill Klassen. I think Sachi has a question.

MS. SACHI DE SOUZA: So just to confirm, it's going to be a commitment that by August 1st, that update is provided for the updates for the hydrogeology?

MR. ELLIOT HOLLAND: Elliot Holland, for Dominion. By -- by August 1st, we can commit to providing a summary of the 2015 hydrogeological results and -- and a qualitative description of their implications for a model.

THE FACILITATOR: Okay. Thank you. It's Bill Klassen. Are there other questions having to with Jay pit, the permeability zone models, and water quality?

(BRIEF PAUSE)

THE FACILITATOR: I don't see any -- I'll ask whether there are people -- sorry, is there -- there's another question here on the floor, as soon as we get a microphone, and then after people in the room have asked questions, then I'll ask whether there are questions from those who are on the telephone line, and then the staff and advisors to the Board.

Could you give us your name?

MR. GORD MACDONALD: Hi. It's Gord MacDonald, with Diavik. And, Don, the hydrogeology predictions on flows and quality are obviously key to the -- the predictions of flows and changes in the receiving environment. And, you know, I think we all get that they are difficult predictions to make, and particularly early in the development.

And -- but we've -- we've seen a lot of different predictions and -- both underestimates and overestimates over the last twenty (20) years, over multiple mining operations.

Can -- can Golder provide a -- a best estimate of confidence limits around the -- around both the flow and the quality predictions? So it's -- lots of descriptions of conservative and worst case, but can you put real bounds on actual numbers to the models that are there? It then would help us all understand where the -- where some of those scenarios fit.

MR. DON CHORLEY: Don Chorley, with Golder. Yes, I -- I can do that. The -- it would be my but -- judgment based on scientific judgment and conservatism. As I said at the beginning, we have a high level of confidence that we are not underestimating the -- the effects. So I would put that at a confidence level of -- of greater than 95 percent -- percentile.

I think that the -- the -- so on both those issues, on both the quan -- quantity and quality, because that EPZ is -- is pretty clear that it's -- it's the most permeable, it's the most transmissive. It probably is that way because there's two (2) pipes that are very close together.

The -- so that -- that increases the total quantity going to the -- to the pit, and it also increases the -- the concentrations because it provides a pathway for that more saline water to go up through the enhanced permeability zone to the -- to the mine.

MR. GORD MACDONALD: Gord MacDonald,

with Diavik. So, Don, the -- if -- if I understand you correctly, if you go to the -- your graphs on -- maybe one (1) of the ones on flow, or quality, whichever one, like, that show all the different scenarios? That's good.

(BRIEF PAUSE)

MR. GORD MACDONALD: I think that one's fine. I'm Gord MacDonald. I -- so one of those scenarios is that 95th per -- your 95th percent confidence limit, which would be in this case the -- the green line? I can't see it very well from here.

MR. DON CHORLEY: Don Chorley, Golder. I'm -- I'm saying greater than ninety-five (95), but let's -- let's keep it at ninety-five (95) and -- just for the -- for this conversation.

MR. GORD MACDONALD: And so is the other end the 5 percent, or where would the 5 percent be? Gord MacDonald, Diavik.

MR. DON CHORLEY: Well, you -- you -- Don Chorley, Golder. That would say that it could be -- 5 percent could be higher, if you like.

MR. GORD MACDONALD: Sorry, what -- what I was trying to get at is the -- is -- is the confidence limits around the -- around the range of -- of possible flows that could be coming. So at one point, you're saying the 95 percent upper limit would be the -- the green line. Where would the lower 5 percent be?

(BRIEF PAUSE)

THE FACILITATOR: It's Bill Klassen. For the benefit of those who are on the telephone, these silences between the asking of question and the response is the Developers conferring. You can't see that, obviously, but that's what's taking place.

(BRIEF PAUSE)

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. Give us a couple more minutes, please, Bill.

(BRIEF PAUSE)

MR. DON CHORLEY: Don Chorley, of Golder. We didn't model that 5 percent also. And I don't know -- you know, it's just based on judgment.

Remember that -- that we have not found an enhanced permeability zone that's -- that's greater than that. It could be -- it could be 100 percent that we're -- we're getting concentrations lower than that.

That's just what I'm basing my judgment on right now, is that -- as I said, no, if you were to find a pre -- a probability distribution for -- for enhanced permeability zones within the region, you would look at all the enhanced permeability zones in the other pipes in the region. They're all less than -- than the Duey's Fault.

So if you were developing a -- a PDF, you would say, Probability distribution. You would be -- Duey's Fault enhanced permeability zone would define the extreme edge of the permeability of that probability distribution function.

So we're highly conservative. I -- just judging at 95 percentile, we haven't looked at -- at modelling at anything if it was greater than that inflow.

MR. GORD MACDONALD: Gord MacDonald, with Diavik. I guess what I'm -- what I'm looking for is that probability distribution function for flow and TDS based on all the information you have and the modelling, with all of those uncertainties, the -- the differences in what you've put into the model, or what you could put into the model, that would be able to describe that function so that -- so that we can understand where these scenarios fit within that probability distribution.

(BRIEF PAUSE)

MR. RICHARD BARGERY: It's Richard Bargery, from Dominion Diamond. So, as Don said, we haven't modelled that, and what -- what we have modelled we think is appropriate for the assessment that we're doing for Jay project.

THE FACILITATOR: Thank you, Richard. Neil, did you have a -- Neil Hutchinson?

DR. NEIL HUTCHINSON: Thank you. Neil Hutchinson, for the Board. This is just a follow-up to -- to Gord MacDonald's questions. When you said you had 95 percent confidence in -- in your estimate for your model, are you referring to the conservative model and assumptions that you used for the development of the assessment report, or the reasonable estimate model that you've since revised? And which one should we there -- which estimate should we use to -- to provide faith in the EA conclusions?

(BRIEF PAUSE)

MR. MICHAEL HERRELL: It's Mike Herrell, from Golder Associates. I'm going to provide a presentation on all the -- the model scenarios, the reasonable estimate case in comparison to the DAR case, in the -- the water quality presentation.

But in -- I'll provide additional detail, but for -- currently, I'll just state that the -- in terms of assessing impacts of the project, the -- the conservative case was carried forward to assess project impacts.

The purpose of the reasonable estimate case was to provide additional context around the conservatism that was included in the -- the Developer's Assessment Report and to provide a more reasonable estimate of what the expected discharge water quality would be from the Misery pit to Lac du Sauvage.

DR. NEIL HUTCHINSON: Neil Hutchinson, for the Board. Thank you. So we can be 95 percent confident that you're not going to exceed the -- the conservative range that you used?

MR. DON CHORLEY: Ninety-five (95) plus.

DR. NEIL HUTCHINSON: Neil Hutchinson, for the Board. I didn't hear Gord MacDonald follow up there, but did we want -- did somebody request an estimate of the lower range and the probability of the low range to the high range? Is -- is that a request that's out there?

MR. GORD MACDONALD: Gord MacDonald, with Diavik. I'm not sure if it's appropriate for me to make the request, but that was -- that is what I was asking.

MR. ELLIOT HOLLAND: Elliot Holland, for Dominion. Such a case we don't believe would be required for -- for the environmental assessment. We concern ourselves with the -- the larger potential effects, not the -- the potential for -- for smaller effects than predicted.

MS. SACHI DE SOUZA: Sachi De Souza, with the Board. The -- I think Dominion's done a good job of giving a conservative overestimate. I think the other end of that is: What if you've overestimated it too far?

Which is one (1) of the reasons why, looking forward into the overall water management, overall TDS predictions, if -- if you -- if it is conservative and it's -- it's far away from what actually happens, the Board needs to understand what the -- what will actually happen, not just the worst case from an over, but what -- what also is the worst case from an under-prediction? MR. ELLIOT HOLLAND: Elliot Holland, for Dominion. That's the purpose of the reasonable estimate case.

MS. SACHI DE SOUZA: So -- it's Sachi DeSouza, with the Board. Speaking along these lines of -- of probability distributions, the way it's been framed so far is the -- the EA case is -- represents something like a -- a 95 percent level for -- or confidence for the overestimate and the reasonable case would be somewhere in the middle of the -- the distribution.

So what happens with the other tail? And I think that is relevant for understanding the potential effects.

THE FACILITATOR: It's Bill Klassen. While Dominion Diamond is conferring on the response, when people use acronyms please clarify what those are. TDS, I think, means total dissolved solids. Is that right? And there are probably other acronyms that will be used. So for those of us who are not working in this field, please clarify that. Thank you.

MR. MICHAEL HERRELL: It's Mike

Herrell, from Golder Associates. The -- the purpose of the -- the DAR is to provide a conservative estimate of water quality for the purpose of assessing impacts to surface water quality. That assessment was done as part of the DAR, and the outcome of that assessment was there were no significant adverse effects to surface water quality.

If you reduce conservatism in the model, the effects become lower and lower. So the concentrations would decrease, but it wouldn't change the overall outcome of the DAR. And therefore running a scenario that is less conservative is not really relevant for this -- for this -- the EA assessment.

MS. SACHI DE SOUZA: Sachi DeSouza, with the Board. I guess we'll leave it there. I've -- I've got some questions later on related to quantity and quality, and I think the site water management presentation and hydrology will hopefully answer some of that and we can -- I can save my questions till then.

THE FACILITATOR: Thank you. It's Bill Klassen. And perhaps everybody in the room knows this, but the DAR is D-A-R, a Developer's Assessment Report. Before I -- I ask the staff of the Board whether they have questions, are there any questions from those of you who are on the teleconference line? Okay. Hearing none, there -- are there other questions within the room? Jamie...?

DR. JAMIE VANGULCK: Thank you. Jamie VanGulck, for the GNWT. I'd like to further understand this 95 percent confidence a little bit better.

Are you saying it's 95 percent confidence prediction for the TDS concentrations in the Misery pit discharge? Or is this a 95 percent confidence in the groundwater predictions only?

MR. DON CHORLEY: Don Chorley, of Golder. No, I can only -- I can only -- my analysis was only for the flow coming out of the pit.

DR. JAMIE VANGULCK: Thank you. Jamie VanGulck. The reasonable estimate case was provided to -- to -- I'm guessing as a means to show how -- a conservative scenario that's more realistic than the conservative EA case.

Do you have a confidence prediction for the reasonable estimate case as well?

(BRIEF PAUSE)

MR. DON CHORLEY: Don Chorley, of Golder. I don't want to speculate what the -- what the percentile is on that. It's easier to -- to be conservative than to be -- I expect it -- expect the case. So we did sensitivities on -- on some of the parameters to just show that -- how much it would vary from the -- from the reasonable estimate. And those are -- those are documented in the -- in the DAR in the appendix. So I -- I don't -- don't really want to estimate what that would be.

DR. JAMIE VANGULCK: Thank you for that. Jamie VanGulck. As you're aware, last week the GNWT passed over a request for further information, to the Developer, to quantify the -- the uncertainty and the -- the estimate, and specifically look at the level of certainty or uncertainty associated with the EPZ.

Just so everyone's aware, here on the Review Boar -- and -- and for the Review Board, we proposed a -- a method that would complete a Monte Carlo type of analysis to look at different parameters of the EPZ and other controlling items for pit water inflow and -- and quality predictions.

We understand that from one (1) of the IR responses, completing a Monte Carlo analysis is time consuming and may not be practical if you have a -- a very complex model. So what we proposed is to adjust the -- the model domain to be a 2D scenario instead of a 3D to be able to accommodate completing such a analysis.

We'd like to further discuss the -- the possibility to look at quantifying the uncertainty and assessing the -- the characteristics of that EPZ zone to put some bounds on these confidence limits. We haven't heard back from the Developer on -- on that request that was sent in last week.

So I guess at this point we're -- we're looking to see if there's an appetite to further discuss that and come up with a -- a method that may be appropriate for both parties.

(BRIEF PAUSE)

MR. DON CHORLEY: Don Chorley, of Golder Associates. What we referenced here -- and I -- I just prepared a response to that, we ref -- referenced a BCMOE document. I got to look at it here, because I've got to -- it's "Guidelines for Groundwater Modelling to Assess Impacts of Proposed Natural Resource Development Activities." This is the most -- I can provide that reference to -- to the Board after. It's the most comprehensive document, probably, in North America. It's -- it's based on a -- a document that was in Australia.

There's two (2) -- two (2) methods for -- for assessing conservatism in -- in this document. There's -- the first method is the method that we used, is the deterministic method, which is you use a -- an expected case. We don't like to call it expected case. We want to call it a -- a reasonable estimate, because there is some conservatism in that. And the -- and the conservative case, which we've done in this -- in this analysis. The other method is to use a Monte Carlo method, but they caution that the Monte Carlo method can only be used if you can populate the -- the probability distribution functions. Okay.

Now, I just want you to recall that that EPZ is an assumed structure that is going through that. I -- the only way you could develop a probability distribution function for that would be by judgment or by using the data from pipes in the vicinity, which all have lower transmissive -- they're not as -- as large as Duey's Fault.

So we don't think that that would add any value to this, because I can just use the judgment that I've just done and said that this 95 percentile plus confidence level.

THE FACILITATOR: Thank you. I believe

Sachi has a -- an observation here.

MS. SACHI DE SOUZA: Before we go into further conversations about probability distribution functions and deterministic models, I wonder if this might be a good conversation to have over lunch, or over the break between GNWT and Dominion, as opposed to at this point in time in this venue.

THE FACILITATOR: Thank you. As the -- the facilitator, what I'd like to do at this point is to have questions from the Board staff and Board advisors and then take a break, if that's acceptable?

(BRIEF PAUSE)

THE FACILITATOR: So seeing no violent protest, we'll proceed that --

MR. RICHARD BARGERY: I -- could I violently protest? Sorry. Richard Bargery, Dominion Diamond. I don't have a problem with Sachi's suggestion on the -- the first issue, to -- to have a discussion with the GNWT at the break.

But I was wondering for other reasons if we could have a break now as opposed to -- before the Board staff start questions that may go for -- for a few minutes?

THE FACILITATOR: Yes, I -- I'm quite -- quite agreeable to that. It's Bill Klassen. So we'll take a ten (10) minute break here, and then we'll come back and start with questions from Board staff on this topic.

--- Upon recessing at 10:20 a.m.
--- Upon resuming at 10:32 a.m.

THE FACILITATOR: Our ten (10) minute break is over. I don't want to embarrass people but there are certain individuals who need to be at the table to be asking questions, Neil and Kathy. So...

(BRIEF PAUSE)

THE FACILITATOR: And they didn't hear me. Here comes Kathy. Neil, I need you at the table. It's Bill Klassen. Just so the record knows that I was the one that was being cursed. We have -- we're still on the subject of the -- the Jay pit and the three (3) topics that were on the screen behind me.

So I -- I know that there are questions from some of the Board staff, Board advisors, and so we'll start with Neil.

DR. NEIL HUTCHINSON: Thank you. Neil Hutchinson, for the Board. This is regarding the -- the Board's IR-29, which was concerned with the -- the wet blasting environment -- potential for wet blasting environment in the Jay pit in the event of higher -- in the event of higher than expected flows of groundwater.

And we had asked you to go back and rerun the water quality model using some ammonia values to reflect the potential that ammonia ANFO wouldn't explode completely, and we've run into a problem similar to that that was seen at Diavik with higher than expected ammonia levels in the sump water.

So you did that, and you concluded that it was groundwater quantity and not quality would have the bigger effect on the Misery pit quality. But you said you -- you reached that conclusion by using data from the sumps at Ekati where ammonia was 5.5 milligrams per litre and nitrate was twenty-two point six (22.6).

I guess my question is: If the concern is unexploded blast residue, wouldn't it be better to use values from the Diavik experience where you would expect that the ammonia and nitrate would have been higher, and how that would have changed your outcome?

(BRIEF PAUSE)

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. That first point, I -- I'm not sure we have that data from -- from Diavik. Perhaps it's publicly available. I -- I don't know, and no one -- no one here knows at this point.

Second is, more appropriate for -- from our perspective, at least, to -- to use the operational practices at Ekati as the basis for -- for that particular analysis.

DR. NEIL HUTCHINSON: Neil Hutchinson, for the Board. In the previous discussions we just had, though, we heard that the Duey's Fault is wetter than anything that's been encountered at Ekati. And so you wouldn't be running into the same type of wet pit environment as has been envisioned here.

And secondly, I might ask Kathy Racher, from her experience with the Wek'eezhii Board, that I believe that sump data would be in the annual water reports from Diavik. Is -- would that be reasonable?

DR. KATHY RACHER: Kathy Racher, on behalf of the Board. Yeah. So that's -- that's the point. You're -- you're using the EPZ from Duey's Fault to -- to model your worst case, which is -- which is a good -- reasonable for the worst case.

But -- and -- and because of that fault -- or one (1) of the contributing factors of that fault was higher than expected levels of ammonia in the Diavik sumps for a period of time, which they eventually got under control. So I guess that's -- and that data, of course, is available on the Wek'eezhii Land and Water Board website.

(BRIEF PAUSE)

MR. ERIC DENHOLM: Oh, hi. It's Eric Denholm speaking. So, yeah. So we're -- we're going back to the -- the IR you -- you referred to, 29, I think, Neil. I made a note of it here. So the approach taken, just to -- just to sort of restate, the approach taken to -- to -- in the assessment was to use the ammonia -- as you said, the -- the ammonia values from pit sumps at Ekati mine.

When that's combined with what Don was describing as the EA case for -- for pit inflows, what you end up with is quite -- quite a conservative then ammonia load, if you like, coming -- you know, estimated coming out of the pit sumps and into the mine water modelling. And so that was -- that's the basis of -- of the conservative approach for -- for ammonia specifically.

Also, I would just -- I'd just remind you that -- and everyone that the -- one (1) of the real strengths of the minewater plan here for the Jay project is this timeframe of five (5) to six (6) years before discharge to the receiving environment is required. So that's a -- that's a substantive amount of time to -- to collect site-specific information on pit inflows, ammonia concentrations, et cetera, with -- basically without risk to the receiving environment.

DR. NEIL HUTCHINSON: Neil Hutchinson, for the Board. No, thanks, Eric. I -- I appreciate that you -- you think you've done a conservative analysis. But of course, if your ammonia concentrations are not as high as they might be, or as they were in the Diavik case, your analysis would not have been conservative.

Your loads would be higher, and we do need to know how much higher they would be, recognizing that there's this delay period. But we need to know what the ammonia management challenges might be in the Misery pit.

(BRIEF PAUSE)

MR. RICHARD BARGERY: It's Richard Bargery, Dominion Diamond. I -- I think what we'll do then, Neil, based on the discussion here, is we'll -- we'll take away the point. We'll have a discussion about it as -- as a team about utilizing the -- using the -- the Diavik numbers, and we'll come back -- come back with a response in the morning about -- about our view on this.

DR. NEIL HUTCHINSON: Neil Hutchinson, for the Board. I'll ask Teacher Klassen here just to mark that down as a homework assignment.

THE FACILITATOR: Thank you. It's Bill Klassen. Sachi or Chuck, do you need any elaboration on exactly what it is we'll be looking for from Dominion Diamonds?

MS. SACHI DE SOUZA: Can we please restate that? Sorry.

DR. NEIL HUTCHINSON: Neil Hutchinson, for the Board. I -- I believe there -- there's an assignment here for Dominion Diamonds to review the -- the need to incorporate Diavik's wet sump ammonia and nitrate levels into their -- into their water quality model for the Misery pit as an example of the implications of -- of a wet blast environment. And you -- you are simply going to discuss that and come back and tell us what your approach is going to be.

Would that be what you agreed to?

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. Yes.

THE FACILITATOR: It's Bill Klassen. Thank you. Are there other questions from Board staff or advisors?

MS. SACHI DE SOUZA: Just a clarification for me. I -- I might have missed it in your presentation this morning.

Does the groundwater model assume that there's no connection between Lac du Savage and the EPZ?

MR. DON CHORLEY: Don Chorley, of Golder. No, there is a connection with the Lac du Sauvage.

THE FACILITATOR: It's Bill Klassen. If there aren't more questions, then, and related to Jay pit and water quality model inputs and the enhanced permeability zone there, shall we move on? I guess we shall not. Jamie...?

DR. JAMIE VANGULCK: Thank you. Jamie VanGulck, for the GNWT. I have some fairly detailed questions that are related to Information Request 8. And I guess I'll be referencing Appendix 8A, some of the tables and -- and pages in there. IR-8 dealt with the predictions of quantity and quality of pit inflows from the -- from the model. The 3D model was presented in Appendix 8A.

Specifically, table 8 -- sorry. Yeah, 8A3-5 presents the different periods that were assessed during construction, the open pit mining, and then into closure. Period 13 deals with the closure, and then period 14 deals with the sump flooding.

Just so I'm clear, is it the end of period 13 -- the results from the 3D model for end of period 13 that the -- is that the starting conditions for the 2D model?

(BRIEF PAUSE)

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. Just one (1) second. We're looking for the various references, here.

(BRIEF PAUSE)

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. We just -- we have -- we're going to have to check on that and get back to you on the exact

-- the exact answer, and we'll try to get that quickly, so.

THE FACILITATOR: It's Bill Klassen. Richard, will that -- will that be later today, or...?

(BRIEF PAUSE)

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. Yes.

THE FACILITATOR: Thank you. It's Bill Klassen. I -- I should inform people that the meeting that was suggested between GNWT and Dominion Diamonds, the Mackenzie Valley Environmental Impact Review Board process provides for such meetings off to the side. But there is a report form that the Board has that they ask parties to complete, and then that information -- a report from those meetings goes on the -- the registry so that others who aren't at those meetings are aware of what was discussed.

Okay. Sachi...?

MS. SACHI DE SOUZA: To clarify the homework question there, it is that Dominion is going to confirm the inputs for the post-closure model are based on the closure -- or the end of operations conditions?

DR. JAMIE VANGULCK: Jamie Vangulck. Yes, I -- I guess specifically is it end of period 13 or end of period 14 3D results is that fed as the initial conditions for the post-closure model to 2D. Yeah.

Jamie Vangulck, for the GNWT. I've got another question regarding Table 8A3-5. The groundwater inflows that are predicted for period 14 have a -- a negative flux value compared to the previous time period that has a positive. And also, period 14 has a, I guess, a non-applicable value for the groundwater quality, whereas the previous period has a -- a concentration of 2,300 milligrams per litre.

Could you further explain what's happening between period 13 and 14 with regards to the filling of the pit and filling of the -- the area behind the dike above the crest of the pit, and why you would have a negative value for groundwater flow in period 14, and the -- the basis for a non-applicable concentration for TDS there?

(BRIEF PAUSE)

MR. DON CHORLEY: The reason why it's a negative value is that actually -- Don Chorley, Golder

-- is that actually water is going out -- out of the -- the pit when it's flooded. It's going out, so it's not directed into the pit, so -- do you understand?

DR. JAMIE VANGULCK: Jamie VanGulck. So if I understand things, the -- and please correct me if I'm wrong, period 13 is the filling of the pit up to the top of the pit level, and period 14 is the -- the water infilling up to the top of the dike level.

Is -- is my understanding correct there?

MR. DON CHORLEY: Yes, that's correct. Don Chorley, Golder.

DR. JAMIE VANGULCK: Thank you. Jamie VanGulck. So the negative value for groundwater inflow in period 14, is that related to water entering the -- the foundation soils? That would be the -- the lake bottom sediment above the bedrock?

(BRIEF PAUSE)

MR. DON CHORLEY: Don Chorley, Golder. No, it's not just the lake bed sediments. It's the whole flooded part of the -- the pit, because when it's completely flooded, it's got a higher gradient, then, so it --

DR. JAMIE VANGULCK: Jamie VanGulck.

Just so I understand the physics of it better, the -- in Period 14, then, the water level within the dike area would be largely the same as the water level outside of the -- of the pit area. So where's the -- the gradient for flow coming from?

(BRIEF PAUSE)

MR. DON CHORLEY: The gradients -- because the -- the area around the pit is actually still de-watered, so it still has lower -- lower pressure, so it's -- it's just kind of equilibrating that to a hydrostatic. Don Chorley, Golder.

DR. JAMIE VANGULCK: Jamie VanGulck. Thank you for that. Could you also address the -- the groundwater quality for Period 14? What does 'not applicable' mean?

(BRIEF PAUSE)

MR. DON CHORLEY: Don Chorley, Golder.

(BRIEF PAUSE)

MR. DON CHORLEY: Yeah. Don Chorley,

Golder. During that period, there's no -- there's no masses going out, but they're going into the pit, so there's no -- there's no loss to the -- you know.

DR. JAMIE VANGULCK: Jamie VanGulck. So if I'm understanding things right, then, this table for groundwater quality would show the -- the groundwater quality leaving the -- the formation and entering the pit, but in Period 14 we actually had water entering the formation from the pit. The pit water quality would have some TDS. I don't know what that would be at that point in time.

Is that considered in the model?

MR. MICHAEL HERRELL: It's Mike Herrell, from Golder Associates. Yeah, that's considered in the -- the site water quality model. So we simulate water quality in the pit, and there's a mass loss associated with that at that flow rate from the pit.

DR. JAMIE VANGULCK: Jamie VanGulck, for the GNWT. Is it considered in the -- the 2D post-closure groundwater model?

(BRIEF PAUSE)

MR. DON CHORLEY: Don Chorley, Golder.

Yes.

DR. JAMIE VANGULCK: Jamie VanGulck. So Period 14 has a -- a -- an 'NA' value for groundwater quality. Was that a model input, then, for Period 14, or is that -- what was assumed for the pit water quality in the -- in the pit for Period 14?

MR. DON CHORLEY: Don Chorley, of Golder. No, it's a calculated value. It's not an assumed value.

(BRIEF PAUSE)

DR. JAMIE VANGULCK: Jamie VanGulck. I'm still not understanding what your conditions are at the boundary of the pit wall and the lake bed sediments during that Period 14 for the concentrations of TDS. Your -- what I'm hearing is the groundwater quality leaving the pit, or leaving the -- the formation is a calculated value. But we're, for Period 14, looking at a -- a scenario where water is entering the formation from the -- the nearby water source.

THE FACILITATOR: It's Bill Klassen. I'll ask Sachi to comment on this. MS. SACHI DE SOUZA: Jamie, I think you're getting to discussions for closure predictions, and I'm wondering if it might be better to leave it for the afternoon when we talk about closure, if that's okay.

DR. JAMIE VANGULCK: That's perfectly fine. Thank you.

THE FACILITATOR: Okay. It's Bill Klassen. Does that then allow us now to move on to -- I -- I don't see the agenda. Hydrology I think was the next larger topic here.

Are there questions related to hydrology and model design, effects of wet and dry years? It was included in the previous presentation.

(BRIEF PAUSE)

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. We have a combined presentation that deals with hydrology, water quality, and mine management plan. So why don't we just provide that entire presentation now, and...?

THE FACILITATOR: All right. Let's proceed with that, then. Thank you.

(BRIEF PAUSE)

MR. RICHARD BARGERY: I lost Bill.

Richard Bargery, Dominion Diamond. So this is going to be broken up into a number of -- there are a number of things in this presentation, so a number of -- we're going to have a number of people presenting. But I think John Faithful is -- is going to start. I don't see Bill, but, Sachi, we can go -- start? Yeah.

PRESENTATION BY DOMINION DIAMOND - WATER MANAGEMENT, HYDROLOGY, AND WATER QUALITY:

MR. JOHN FAITHFUL: I'm John Faithful, from Golder Associates. So as -- as Rick indicated, we -- we've got a couple of component themes along the aquatics line that we're going to speak to over the next fifteen (15) to twenty (20) minutes.

We're going to initiate a -- a discussion on the Mine Water Management Plan, and that'll be provided by Fiona Esford. Hydrology will be discussed by Nathan Schmidt, and then water quality modelling and water quality will be -- will be carried forward by Mike Herrell and myself.

MS. FIONA ESFORD: As discussed on Monday, but also I'll refresh because I realize several of you were not in the audience at that time, the minewater management system proposed for the Jay project takes advantage of the existing open pits for water storage during dewatering once concentrations of suspended sediments increase and are no longer acceptable for direct discharge to Lac Du Sauvage. This water will pumped through the pipelines to the Misery and Lynx pits.

We had one particular IR asking for clarification on the location of the direct discharge to Lac du Sauvage, and it's shown schematically here by those two (2) red arrows that are connected to the discharge pipelines into Lac du Sauvage.

During operations, the Misery pit will continue to be used for water management. Both surface water runoff that enters the Jay pit and the groundwater entering the Jay pit will be pumped through two (2) separate pipelines to the Misery pit. The groundwater will be pumped into the base of the pit, and the surface water will be pumped to the top of the Misery pit.

After year 5 of the Jay pit operations, based on the DAR conservative estimate case, discharge of water from the top of Misery pit will go into Lac du Sauvage through an engineered diffuser. With the reasonable estimate case, this discharge is delayed by approximately one (1) year and the discharge would begin in year 6 of the operations. This overall water management approach has benefits to the operation at -- and is protective of the environment.

Dominion will have five (5) to six (6) years of operation to monitor water quality and quantity that flows into the Jay pit and the overall water quality within the Misery pit to validate the predictions in the modelling prior to initiation of any discharge into Lac du Sauvage. This delay in discharge has a second benefit to the overall water quality in the further downstream receiving environment of Lac de Gras as any overlap between the timing of the Jay discharge and anticipated discharges associated with the A-21 at Diavik mine are reduced or eliminated.

Then in closure, water from the upper portion of Misery pit is transferred back into the lower part of Jay and then a fresh water cap with water from Lac du Sauvage is -- is then -- will the be established in both the Misery and the Jay pits.

Next slide. One (1) of the IRs had specific questions related to the contributing area of the waste rock storage area footprint and where any seepage or runoff would -- would report. And this figure was submitted to explain that.

Next slide. The mine Water Management Pran --Plan has various adaptive management strategies built into it. And -- and these are listed in the DAR and also on this slide for your reference. And I'm sure there'll be discussion later this afternoon related to these things.

Next slide.

MR. NATHAN SCHMIDT: Nathan Schmidt, with Golder Associates. I'd like to say a few things about the hydrology to give an update. Since the DAR came out we've continued with supplemental baseline collection at a full-year program in 2014, and also a 2015 program that is just about to get underway. These include continuous monitoring seasonally during the open-water period at a number of the lakes of interest.

We actually kept our monitoring instruments in at Lac du Sauvage and Lac de Gras outlets over winter this year, so we'll have some -- some full-year data for the first time at those outlets and additional surveys to, you know, confirm what we had based our model on. The 2015 program will also extend down to the Lac du Sauvage outlet and gain us a little more information there.

I do want to say that the DAR in Section 6.6 talks about how, you know, uncertainty may be addressed in one (1) aspect by additional mitigation and also follow-up and monitoring programs. And that -

- that is what we're doing this for, is to -- to address those uncertainties as the project proceeds.

We had a number of questions about model calibration and uncertainties. We put together a water balance model that we're -- we're very happy with, we're very proud of. It's based on, you know, the physical aspects of the -- the watershed and also to capture the -- the wet and dry conditions. What it does is it uses a derived meteorological data set that is long term. And so it does capture those wets and drys, those highs and lows.

There is uncertainty associated with them, and I'll talk about some of those things in the -- on -- in some of the inputs, and I'll speak about those things in some subsequent slides here. I think a key message is that the uncertainty isn't enough to change the results of the assessment. We pass our information downstream to the water quality, to fisheries, to traditional land use. And we don't see that any -- any uncertainties there are affect -- are great enough to affect the outcomes of those assessments.

Now, in the planning and design of the project, like I said, adaptive management strategies will be appr -- will be applied. If we do see conditions that are, you know, sufficiently different from what we've predicted and there -- there are ample opportunities to apply those.

Some of the specific questions we had related to building blocks of our model. And one (1) of the issues there was runoff coefficients, the fact that they seemed a little bit high. And I think the -- the root cause of that is there's -- there's kind of an apples-and-oranges comparison where the runoff coefficients in our model in the building block aren't the same as the ones that you get out of the monitoring data from, say, the outlet of a lake. Ours apply only to land surface areas. And they also take into account sublimation snow -- sub -- sublimation losses along the way.

And so at the end of the day the output of our model is actually calibrated to a runoff coefficient, a water yield, at the Desteffany Lake outlet on the Coppermine River. And so we have a pretty high level of confidence with that.

There were some other questions in the IR about precipitation undercatch. You know, we -- we do see some variability in there. And there can be both spatial and temporal variability in undercatch. But again, to some extent that is compensated for with our calibrated runoff coefficient values.

Stage-discharge rating curves. There were some questions about that, because what our model does is it takes these cascades of flows from the upper watershed down to the terminal lakes and it stores water in those lakes. And the rate at which it releases those -- that water is related to the conditions at the outlet.

We have site-specific information at many of those outlets. The larger lakes are what we concentrated on, the ones in the lower watershed. We applied a different process to lakes in the upper watershed. And, yes, there is some uncertainty in there, but those are in the smaller watersheds. And what we think is that the -- some of them may be a little high, some of them may be a little low, but by the time we get down to the -- the bigger lakes in the lower watershed, that balances out.

And a final question there about lake stage-storage relationships. And essentially with the way the model works with these lakes is it -- we don't need to know what the bathymetry is like underneath the water surface at low water. All that matters is what happens as the -- the water level goes from low water to high water and back to low water over the course of a year.

And if you've been to site, I mean, we don't see a lot of, you know, long, sloping beaches where we'd have, you know, large increases in lake water surface area with increases in -- in water surface elevation. We have things like you see in that photograph there where it's almost a -- a vertical wall along a lot of these shorelines.

Additionally to that, what we see at site is that we don't have large -- and by large I'd say, you know, a metre or greater -- fluctuations in water level in a typical lake over the course of a year. Typically we'll see, you know, .3, .5 metre fluctuations. And so the model's not sensitive to -- to those assumptions.

Finally, I do want to say something about ice modelling. A lot of, you know, questions we've had about that over the course of the project and some of our field surveys have focussed on that. There is uncertainty, but what we do have a pretty good handle on is the small lakes, you know, freezing solid to the bottom over the winter. And we have a pretty good handle with our modelling on when those open up in the spring and when those freeze up in the fall.

With the larger lakes, such as Lac du

Sauvage and Lac de Gras, you know, we're staring to collect some observations. And we have included constrictions on flow at the outlets in the wintertime. It's a fairly coarse sort of approach, but again, since those are low flow periods, we don't think that they're a great influence on the overall model.

MR. MICHAEL HERRELL: It's Mike Herrell, from Golder Associates. I'm going to talk about the -- the water quality model that was included in the DAR and focussing on some of the key themes that were raised as part of the -- the IR process, as well as the -- the updates that have been completed since submission of the -- the Developer's Assessment Report.

So on this figure here, this is the -- the overall conceptual model that was included in the -- in -- in the Developer's Assessment Report and was carried forward into subsequent updates. The -- the key -- the key message behind this slide is a comprehensive water quality mod -- modelling assessment has been completed for the -- the Jay project that includes inputs from the -- Don's hydrogeological model which he just previously presented, as well as Nathan's water balance. And a site water balance was completed.

The -- the purpose of the models was to predict the discharge water quality from the project during operations, and also during closure and post-closure, as well as carry those projections downstream to evaluate changes to surface water quality.

Modelling is an iter -- iterative process, and since submission of the DAR several updates have been completed to the models based on additional information that has become available, and also two (2) additional sensitivities were included to support Information Request responses.

So in this table here, there's a list of the -- the key changes that were made to the model. An updated assessment case was completed to account for updated discharge flows that have been filed by Diavik, and as well as some modifications were made to the Pit Lake hydrodynamic model as part of that -- that update.

A no Jay development case was also completed to address the changes to water quality in Lac du Sauvage and Lac de Gras for a scenario that doesn't consider the -- the Jay project.

And the reasonable estimate case which was introduced this morning was completed to provide additional context to the -- the Developer's assessment result -- results, which were based on conservative input assumptions. So this is to provide a more reasonable estimate of what the discharge water quality would be.

And finally, as part of the adequacy review of the Developer's Assessment Report, a comment was made with respect to the -- the domain of the -- the assessment which was to the outlet of Lac de Gras. And that was updated to -- to model further downstream and to Desteffany Lake to address that comment. So I'll go through -- I'll spend a few minutes going through each of these model updates in the -- in the next few slides.

So the -- the first -- the first update was the -- the updated assessment case. The key changes to that model were the -- the Developer's Assessment Report was based on flows from the Diavik Mine Water Management Plan, Version 12. And since submission of the DAR, an update to that -- those flows was pro -- or submitted to the Board, which includes the -- the development of A21. So the model was updated to in -- include the flows associated with that latest Water Management Plan.

As part of that update, a review of the -- some of the pit lake water qual -- the -- the pit lake hydrodynamic model inputs was completed and -- and changed to -- to increase the -- the conservatism around some of those models. So these are related to wind sheltering and dynamic shading, which influence the amount of wind that's available for mixing.

So to evaluate a more conservative estimate of the meromictic conditions in the -- in the pits, these -- these model inputs were also updated since submission of the DAR. And the data record was also updated from a four (4) year period to a fourteen (14) year record.

The -- the changes made as part of this assessment will influence water quality in Lac de Gras during operations as a result of the changes to the -- the Diavik flows, as well as in Lac du Sauvage and Lac de Gras in post-closure as a result of the updates to the -- the pit lake hydrodynamic model results.

However, the -- the model results that have been completed as part of this update are very similar to those presented in the DAR, and on this figure here which provides TDS profiles in the Misery pit, the -- the outcomes of the -- the updated model are very similar. And that is that meromictic conditions under these more conservative assumptions will develop in the Misery pit and remain stable in the long term.

The -- the updated assumptions allow for more -- or result in more diffusion from the monimolimnion up into the mixolimnion, so concentrations in the -- the mixolimnion do -- do increase slightly. However, the -- the monimolimnion concentrations in the Misery pit remain the same.

And just for -- just to provide some definitions here, the mixolimnion refers to the -- the upper portion of the pit lake which has lower TDS concentrations, and the monimolimnion is the bottom part of the pit that -- that has higher TDS concentrations.

Looking at the results for the updated assessment case for the -- the Jay -- the Jay pit, there -- effectively there wasn't a change in the -- the outcome of the model results. The updated assumptions do allow for more diffusion from the -- the monimolimnion into the mixolimnion resulting in a deeper freshwater cap. However, the model indicates that the freshwater cap will be deeper, and -- but meromictic conditions will occur and also remain stable in the long term.

To -- to provide additional context to the -- the developer's assessment results and the conservatism that was carried forward as part of that assessment, a reasonable estimate water quality model was done.

The -- the key changes as part of this update were really centred around the hydrogeological inputs which Don presented this morning. So there was reduced conservatism in the -- the hydrogeological model inputs, which resulted in a -- a reduced flow to the -- the Jay pit during operations.

What we've learned as part of all the -- the modelling scenarios we did as part of the Developer's Assessment Report and sub -- subsequent updates is that the -- the key control on discharge water quality during operations from the Misery pit is from the -- the groundwater inflows that report to the Jay pit during operations and are subsequently pumped over to the -- the Misery pit, since this accounts for about 65 percent of the -- the total water that requires management during the -- the life of the mine.

So as a result of the reduction in the -- the groundwater inflows to the -- the Jay pit during operations, when this is carried forward into the site water quality model, a reduction in the -- the discharge concentrations from the -- the Misery pit is also seen.

And on this figure, the -- this is -- these are chloride concentrations which is correlated to TDS. It accounts for about 60 percent of the -- the

TDS in the -- the groundwater.

So under the reasonable estimate case, chloride concentrations decrease from an under-ice projected maximum at the end of mine life from around 1,600 milligrams per litre to a more expected value of just over 600 milligrams per litre.

And another important point to note as part of the -- the reasonable estimate water quality modelling is that the -- the storage of the -- the Jay pit, there's less flows being pumped over to -- sorry, to the Misery pit. Less water is being pumped to the Misery pit, which allows for a delay to the discharge from the Misery pit to Lac du Sauvage of approximately one (1) year.

At closure, the -- as Fiona mentioned, the -- the upper layer of Misery pit is pumped to the -- the bottom of Jay pit. So we -- we updated our hydrodynamic models for -- for the -- the reasonable estimate case, which will have lower TDS concentrations since the -- the meromixis is really the -- the likelihood of meromixis occurring is related to the densities of the different water. And the TDS concentrations will decrease as a result of the -- as -- as a result of the assumptions used in the -- the reasonable estimate -- estimate scenario.

So on this figure, I plotted the -- the reasonable estimate scenario compared to the -- the updated assessment results, or updated DAR results. And the -- the conclusions are -- are similar to the DAR in that meromictic conditions are going to form even under the -- the reasonable estimate scenario, providing confidence that the -- the Water Management Plan will result in meromictic conditions in the Misery pit.

The depth to the -- the pycnocline, or the boundary between the upper layer of the pit and the lower layer of the pit, is roughly the same. However, concentrations in the -- the lower portion of the pit are lower in this scenario as a result of the -- the reduced groundwater inflows.

In the Jay pit, similarly, the -- as I mentioned, the Misery pit upper layer, the upper 50 metres, is pumped to the bottom of the Jay pit at closure. As a result of these reduced inflows, operational inflows to the -- the Jay pit, the concentrations in the monimolimnion as part of the -- the reasonable estimate water quality modelling scenario are lower in comparison to the -- the updated assessment results that are provided in this figure as dashed lines.

However, the -- the hydrodynamic models that were completed indicate, even with a -- a much lower TDS concentration in the monimolimnion, the -- the meromictic conditions will form and remain stable in the long term.

The one (1) difference is the -- the lower TDS concentrations and the updated wind sheltering coefficients will occur -- will result in additional diffusion from the monimolimnion to the mixolimnion. But this doesn't have a material change to the -- the upper layer concentrations, but it does produce a much deeper fresh water cap, which would provide additional stability for -- to -- to maintain meromictic conditions in -- in the pit.

And as I indicated, a model was completed for Desteffany Lake. The -- the key purpose of this model was to evaluate changes downstream of the outlet of Lac de Gras, between the outlet of Lac de Gras and the outlet of Desteffany Lake. So on this figure I've presented chloride concentrations to -- to show the -- the change in -- in water quality.

I -- I do want to clarify that the -- the changes to water quality in Lac de Gras and Desteffany are a bit exaggerated based on scale. The maximum chloride concentration on this figure is 6 milligrams per litre.

And this model was -- it was a mass balance model that was completed in Goldsim, the same software that was used for the -- the site water quality model, and looking at the -- the natural attenuation of outlet water quality that would occur downstream. And what the model indicates is there is additional attenuation of outlet concentrations downstream of the outlet of Lac du Gras and into the Coppermine River and at the outlet of Desteffany.

A key point is that the -- the -- going back even to the conservative assumptions used in the DAR, which are presented -- or the updated assessments results which are also presented on this -- or used in this assessment, the -- the key outcome of the DAR was there was no significant adverse impacts to surface water quality in Lac du Sauvage, Lac de Gras, and by extension, that can be applied to Desteffany Lake, since there aren't any other developments down -- between the outlet of Lac de Gras and Desteffany Lake.

On this slide, I've presented the -- the three (3) -- the three (3) model updates that have been completed, with the exception of Desteffany, to show the -- how the -- how the changes made influence water quality in Lac du Sauvage and Lac de Gras. I haven't done a comparison of the updated assessment case to the DAR case in this slide. That is provided in Appendix B, which was submitted with the IRs, and that is the compendium of supplemental water quality modelling. And these are total dissolved solids concentrations for depth average, maximum depth, and surface water -- water quality concentrations that are extracted from the -- the hydrodynamic models.

The updated assessment case results were very similar to those presented in the DAR. And that comparison is provided in the compendium. And there was numerical differences, but there -- in terms of concentrations there was no material difference in the -- in the updated assessment case in -- in both of those lakes.

As expected for the -- the reasonable estimate case, the discharge concentrations are lower so you see a much lower concentrations in the -- in Lac du Sauvage and Lac de Gras in comparison to the -- the updated assessment case. And the no Jay development case, you -- you don't see a change to water quality in Lac du Sauvage. However, there -- there's still an increase in -- in Lac de Gras and this is as a result of existing operations within the -- within that watershed. I'm going to pass it off to John Faithful now to talk about key IRs related to water quality.

MS. SACHI DE SOUZA: Sorry. Can we just take one (1) second there? We are having some teleconference problems, so can everyone who is on the teleconference line please hang up and dial back in?

(BRIEF PAUSE)

THE FACILITATOR: It's Bill Klassen. We seem to have experienced some technological difficulty with the conference line and the -- the WebEx, and now we're having difficulty contacting the people who were on the teleconference.

So as not to delay this unnecessarily, what I'm going to suggest is that we finish with the presentation, and then we'll break early for lunch and come back early from lunch so we can then get into the discussion rather than just have a -- a short period of discussion at -- following the presentation.

So if you could continue with the presentation and complete it, and then we'll break for lunch? Thank you.

MR. JOHN FAITHFUL: Thanks, Bill. It's John Faithful, from Golder Associates. So I've got a couple of slides to -- to finish off the presentation that are going to focus on a -- a couple of the IR themes that -- that we received for water quality.

The first slide here is discussing phosphorus. There's a number of the IRs that spoke to the concern of modelled increases in phosphorus in the receiving environment, especially Lac du Sauvage. Dominion characterized existing traffic status of Lac du Sauvage as ogliotrophic for the reference condition based on measured total phosphorus concentrations.

From the measured spacial and temporal variability that we saw, the trophic status was also shown to extend into the mesotrophic range. This characterization is based on the total phosphorus trigger ranges provided by the Canadian Council of Ministers of the Environment 2004 Phosphorus Guidance Framework document.

The water mod -- quality modelling that -- all the modelling that went into the water quality modelling that it covered off Don's hydrogeology, Nathan's hydrology, and Mike's water quality modelling projects a during operational minewater discharge from Misery Pit to Lac du Sauvage. Total phosphorus concentrations in Lac du Savage are anticipated to increase for several years in the latter period of discharge to mesotrophic conditions, particularly during under-ice conditions before returning to background concentrations following completion of the project.

The Developer's Assessment Report, which I'll refer to as the DAR, concluded that this change would not lead to increased risk of adverse environmental effects. It found that the water column would remain sufficiently oxygenated -- would remain sufficiently oxygenated during under-ice conditions throughout Lac du Sauvage.

Plankton and benthic invertebrates biomass may increase as a result of the increased nutrients, but clear shifts in the community assemblages of the ogliotrophic organisms would be unlikely.

As a result of the increased food base in Lac du Sauvage, due to the nutrient increases and increased productivity, there may be a increa -- major -- a minor increase in growth and reproduction rates in the fish valued components.

The key piece in the DAR modelling regarding total phosphorus projections is a conservatism around the phosphorus source term input to the geochemical -- to the hydrogeological water quality monitoring. The prime resource of phosphorus is -- is groundwater flowing towards the Jay pit and subsequently pumped to the Misery pit.

The source term is conservative. In our opinion, it's one (1) of the constituents with potentially the highest level of conservatism. The phosphorus concentration assigned to groundwater for the modelling was defined from measured concentrations of groundwater inflows to the Diavik pits and the -- and the site-specific Westbay data from within the Jay ore body.

Pitting flow data are available from Ekati, but rather than total phosphorus concentrations measured in the sump water, the focus is on dissolved phosphorus. So therefore, this data was not included.

The source phosphorus concentration used for groundwater in the modelling is the median concentration of the Diavik and the Jay data. This input concentration is .4 milligrams per litre or -- or 400 micrograms per litre. For some context, the Jay Westbay total phosphorus data ranges from -- from about 20 to 60 micrograms per litre.

Also the Ekati dissolved phosphorus concentration ranges from -- from below detection to about 100 micrograms per litre. But these values are -- are well below the -- the median value that was carried forward into the modelling.

We know from the hydro -- the hydrogeology modelling that total phosphorus is not necessarily correlated to TDS, and this seems to be supported by the Diavik and Ekati data. That means the total phosphorus concentrations don't necessarily increase with depth. Therefore, we can assume from that, based on the Jay-Westbay data, that total phosphorus concentrations that have been recovered to date may remain as measured with the Jay pit development.

Additionally, as Don indicated this morning, there's conservatism around the projected groundwater inflow volumes to Jay pit. So the total phosphorus load to the Misery pit is also likely to be overestimated. Dominion believes the projected groundwater total phosphorus concentrations are likely higher than reasonably expected, so we're confident that we have overestimated the phosphorus concentrations in Lac du Sauvage.

Once Jay pit development commences and the groundwater inflows to Jay pit are monitored, Dominion should have an initial understanding of what to expect for groundwater total phosphorus concentrations. So for the purpose of the EA, as has -

- as has been mentioned on numerous occasions today, the -- they're carrying the conservative case through to -- to an EA case to -- to ensure that there isn't an underestimation of potential effects, and we think we've done that quite successfully with regards to -- to total phosphorus.

Next slide, Mike, please? Another IR was on significance, and I thought I'd take the opportunity to -- to point out a few -- to -- to make a few points on -- on this particular issue. For this key line of inquiry, the terms of reference identified hydrogeology, hydrology, and water quality as valued components.

Our assessment in this section focused on measurement indicators which represent properties of the environment and valued components, such as constituent water chemistry that, when changed, could result in or contribute to an effect to the assessment endpoint.

For this section of the Developer's Assessment Report, the assessment endpoint is defined as the suitability of surface water to support or maintain healthy and sustainable aquatic and terrestrial ecosystems, and the ability to use the water by wildlife and humans.

It's a very integrated assessment approach that characterizes all of the -- all of the potential influences on surface water quality as a result of project activities, which include hydrogeology, hydrogeo -- hydrology, and -- and the surface water quality elements.

The approach used in the Developer's Assessment Report was to assess the effect project activities may have on the elements of water quality, and to components of the receiving environment that are to be protected so that a determination of potential risk to aquatic life or use as a result of the project could be evaluated.

This was done through evaluating the changes to water quality by comparing them to baseline conditions, water quality guidelines and objectives, and aquatic health thresholds and benchmarks. This approach is consistent with other EA aquatics assessments conducted in the North.

Comprehensive quantitative water quality models were developed as -- as you've heard already this morning, and used to project these changes to groundwater hydrology and water quality as result of the project activities. These models have used conservative assumptions to make sure that the changes or effects would not be underestimated.

Water quality and its influence on the receiving environment in Lac du Sauvage and Lac de Gras were projected based on site-wide interactions of all of the various models and -- and components that have been described by -- by Mike, Don, and -- and Nathan, as well as other project influences and other mining operations over the life of the project and beyond within this watershed.

The assessment focusses on a series of questions that link the project to the assessment endpoint. These include: What are the key project activities that may affect the receiving environment? That's outlined in the pathway analysis within the -- in Section 8. What happens to the receiving envir -- envi -- environment as a result of project activities? That carries forward into the residual effect assessment.

What are the effects of the water quality changes to the environment in terms of the measurement indicators? What do changes in these measurement indicators mean to the assessment endpoint? And what level of change to the measurement indicators would make a -- a significant impact?

The model water quality results were

compared to -- to aquatic life guidelines, drinking water guidelines, aquatic health effects benchmarks. These -- these guidelines and benchmarks are based on scientific, defensible data that are used to determine the potential risk to water quality, change to aquatic life, and the use by wildlife and humans. It's a well-considered approach which also guides mitigation that's built back into the -- into the mine plan.

Next slide, Mike. The effects study area. So the effects study area for this -- for -- for water quality is the area within the baseline study area where project activities could potentially have direct or cumulative effects to the assessment endpoint.

The effects study area for water quality was defined to the extent where measurable effects were anticipated to occur. For the purposes of the assessment, this area was set as the outlet of Lac de Gras. The quantitative hydrodynamic models developed for the DAR included Lac du Sauvage and Lac de Gras, and that's been outlined by -- by Mike. The DAR assessment for water quality suggests that during the life of the project, small changes to water quality may extend beyond the Lac de Gras outlet and potentially into -- into Desteffany Lake.

As you've heard from Mike and -- and others this morning, this modelling is built around conservative assumptions which are directed towards overestimating water quality constituent concentrations in the receive -- receiving environment beyond that which may realistically occur of the life of the project.

The supplemental models that -- that Mike has described just previously put some context into these model water quality concentrations for predicted water quality. And it took a semi-quantitative downstream model through Coppermine to the mouth of -- to the outlet of Desteffany Lake to determine the potential for change in the Coppermine River as a result of the assessment conclusions for Lac de Gras.

There was a reasonable estimate case that -- that was built upon less conservative water quality assumptions in input to -- to provide a -- a more expected case around what the -- the project effects might likely be, and another Jay case model to project water quality in Lac du Sauvage and Lac de Gras over the Developer's Assessment Report time frame without the project case.

The first two (2) models determined that small water quality changes could be possible downstream of Lac de Gras, but as concluded in the DAR, concentrations are projected to be less than -- than those predicted at the outlet of -- of Lac de Gras. And the last model showed that project effects fall within in the range of predicted changes under the no Jay case in Lac de Gras prior to the project influence. What the project does when it's superimposed upon this no Jay case is extend these changes bef -- before constituents return to background levels. So there's an increase in duration of -- of effects to Lac de Gras.

Throughout the Developer's Assessment Report, the potential magnitude of change at the outlet of Lac de Gras was discussed and evaluated relative to the measurement indicators and screening values, both of which take into account aquatic life, wildlife, and human end users. The magnitude of predicted changes in Lac de Gras were shown to be sufficient to result -- not -- were shown to not be sufficient enough to -- to result in any risk to significant adverse effects. Thus, any downstream trends -- any downstream changes in Lac de Gras, if measurable, would not cause -- sorry. Thus, any changes downstream of Lac de Gras, if measurable, would not cause a significant adverse effect.

In summary, the DAR was completed by using -- by assessing the potential effects to water quality and took into consideration the magnitude of change and the geographical extent of change where project activities could potentially have direct and cumulative effects to the assessment end point. Thanks.

MR. RICHARD BARGERY: Richard Bargery, Dia -- Dominion Diamond. That's -- that's the -- the presentations, Bill, so.

THE FACILITATOR: Thank you. It's Bill Klassen. And it's approximately twenty (20) minutes to 12:00. As I said a little while ago, rather than begin the -- the discussion now, I suggest that we break for lunch, come back at twenty (20) to 1:00, and then we'll get underway with the discussions. And my apologies to those who were on the conference line. We lost the connection, but we'll be back with you at twenty (20) to 1:00 Mountain Daylight Time. Thank you.

--- Upon recessing at 11:38 a.m.

--- Upon resuming at 12:45 p.m.

THE FACILITATOR: Good afternoon,

everyone. My name is Bill Klassen, and I'll be facilitating the session. I understand that the people who joined us by teleconference are back, so I wonder whether you could tell me again who you are, and where you are, and your affiliation? I'm just -- I'm asking that just to make sure that we do indeed have you back online with us.

MS. ANNE WILSON (BY PHONE): Hi. It's Anne Wilson, with Environment Canada.

THE FACILITATOR: Thank you. Anyone else?

MR. IGNACIO DUQUE (BY PHONE): Ignacio Duque, with Transport Canada.

THE FACILITATOR: Thank you. Is there anyone else on the telephone?

(BRIEF PAUSE)

THE FACILITATOR: Okay. Thank you. And thank you all for coming back early. We'll -- we'll get underway. Just before lunch we had a presentation from the Developer on hydrology. And so this afternoon we'll be focussing the discussion on that topic.

And in order to -- well, as -- as

everyone understands, I'm sure, the purpose of these sessions is to resolve what may be outstanding matters related to the Information Requests and the responses.

So as much as possible, the information that we're trying to elicit from Dominion Diamond is to assist the Board in -- in making their assessment. So I would ask those who will be asking questions to provide us with a bit of context before you ask your question, what -- what is the --the main purpose in asking the question. If it's for clarification of details, hopefully it will be for clarification of details, it would assist the Board in making their assessment.

So with -- with that as context for the discussion then, let me just check with Sachi to see whether there's any further context that she wants to provide.

QUESTION PERIOD:

MS. SACHI DE SOUZA: I do, I do. So for this afternoon we're going to walk through hydrology and site water management. So the first portion we would like to focus just on the sort of regional hydro -- hydrologic models. And the questions that were in there were primarily related to the model designs and -- design, and the questions about the effect of wet and dry years in the inclusion of A21, which was discussed in the presentation.

After the base and wide hydrology, we'll move into site water management. And we'll start off with a conversation about the waste rock storage area, and any questions about the waste rock storage area. And then move into the overall management in terms of capacity, safety factors, contingency planning, the actual site water balance model itself, and water quality predictions that are going into the environment as a result of the mine operation.

From there, we'll move into closure predictions and possible effects from closure. And then we'll end off with a discussion on the assessment endpoints and thresholds for significance -- of significance.

THE FACILITATOR: Thank you, Sachi. It's Bill Klassen. So we'll begin as -- as we did before, or we did this morning, with questions from parties in the room. And then I'll ask whether there are any questions from the folks who've joined us by teleconference, and then questions that may be coming from Board staff or Board advisors.

I -- I will of course provide

opportunity for Board advisors with their expertise to join the discussion when their comments may help provide some clarity.

So are there questions then from parties in the -- in the room on the -- I believe you said waste rock storage area first. Yes, and hydrology.

MR. NEIL VAN DER GUGTEN: Neil van der Gugten, for the GNWT. My first question: Now, just a clarification. When I refer to IRs, there's the original IR number, and then the response number which is about two (2) points less than that.

So which one do you want me to use?

THE FACILITATOR: Perhaps Sachi can provide clarification on that.

MS. SACHI DE SOUZA: Yeah. We -- we appreciate the number of numbers. So the IR number. So if it's GNWT-6, which is two (2) less, that's the one to be using, the bolded number on that table.

MR. NEIL VAN DER GUGTEN: Okay. So with respect to IR-28, it had to do with the overall hydrologic model. And it's a very complex model. It's very detailed. It takes account of a lot of the different hydrologic components that go into computing runoff.

There's very little data available, so a lot of -- a lot of parameters had to be estimated. And some of the model parameters, when you look at the literature, do not appear to be very realistic and/or they are subject to large errors.

And my question has to do with the fact that there really is no quantified estimate of the accuracy of the error limits of the model results. There is quantitative descriptions that are -- yes, the results are acceptable, they're good, they conform. But there's no actual number that gives us a feeling, other than the subjective estimate of the Developer, what -- how good the model has performed.

So for example, there are a couple of graphs showing hydrographs for a couple of the lakes for which we do have data. There's Lake E10, Ursula Lake, and Lake D3, Counts Lake. The plots are presented in a very compressed fashion. It's very difficult to actually compare the observed data with the modelled results.

It appears to me that the modelled peaks are on the order of three (3) to six (6) times higher than what has been observed. And my question is: I -- we would request the Developer to apply some kind of objective, quantitative evaluation of the model reliability.

Such approaches are available in the technical literature. For example, there's a paper called "Model Evaluation Guidelines for Systematic Quantification of Accuracy in Watershed Simulations."

And my request is: Why was such a -- an approach not provided so that those who have to evaluate the results are able to have some quantitative evaluation of the reliability of the hydrologic modelling? Thank you.

(BRIEF PAUSE)

MR. NATHAN SCHMIDT: Nathan Schmidt, with Golder Associates. Thank you for your comments and the -- the paper that you did provide to us or, you know, referenced. We -- we pulled a copy of that and have reviewed it. It's got some -- some good guidance in it. Now, one (1) of the -- I'd like to provide a little bit of background on the model and why we chose this approach.

And for the people who haven't been here since kind of the very beginning back when it was Jay-Cardinal instead of just Jay, there might not be an understanding of the reason we needed kind of more detailed information for those tributaries to Lac du

Sauvage and the reason we -- we chose this approach.

The first part of the project, you know, we were -- we compiled a baseline, and we used that information as part of alternative evaluation for a project that has now evolved to something that is quite a bit less -- a -- a lower disturbance to the environment. The -- the initial project had, you know, potential large stream diversions. It had dikes that, you know, sequestered a significant portion of Lac du Sauvage, that sort of thing. So there was a need to, you know, look a lot closer at those tributaries to Lac du Sauvage.

And so that kind of carried through. When the project was scaled back to just the Jay project, now the focus is -- is much more just on Lac du Sauvage, on Lac de Gras, and on some of the smaller direct tributaries that are really associated with the project footprint. The selection of that approach where we looked at the -- the precipitation and the runoff, and we used the runoff coefficients, like you said, it is fairly complex. But, you know, we believe it was warranted for that, and I believe in the Lac du Sauvage watershed, you know, it is -- it is still warranted.

Now, the -- the paper that you provided

has a -- a quote that kind of struck me. It says:

"According to Refsgaard 1997, model validation is the process of demonstrating that a given site-specific model is capable of making sufficiently accurate simulations, although sufficiently accurate can vary based on project goals."

And I think the important things that we're looking at with regards to this assessment are the inputs that we're providing to the water quality. And in this -- you know, because of the storage in Lac du Sauvage and in Lac de Gras, the annual water yields to those water bodies are by far the most important thing that we're looking at with regards to water quality. And we have calibrated to the water yield from the long-term water survey of Canada station at Desteffany Lake outlet.

So we have quite a high level of confidence in that. And it's that water yield, when we take it back up the line, where we get those runoff coefficients for the land areas. Okay.

So, you know, in that I can -- I can speak with -- with quite a high level of confidence. The -- the hydrographs that were provided in that validation section are intended as a qualitative, sort of provide a little bit of comfort, you know, that we weren't way out of the ballpark.

We prefaced that section, and I'm going to -- I'm going to read from Section F.2 -- F2 of the baseline -- the hydrology baseline. And it says:

"The water balance model continue -- considers physical characteristics of the basins and derived long-term meteorology for the hydrology baseline study area. The baseline meteorology is intended to represent the long-term mean and variability at the project."

Okay. So, you know, part of the terms of reference of this project were we weren't just going to rely on means. We were going to look at wet and dry conditions. And so in using that long-term meteorological data set, that's how putting it through this model, we get the variability in the hydrological response.

The quote carries on, and it says:

"But it is not intended to represent contit -- conditions at specific locations on specific dates. For example, a rainstorm that may have occurred in the Lac du Sauvage basin in the summer of a specific year may not be present in that baseline meteorological series, because it's based on other locations."

There's spatial variability there. But because we're dealing with the long-term data set, what we expect is the statistics that come out will adequately represent what's going on.

Similarly, differences in site-specific snow pack and temperature are expected to be present in any given year. However, over the long term, mean and extreme rainfall characteristics at that location should be represented. It says:

"For this reason, measured and modelled hydrographs at specific locations are not expected to match precisely. However, the hydrological statistics at specific locations are expected to be adequately represented by the water balance model. It's recognized that future monitoring efforts should focus on the further validation and, if necessary, recalibration of the water balance model."

Okay. So, you know, we have included those -- those hydrograph for comparison, but that was just a qualitative thing. There was no intent in demonstrating that they match exactly or precisely.

MR. NEIL VAN DER GUGTEN: Neil van der Gugten. Yeah, I understand that it's futile to try to mat -- match things precisely. But a difference of three (3) to six (6) times in the peak is not very good, in my opinion. And, fine, you're using the annual yield as a basic parameter to calibrate your model. I didn't actually find the calibration data that does that.

I mean, maybe it is there somewhere, but I couldn't find it. So if you can locate that for me, that -- I would appreciate that. And at the end of the day, whatever you are using as your prime parameters, why could you not use that prime parameter or some similar parameters and put that into this objective evaluation of simulation to see how good your model is? Because right now, from what I've seen, it doesn't seem as good as you claim it is.

So I -- I remain to be convinced.

(BRIEF PAUSE)

MR. NATHAN SCHMIDT: Nathan Schmidt, with Golder Associates. I'd like to comment on the -- the peaks that you mentioned there first. And for the Ursula Lake, the E10 outlet, indeed, there is something that shows up there that -- there -- there's a difference.

And one (1) thing we know about the -- the streams in the north is that the conditions at the outlets, at the lake outlets during melt, melt tends to happen pretty fast. And if we have melt that occurs before the lake outlets open up, we can get rapid rises in -- in lake water surface elevation and we can get our -- our peak flows happening there.

So at that particular location it is possible that it's not completely accurately representing that. I will note though that that is a lake in the upper watershed. It's, you know, quite a distance upstream of Lac du Sauvage. And what's going to happen is any, you know, discrepancy like that as that water moves downstream what we're going to get is storage and attenuation, and we're going to see less and less of that effect the further we move downstream. So it will be muted -- very muted by the time we get to

-- to Lac du Sauvage.

The other comment on that is for Lake D3, the -- the Counts Lake outlet. One (1) of the issues that occurs with this -- with measuring these things early in the season is quite often it's -- it's difficult to get in there and actually monitor that accurately.

If you're trying to do continuous monitoring under ice conditions, and monitor that complex interaction between ice melt and snow melt runoff and -- and flow out of the lakes, unless you actually have somebody stationed at that lake twenty-four (24) hours a day, the monitoring isn't necessarily going to capture that.

And, in fact, the data that we used -- the historical data that we used oftentimes missed the peak. The commencement of the monitoring season was after the peak had already occurred. And so that's one (1) of the reasons for the -- the Counts Lake D3 outlet that, you know, the peaks might not seem to -- to be captured. Like we -- we see them in the modelling but we don't necessarily see them in the -- in the monitoring data.

That said, speaking of the validation here, the data that we really need to -- to validate, the most relevant data set, we need a long-term data set to match our -- our long-term simulation. And what I'm going to suggest is that the most appropriate location for doing that is at the Desteffany Lake outlet with the -- the hydrograph at the Desteffany Lake outlet. It's been monitored since 1994. There are some gaps in the record there but we do have, you know, at least fifteen (15) years of, you know, full year of data there.

We used that location for calibration of water yield only. We did not use it for calibrating any hydrographs. And so it would be appropriate to use that data set for validation, and we're prepared to do that. And I'm going to state though that because we are using our derived long-term meteorological data set compared to the shorter term site-specific data set at the Desteffany Lake outlet, we're not going to expect a perfect match.

But I believe, you know, based on what we've seen qualitatively from the hydrographs that, you know, we'll come up with something following the -- the methods in the Moriasi et al paper that should be favourable.

MR. NEIL VAN DER GUGTEN: Neil van der Gugten. So are you going to go year by year for each year of data that you have for Desteffany Lake? I mean, you have so many years of data there. You have -- you'll have hydrographs for the discharge there, and you can simulate the hydrographs because you're doing day by day simulations.

So you should be able to produce modelled hydrographs for Desteffany Lake and compare them to the observed hydrographs, is that right?

(BRIEF PAUSE)

MR. NATHAN SCHMIDT: Nathan Schmidt, with Golder Associates. That's correct. We will use the -- the available historical period of record from Desteffany Lake, and compare it to our model.

MR. NEIL VAN DER GUGTEN: Neil van der Gugten. You also have some data for Lac de Gras water levels and discharges that's a little bit closer to the site that would also improve the confidence of the model for the actual site area, Lac du Sauvage and Lac de Gras.

Can you do the same approach with your model and the data for Lac de Gras water levels and discharges?

(BRIEF PAUSE)

MR. NATHAN SCHMIDT: Nathan Schmidt, with Golder Associates. The -- the data that we have available for Lac de Gras is -- is much shorter term. It's also seasonal. It doesn't have the -- like -- like I said in the presentation, this is actually the first year where we have monitoring over winter there.

The data, you know, that we have in the baseline was all collected well before Jay, and for different intentions. And so I don't believe that it would be appropriate, given the short-term nature of it and the -- the gaps in the record, to use that for validation.

MR. NEIL VAN DER GUGTEN: Neil van der Gugten. But there's like three (3) or four (4) years of open-water season data. You'd only be expected to compare the model to the periods where you have data for. I don't see that the gaps in the record or the shortness of record would change your ability to compare model to the data.

MR. NATHAN SCHMIDT: Nathan Schmidt, with Golder. As I said before, our -- our model is based on a derived meteorological period of record. And the conditions in any given year for that model do not necessarily correspond to the conditions that would have been experienced in that same year in the Lac de Gras watershed.

And so, over the longer term, you know, that tends to be perhaps a little more muted, a little less of a -- especially if we're considering something like exceedance curves. You know, if we have a long-term period of record, we can get a little bit of value out of that. But over a short term, I -- I don't believe that's appropriate.

MS. SACHI DE SOUZA: Okay. So I'm just going to interject here for a second. First of all, for Lac de Gras, what years do you have climate data for, and what years do you have outlet discharge rates for, or measured -- measured water levels of discharge rates from the Lac de Gras outlet?

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. Just a second, for those on the phone.

(BRIEF PAUSE)

MR. NATHAN SCHMIDT: Nathan Schmidt, with Golder. For the Lac de Gras outlet, we have some seasonal data in 1995/1996 that's continuous over several months of open-water season. For 1997, we only have some -- some manual -- four (4) manual single-point measurements that, you know, they don't provide a hydrograph. So I would say parts of two (2) years there.

And then from the more recent monitoring that's occurred there, we have seasonal hydrographs in 2010, 2011, and 2012.

MS. SACHI DE SOUZA: So I'm assuming when you're saying, "seasonal," the -- it was blocked by -- it was taken out during winter, just to confirm that?

MR. NATHAN SCHMIDT: Nathan Schmidt, with Golder. That's correct.

MS. SACHI DE SOUZA: Oh, sorry. Sachi De Souza. That's my name, with the Board. Okay. So just -- I think I'm going to be able to round this off, that what GNWT would like is a calibrated hydrologic model of the Desteffany Lake outlet calibrated to -- calibrated in the hydrographs for model versus observed.

Is that what I'm understanding here? And, where possible, for the Lac de Gras outlet.

MR. NEIL VAN DER GUGTEN: Neil van der Gugten. Yes. In -- in addition to those discharges mentioned by Golder, there's a continuous water level from 2008 to 2013, according to your Figure F-312.

MR. NATHAN SCHMIDT: Nathan Schmidt, with Golder. That's correct. In F-312, there are some water level data from the east island, the Diavik operation, only water levels, no discharges. So those, you know, while continuous, don't capture discharges. The F-311 has those three (3) years of data from 2010 to 2012, that I -- that I had indicated.

MS. SACHI DE SOUZA: Okay. Before we drag this out, what I would suggest is, first of all, we're going to make this a undertaking, because I'm assuming it cannot be done within the technical session, to calibrate the hydrologic model at the Desteffany Lake outlet for the hydrographs, and to calibrate to the Lac de Gras outlet for the years possible. And I suggest that Dominion and GNWT confirm the years that it is possible for the Lac de Gras outlet.

(BRIEF PAUSE)

MR. NEIL VAN DER GUGTEN: May I say something? I don't know if you want to ask them to recalibrate the model, but what I want is a measure --

an objective measure of the validity of the model results compared to the observed data. And if they wish to recalibrate the model, that's fine too.

(BRIEF PAUSE)

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. I -- I think what -- what Nathan was talking about -- what we're prepared to do is that validation at the Desteffany Lake outlet. Because I -- I don't think we think it's valid for the -- for -- for Lac de Gras at this point, given the amount of -- given the amount of data.

MR. NEIL VAN DER GUGTEN: Yeah. Neil van der Gugten. And is the reason that you don't think you -- you don't want to do it for Lac de Gras because you don't think the comparison or the output of that computation is going to be valid or because it takes too much time? Because if it's not going to be valid you can -- you can still do the computation and comment that this is not applicable to what you're trying to do because of whatever reason.

(BRIEF PAUSE)

MR. RICHARD BARGERY: We can -- Richard Bargery, Dominion Diamond. We can -- we can do the validation for the Desteffany Lake outlet by -- by, you know, in -- within the undertaking period by May 8th. But the other work, I guess from our perspective, you know, we don't think it adds value and it is going to take, you know, additional time and resources. So we question why we would -- we would question why we -- why would we do that work.

MS. SACHI DE SOUZA: Okay. Before we close off this undertaking is there a -- a reason that GNWT feels it's important to also do the calibration for Lac de Gras? Just to close this off.

(BRIEF PAUSE)

MR. NEIL VAN DER GUGTEN: Neil van der Gugten. Well, we think it is of value to do the Lac de Gras. If you look at the water level plots, there's a couple of significant differences in the model versus the observed. But if the Board feels it's not that important, then that's up -- that's up to you.

MS. SACHI DE SOUZA: So -- Sachi De Souza, with the Board. I can appreciate that there are some -- some discrepancies between the modelled and measured for the Lac de Gras water levels and -- and water surface elevations. I can also understand GNW -- or Dominion's point that the data might be indicative of something that's not occurring if you do, do that assessment.

So for right now I think we'd like to stick with the undertaking that Dominion complete a validation for the Desteffany Lake -- for the hydrologic model to Desteffany Lake and present those results within the two (2) week undertaking period. And that will give some information that might enlighten us as to whether -- further information is needed for Lac de Gras in the future.

THE FACILITATOR: It's Bill Klassen. And I'm asking then if there are other questions related to this topic of hydrology?

MR. NEIL VAN DER GUGTEN: Yes, Neil van der Gugten. With reference to IR-36, on stage-storage -- lake stage-storage effects, okay, I understand the vertical wall assumption that was used as a convenient way of dealing with lake storage effects, and that is reasonable.

However, for the big lakes, Lac du Sauvage and Lac de Gras, it appears that you use the vertical wall also for those lakes.

Is that correct?

MR. NATHAN SCHMIDT: Nathan Schmidt, with Golder. Yes, that's correct.

MR. NEIL VAN DER GUGTEN: Now -- but you have bathymetry for those lakes and you have a stage-storage curve up to the surface of the lake. It's very easy to use the slope of the stage-storage curve to compute actual stage-storage effects that are much closer to reality than a vertical wall.

So if you have that data, why -- why didn't you use it?

(BRIEF PAUSE)

MR. NATHAN SCHMIDT: Nathan Schmidt, with Golder. The bathymetric data that gave us that stage-storage information was -- was really collected for other purposes, for engineering design, for the fisheries assessments, for the water quality, you know, looking at things like retention time sort of thing.

If you look at those hydrographs, even the measured hydrographs of Lac de Gras, you can see, you know, very small fluctuations, like half a metre, essentially, which -- you know, with shorelines of the type that we're seeing here, the -- the difference in those surface areas would be inconsequential. So we didn't feel the need to, you know, further complexify the model by putting something like that in.

(BRIEF PAUSE)

THE FACILITATOR: It's Bill Klassen. Are there other questions on this topic? Go ahead.

MR. NEIL VAN DER GUGTEN: Neil van der Gugten. With respect to IR-37, which has to do with the modelling of the tributary basins to Lac de Gras, it's -- a different approach was used. And there was an adjustment made to calibrate the overall shape of the tributary basin hydrographs to match that of the Slipper Lake, for which data was available for 2012, I believe.

And the information presented in the calibration, Appendix F, indicates that instead of using the Slipper Lake hydrograph, which has a peak of 11 cubic metres per second, somehow the wrong hydrograph was used. It was Po -- Polar Vulture, which only has a PO of .56 cubic metres per second. And when I looked at the hydrograph for basin 9 presented as being matched to that Slipper Lake, it seemed -- the error seemed to have been propagated into that hydrograph.

And so my question is: Did you actually use the wrong hydrograph there for calibrating the other basin hydrographs, and what was the consequence of that? And -- and was that error propagated, then, through the model in its outputs? Thank you.

MR. NATHAN SCHMIDT: Nathan Schmidt, with Golder. I can confirm that the error was strictly a cut and paste error. Somebody put the wrong hydrograph in as a -- as an illustration, and nothing was propagated into the model.

If we were out by that order of magnitude, our -- our water yields at the outlet of Desteffany Lake would have been very much in error. Yeah, like divergent from the calibration. So we -- we relied on those hydrographs to provide us with a -- a typical shape for that calibration, but nothing was carried through into the modelling.

MR. NEIL VAN DER GUGTEN: Neil van der Gugten. So if I look at the actual hydrograph for basin 9, Figure F-35, it shows a peak of 29 cubic metres per second, and the area of basin 9 is how much? So my question is: How did you take account of land and lake areas to scale up the hydrographs, just...

MR. NATHAN SCHMIDT: Nathan Schmidt,

with Golder. The -- the lumped approach that we used for the -- the downstream, the Lac de Gras basin, we chose that approach. We had put a lot more detailed, you know, baseline effort into the Lac du Sauvage basin for the reasons I -- I discussed before.

When we get into the Lac de Gras basin, the -- the really important things that we're -- we're worried about, like I also said before, are the water yields, the annual water yields because, you know, that's driving. It's a -- it's an important input into the -- on the water quality modelling. So we used, you know, not as -- as complex approach as, you know, we -- we chose to do for the Lac du Sauvage basin.

To get back to your question, how we defined the runoff from the land surfaces and -- and the lake surfaces, we used the same water yields for the same years as we had already derived for the Lac du Sauvage basin. So it's -- it's, you know, consistent with that. And that's the basis for our -- for our calculations.

MR. NATHEN RICHEA: Thank you. It's Nathen Richea, Water Resources, ENR. I just have a follow-up question. So the cut -- the cut and paste error that was done, was it cut and paste -- the wrong hydrograph was cut and paste, or was it the wrong peak discharge cut and paste? Where -- where was the error that may have been made?

MR. NATHAN SCHMIDT: Nathan Schmidt, with Golder. And -- and I think one of the drivers for the -- the cut and paste mistake is that the shape of those hydrographs is the same. It's just the numbers on the Y-axis are different, which is what Mr. van der Gugten picked up on.

Sorry, I forget the actual question.

MR. NATHEN RICHEA: Thank you. It's Nathen Richea here. Yeah. I was just wondering if the cut and paste was just an error with the hydrograph itself. I guess it sounds like that might have been the issue, rather than the cut and paste on the peak discharge that might have been in text. I was just wondering where the error might have been.

MR. NATHAN SCHMIDT: Yeah. Nathan Schmidt, with Golder. Yeah, it was a cut and paste of a -- of a figure that came out of a prior AEMP.

(BRIEF PAUSE)

THE FACILITATOR: It's Bill Klassen -- Bill Klassen. Are there other questions from parties in the room before I move to staff of the Board, or the staff -- or the Board advisors?

MR. NEIL VAN DER GUGTEN: Neil van der Gugten. With regard to IR-40, the runoff coefficients for rainfall and snow melt, the response acknowledges that runoff coefficients for rainfall and snowfall are point two (.2) to point three (.3) units higher than those found in the literature. And yet at the same time it says that the runoff coefficients are considered realistic.

When I look at the annual yield for Lac de Gras, I understand it's approximately 150 millimetres. And if the mean total annual precipitation is 345 millimetres, which is adjusted for undercatch, the implied total annual runoff coefficient is in the order of point four-three (.43).

If I subtract the snowfall sublimation loss of point three (.3) times 178 millimetres, then the implied runoff coefficient becomes point five-one (.51). And those values, I -- I believe, are consistent -- are consistent with previous studies.

So the runoff coefficients used in the model appear to be 50 percent higher than the overall Lac de Gras base and values. Now, there may be some explanation for that. It is not clear to me in the literature that I could peruse. So could you please explain why they're so high compared to these? And -- and I make reference, too, to the runoff coefficients that you summarized in your literature review where the melt, for example, the snow melt, typical values are from point six (.6) to point seven (.7) and whereas you used one point zero (1.0).

So I don't understand how you can claim -- claim that they're realistic. If you could please explain that.

MR. NATHAN SCHMIDT: Okay. Nathan Schmidt, with Golder. As I said in the presentation this morning, I think what this comes down to is kind of apples-and-oranges comparisons. Oftentimes when runoff coefficients are expressed, they're based on data that are collected, you know, downstream of a lake on a -- on an annual basis.

And so I will say that the numbers that you presented there, the -- the zero point four-three (0.43) and the zero point five-one (0.51), I absolutely agree. And those are actually reflected in our model.

The Lac de Gras/Lac du Sauvage watershed is very much dominated by the open water. You can well imagine that the -- the lakes occupy 25, 30 percent of that surface area. And with an annual precipitation of say three fifty (350) and a lake evaporation of about

270 millimetres, what you can see is that we're getting very little water contribution from the lakes. The water contribution is -- is coming from the land.

And so when you smear that total drainage area, the whole basin area in there, it brings that coefficient down. So when you talk about the -- you know, the runoff coefficient at the outlet of Destaffany Lake being point four-three (.43), that's what our model gets. And to achieve that point four-three (.43), what we had do in the building blocks of the model was for land-only surfaces, we had to have our coefficients at those values.

One (1) thing I'll add to that is that the -- the sublimation factor that we included in there -- like when you think one point zero (1.0), that's -- that means everything's running off. You're not losing anything. That 30 percent sublimation, there's uncertainty in there, and there's also some uncertainty in the undercatch values.

But what happens is, when you combine all of those together, we come up with this -- this runoff coefficient, okay? So we may be a little bit high on the -- on the sublimation value, which means that we come in correspondingly high on the -- the runoff coefficient. And at the end of the day, it --

it doesn't affect the results of the model.

THE FACILITATOR: Further questions?

MR. NEIL VAN DER GUGTEN: Neil van der Gugten. With regard to IR-41, undercatch adjustments, when precipitation is collected in gauges, there is an undercatch factor because the actual precipitation is known to be higher than what is recorded in the gauge. Environment Canada has developed a -- quite a detailed set of information to make corrections for that.

And for some reason, the analysis was done using -- and -- and these correction factors vary quite a bit from day to -- from month to month and year to year. And for some reason, the analysis was done using an -- a -- a broad average value applied to each and every period that you analyzed. And in your response, you indicated that it only made a difference of plus or minus 5 percent.

But my question is, one (1), why would you not use the most accurate data you have? Because this is the main input to your model. It's the precipitation that varies from year to year and month to month. Why would you average that out when you have the actual best data available?

Secondly, if you look at the record, the undercatch adjustment changes in 1981, because they change from snow ruler measurements to nipher gauge measurements, and that's why before 1981, if you use an average, you underestimate the actual precipitation, and after '81, you overestimate the actual precipitation by using an average value. And if you look at the most extreme year, the approach of using an average value, as you did, gives you 20 percent too little snowfall and 16 percent too little rainfall for the greatest years, and not 5 percent.

So why would you use an average mean value for the adjustment when you have the actual data that represents the actual record of month by month and year by year? Thank you.

(BRIEF PAUSE)

MR. NATHAN SCHMIDT: Nathan Schmidt, with Golder Associates. You said, "20 percent." Can you point out exactly where that -- that difference is?

MR. NEIL VAN DER GUGTEN: Neil van der Gugten. In 1966, if you look at the calendar year, the adjustment factor for annual snowfall was one point five-nine (1.59), where you used one point three-two (1.32). That -- that is a 20 percent difference in the factor. And you only -- when you apply it to the actual amount of snowfall, it -- it's -- it turns out to 17 percent.

Rainfall as 1968, the actual factor is one-thirty-three (133) and the estimated factor -- average factor you used is one point twelve (1.12). That's 19 percent, so. Those are the two (2) years that represent the worst difference. Other years will be less. But nevertheless, there can be significant differences especially in the early years.

MR. NATHAN SCHMIDT: Yeah. Nathan Schmidt, with Golder Associates. I will concede that it is a simplification in the model. Some of the factors that contribute to undercatch include things like the -- the wind conditions. You know, not just the measurement, but wind conditions and other factors.

You know, this could have been incorporated in the model. I don't believe that it -- you know, at -- at the end of the day, it's not going to change the -- the assessment conclusions. You know, perhaps in a future iteration it can be done, but I don't -- I don't see the need to, you know, go back and -- and recalibrate on this.

(BRIEF PAUSE)

MR. NATHEN RICHEA: It's -- it's Nathen Richea here, with Water Resources, ENR. I -- I guess basically at the end of the questioning, we're back at the start, which is while we have some current concern about the quantification of the accuracy of the model used in the assessment report, and, you know, we've got a series of questions trying to understand how they did things and -- and how things were rationalized in the approach that they took.

But, yeah, in the end we're still looking for that information. If they could quantify that, that would help us understand, okay, what is the level of certainty that we have in the model that was used in the assessment. So hopefully that helps.

MS. SACHI DE SOUZA: So with that, if the -- the current undertaking for validation of the model will address some of your concerns related to the accuracy of the hydrologic model. Is that a fair thing to say to -- at this point in time?

MR. NATHEN RICHEA: Yeah, it's Nathen Richea, with Water Resources. Yes. Yeah, for sure.

THE FACILITATOR: It's Bill Klassen asking if there are questions of Dominion Diamond on the model? We're still focussed on that within the room. Or perhaps those who are on the telephone with us, do you have questions before I turn to the staff here?

(BRIEF PAUSE)

THE FACILITATOR: Okay. Hearing nothing from those on the telephone and not seeing any indication of further questions from parties in the room, I'll ask whether staff of the Board have -- have questions?

MS. KATE MANSFIELD: Kate Mansfield, with the Review Board. This question is relevant to the Review Board's IR number 22, and it -- the description of the baseline study area for the hydrology VC.

The first question is pretty simple. It's just if DDC could clarify that the established BSA, so the baseline study area, is the same as the established effects study area for the hydrology VC?

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. Just -- just one (1) moment on this, please.

(BRIEF PAUSE)

MS. KATE MANSFIELD: This is Kate Mansfield, for the Review Board. Just to clarify, this is probably relevant to DAR Chapter 8, page 811, I guess.

(BRIEF PAUSE)

MR. NATHAN SCHMIDT: Nathan Schmidt, with Golder. That's actually a question for hydrogeology. So I'm going to have to pass that along to Don Chorley.

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. Can you just state the question again? Sorry, I -- I lost it in the flurry here.

MS. KATE MANSFIELD: Sure, sorry. It's just -- Kate Mansfield, for the Review Board. I was just hoping for clarity that the baseline study area for hydrology VC is the same as the effects study area.

(BRIEF PAUSE)

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. We're -- we're checking on it. I don't know if there's other questions while we -- while we do that and we can come back to -- to that one. I don't know if that's a...

MS. KATE MANSFIELD: Yeah, sure. So -- this is Kate for -- Kate Mansfield, for the Review Board. So in response to the Review Board's IR number 22, DDC indicated that the baseline study area was chosen early in the project description.

So we were just hoping to clarify if the baseline study area was established prior to the removal of the Cardinal pipe from the project description, and that it was not changed after the pipe was removed from the project description.

MR. NATHAN SCHMIDT: Nathan Schmidt, with Golder Associates. I just want to clarify this is hydrogeology, groundwater, not hydrology, surface water? So thank you.

MS. KATE MANSFIELD: Kate, for the Review Board. Yes, that's correct.

(BRIEF PAUSE)

MR. JOHN FAITHFUL: It's John -- John Faithful, for -- from Golder Associates. The answer to that question was that it was established prior to -- to the -- the extraction of the Cardinal part of the project, or part of the original mine plan.

The -- but with respect to the -- to the study area built around the Jay project for hydrogeology, it's still a relevant baseline area. And so the -- the effects study area would be consistent with the -- with the baseline study area in that regard. Thank you.

(BRIEF PAUSE)

MS. KATE MANSFIELD: Kate Mansfield, for the Review Board. So then the second question then would be: Is the same also true for surface hydrology, that the baseline study area and effects study area are the same?

MR. NATHAN SCHMIDT: Nathan Schmidt, with Golder Associates. They are not the same. The baseline study area, we actually followed the Coppermine River right down to the mouth, and that was because we anticipated under the Jay-Cardinal project much greater effects in terms of, you know, dewatering and -- and backflooding.

And when it turned into the Jay project and we saw that the effects were correspondingly much smaller, we actually changed the effects study area to end at the outlet of Desteffany Lake.

MS. KATE MANSFIELD: Kate Mansfield, for the Review Board. Thank you. So given that the baseline study area and effects study area were selected with the inclusion of the Cardinal pipe in the project description, the -- the question is just: If using a smaller, more Jay-specific study area would change the determination of significance effects, given that the effects study area would be much smaller?

(BRIEF PAUSE)

MR. JOHN FAITHFUL: It's -- it's John Faithful, from Golder Associates. So -- so the reduction of the -- the study area to -- to an effects study area is really -- it's really relevant to -- to the assessment.

If there -- if the project does -- does reduce, and so the focus is on the Jay project, it's -- it's relatively immaterial as to -- to whether or not it does influence significance. The baseline study area being larger allows for the collection of a lot more baseline information and -- and for the -- a -- a lot more information with respect to -- to comparison to predicted concentrations.

The effects study area really -- really

looks at -- at the zone, or the extent to which any measurable changes as a result of the project would -- would occur. And so the -- the reduction of the study area for effects compared to the -- to the baseline study area is purely linked to -- to where you would expect those measurable effects to occur, so.

(BRIEF PAUSE)

MS. KATE MANSFIELD: Thank you. I might have a follow-up question later, but that -- this is Kate, for the Review Board. I might have a follow-up question later, but thank you.

MR. NATHEN RICHEA: It's -- it's Nathen Richea, with Water Resources, here. I wonder if I could just try to understand sort of the question and response portion there. I -- I think we're talking about assessment boundaries potentially, and discussion about what an appropriate assessment boundary might be for the expansion project, which would be the Jay project.

But I understand there's two (2) zones of impact that could happen from the Ekati operation. Obviously, there's the one that discharges from the main site of the operation down into Slipper Lake, the

Slipper Lake outlet and into Lac de Gras. But then there's also the proposed project, which happens in Lac du Sauvage, which is upstream of Lac de Gras.

And upon review of the Developer's Assessment Report, it seems like the local study area has been identified as the outlet of Lac de Gras. And I think, if I'm following the question, I think the question might be along the lines of if an initial assessment boundary could be put closer to the Jay pipe to assess the potential impacts of that operation on the immediate receiving environment that it has.

And then there would be a sorp -- a separate assessment endpoint from the operation as a whole, which might be further downstream, which might be the outlet of Lac de Gras.

Does that capture sort of the question?

And I'm not sure I understood the answer. I think the answer seemed to talk about, well, really, the only assessment point that we need to worry about is where you might measure an effect. But I don't think that's accurate in this case, given the complexity of the operation in the receiving environments that were -- that we're going to see from this operation.

So I wonder if we could just sort of

flesh that out a bit further and maybe try to understand some of the rationale for the different assessment boundaries that are proposed in the Developer's Assessment Report.

(BRIEF PAUSE)

MR. JOHN FAITHFUL: It's John Faithful, from Golder Associates. If we use water quality for -- as an example, Nathen, you know, we -- we have an assessment boundary that encompasses both -- both Lac du Sauvage and Lac de Gras through to the outlet of Lac de Gras.

We don't focus our total assessment on potential effects to -- to those lakes at only just the outlet of Lac de Gras. The assessment case takes into account the changes that occur in Lac du Sauvage. They are -- they are more immediate around where the -- the pit development is occurring, but it also extends into -- into Lac de Gras.

And -- and there is various assessment nodes through Lac du Sauvage that extend through to -- to Lac de Gras that also account for project effects, as well as the cumulative effects that it may have on the other ongoing operations.

THE FACILITATOR: Do you have -- it's Bill Klassen -- a follow-up or a response to this? Or -- Kate, I'm -- I'm afraid I've lost track of who's asking the questions here. So let's try to get a little focus here, at least for my benefit.

MS. KATE MANSFIELD: This is Kate Mansfield, with the Review Board. Thanks, John. Could you please just clarify one (1) point that you said there? So the measurement indicator and therefore the way that you would determine significance of an effect is measured at the Lac de Gras outflow for surface hydrology?

(BRIEF PAUSE)

MR. JOHN FAITHFUL: It's John Faithful -- John Faithful, for Golder Associates. I'm going to initiate the answer. I'm going to talk about the significance part, and then I'm going to pass it on to -- to Nathan, who's going to respond to the hydrological component of the assessment.

So for Section 8, water quantity and water quality, in evaluating significance, we -- it comes down to that assessment endpoint that I talked about in our presentation.

It's really -- the important part of -- of determining the influence of this project on the receiving environment is whether or not there is a -- there's -- that water quality remains suitable to provide for functioning, healthy aquatic ecosystems, and that the -- that the use of that water is still maintained for -- for whatever terms, wildlife use, human use, traditional use, okay?

So we take into account all the elements that feed into that potential assessment endpoint. So we have hydrogeology that is linked to -- to the watershed through the pit development that results in -- in groundwater inflows that have to be managed that aff -- that potentially influence the surface water in Lac du Sauvage and Lac de Gras through pumping discharge.

We look at the -- the hydrological changes, whether that's water levels, water flows, how that impacts upon whether or not that assessment endpoint is -- is protected. And then ultimately water quality, which -- which is used -- where -- which -- which is effectively changed by the project activities through hydrology and hydrologic -- and hydrogeological inputs.

Okay. So all of that is integrated in

terms of allowing us to start to evaluate whether there is a significant adverse effect to the receiving environment. We utilize protection of aquatic life guidelines. We use aquatic health benchmarks. We use drinking water qual -- guidelines -- drinking water guidelines to evaluate what our predicted water quality conditions are to determine whether or not there is a risk of an adverse environmental effect or a risk to our assessment endpoint not being achieved. Okay.

So I'm -- I'm going to pass it on to -- to Nathan now, and he can -- unless I've already answered your part of the question, Nathan.

MR. NATHAN SCHMIDT: Nathan Schmidt, with Golder Associates. And I just wanted to clarify that with the hydrological assessment we -- we do assess it at multiple nodes where there are project defects that could be experienced. For instance, Desteffany Lake outlet, Lac de Gras outlet, Lac -- Lac du Sauvage outlet and then the -- the smaller tributaries that are, you know, in the -- in the project footprint area.

And so we pass that information on to water quality and to the other disciplines for them to integrate those effects into their assessment.

MR. JOHN FAITHFUL: So it's -- it's

John Faithful again. Thanks for that, Nathan. I guess one (1) -- one (1) part that I -- that I should have got to that I didn't get to in my response is, so, we evaluate these changes from -- from the project through the operations and -- and into post-closure. We examine within the effects study area that we're focussing on. We look at -- we look at if -- if there are changes that are going to potentially approach these -- these thresholds that we use to -- to determine where there is -- there -- there is risk.

We look at the magnitude of the change. We look at the geographical extent of -- of any change and we look at -- at the duration. There's a number of key classifiers that are used in the determination of significance and they call come into play. The -- the fact that we use these protection guidelines as our -- as our benchmark is appropriate to evaluate risk. We look at the -- that the duration that any of these changes may occur and -- and whether or not there is -- there is heightened risk. That's the -- that's the critical piece in terms of where we determine whether or not significance. It's the change that we see is a significant change.

(BRIEF PAUSE)

THE FACILITATOR: Okay. Thank you. It's Bill Klassen. We have other topics that I would like to hear if there are any questions on. And so I'll ask Sachi to take us to the next one (1).

MS. SACHI DE SOUZA: Sachi De Souza, with the Board. So I've -- there were a number of IRs, one (1) of which was from the Review Board number 47 related to the possible effect of wet and dry years on the predictions, the hydrologic predictions for Lac de Gras and Lac du Sauvage. And they were done for an average climate and with the understanding that an average climate was suitable. In the response to number -- number 47 you provided what the change in the baseline would be for the yield for non-average years.

So first of all I'm assuming that a 3 percent reduction in yield would be a 3 percent reduction in the discharge?

MR. NATHAN SCHMIDT: Nathan Schmidt, with Golder. That's correct. The mean annual discharge.

MS. SACHI DE SOUZA: Sachi De Souza, with the Board. The next question is so you've -- on this table it -- it shows that for a -- a dry event of a one (1) in twenty (20) year event you would see a 7 percent reduction in yield.

My interpretation of that is that that would -- is what would happen after one (1), one (1) in twenty (20) year event. I think what the -- the long-term concern here is, what happens over a series of those years? And from your -- the response I kind of captured, what would have to -- after naser -- after a series of -- of wet or dry years, and how that would be propagated in Lac du Sauvage and Lac de Gras?

(BRIEF PAUSE)

MR. NATHAN SCHMIDT: Nathan Schmidt, with Golder Associates. The modelling that we did for that assumes that the pumping rate will occur at the rate that is -- at rates and durations that are presented in the Water Management Plan.

We haven't considered any mitigation in there for potential dry conditions. And in advance of any backflooding, there would need to be a plan developed to set trigger levels, you know, identify conditions where you would throttle back the pumping or suspend pumping.

And so, you know, the intent isn't to, you know, have successive dry years where we just keep the pumps going. The intent would be to, you know, come up with something that would be compatible with, you know, and non-adverse effects.

MS. SACHI DE SOUZA: Sachi De Souza, with the Board. So related to that, for the Board to understand the potential significant adverse impacts, it -- it does need to understand what those -- what those are with and without the Jay -- or conditions with and without the Jay project so that if the Jay project is potentially having to backflood during dry years, we do have an understanding of that.

And something that would help for the Board's understanding is a presentation of -- of the key discharge points, so for example, the Lac du Sauvage outlet, the Lac de Gras outlet, and how those -- those discharge levels or water surface elevations would change or would -- yeah, would change in -- with a series of different scenarios. So a series of wet years, a series of dry years.

Because what will happen is when you show the WWHPP project scenarios, in order to understand the potential effects, we need to see that comparison. Is that -- have I explained that properly?

(BRIEF PAUSE)

MR. NATHAN SCHMIDT: Nathan Schmidt, with Golder Associates. First of all, I -- I'd like to make the point that we will have many years of data collection, for instance, at the narrows, you know, during the project before we get to the -- the backflooding period when these things will become relevant.

And I -- I guess we just want to reiterate that these are -- this backflooding flow is a managed flow, and that absolutely it could be managed to avoid, you know, dropping and causing an adverse effect at those locations.

And so, I mean, I guess what you're asking for there, we're trying to answer it qualitatively and say, We're not going to run into that situation. It would simply extend the backflooding period if we had successive dry years of -- of flow at those locations.

MS. SACHI DE SOUZA: Sachi De Souza, with -- with the Board. Keeping on the theme of -- of what would be an adverse effect, I have -- I have two (2) questions for you. The first of which is: At what elevate -- water surface elevation in -- in Lac -- in the narrows is -- is fish passage not going to happen, would it not happen?

And second of all -- because that's -- that's what I'm thinking is a potential adverse impact, here. And beyond that, I guess, what are -- what are Dominions -- what would Dominion consider an adverse impact for this hydrology point of view?

(BRIEF PAUSE)

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. So as -- as Nathan said, if it's an issue of -- of the back -- you know, the -- the effect on water levels because of backflooding, which we have control over, that's one (1) issue. If it's an effect on water levels because of a succession of -- of dry years, which we don't have any control over, I'm just trying to -- to narrow and -- and identify exactly what you're asking for, Sachi.

Is it -- is it an issue of how much water we're drawing to backflood the -- the pits, because we have control over that. And as -- as Nathan said, I mean, we're -- we're not going to do anything that would compromise the integrity of the lake. During that period, we'll have many years of -- of data and monitoring while Jay is operational. And, you know, we have flexibility in terms of how long it would take to backflood -- backflood the diked areas.

So -- so, you know, we think there are solutions there. I mean, it's a matter of -- of adjustment, but -- so is that the question? Is it based on our backflooding, or if it's just a -- a general question about what happens if there's a suc -- succession of dry years and what it means for -- for the narrows?

DR. NEIL HUTCHINSON: Neil Hutchinson, for the Board. I -- I think the question here relates to, you -- you said that if several dry years were to occur in a row and -- and there was more of an effect on lake level than you're predicting here, you would manage to avoid that.

I guess the question is, is what would trigger that management? How would the Board know when the water levels drop so far, what you would consider would be an average effect that you'd have to manipulate your pumping level for?

(BRIEF PAUSE)

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. I -- I guess from our understanding, those types of limits would be set during the water licensing phase of -- of the regulatory process. I don't think we can say, at this point, you know, what that limit would be or what -- what our view on that limit would be right now.

DR. NEIL HUTCHINSON: Neil Hutchinson, for the Board. I'm thinking of the Wek'eezhii Land and Water Board, who would be regulating this, their response framework, which you set a series of action levels that you anticipate and manage, so you never get to a significance threshold.

The question is, we have to understand what the significance threshold that is coming out of the EA process to -- to feed that next step.

MS. SACHI DE SOUZA: Sachi De Souza, with the Board. Just to add one (1) more piece of information to that, it -- this threshold we're looking for, it -- it can be quantitative in terms of a level, but it can also be qualitative.

(BRIEF PAUSE)

MR. RICHARD BARGERY: Yeah. Richard Bargery, Dominion Diamond. We're going to take this one under advisement with -- with respect to the -- the specific answer, and we'll get back to you before the end of -- the end of -- of the -- the technical sessions likely, yeah, on this issue.

MS. SACHI DE SOUZA: So Sacha De Souza, with the Board. To get some clear wording on this, Dominion is going to investigate at what threshold for the water surface level or the narrows would indicate a trigger for action levels for operations. I worded that terribly.

The -- Sachi De Souza, with the Board. So what the trigger would be for -- for backflooding.

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. I think generally, yes, that's -- is the commitment. I -- I think we -- we know what -- yeah, what -- what was asked. So we'll -- we'll take that away and -- and come back with an answer.

THE FACILITATOR: It's Bill Klassen. At the end of the day, of course, there will be a wrap-up of what the various responses are that -- that will be on the list.

We've been at this now for about an hour and a half. I suggest we take a short break, and then we'll come back and continue the discussion, a short break being ten (10) minutes.

--- Upon recessing at 2:10 p.m.

--- Upon resuming at 2:25 p.m.

THE FACILITATOR: Okay. Would everyone take their seats? And I will ask Sachi to introduce the next topic. We're -- we're now on site water management and closure, and we will get it on the screen here.

(BRIEF PAUSE)

MS. SACHI DE SOUZA: It's Sachi De Souza, with the Board. I want with -- the conversation will -- discussion will start with site water management. And the first item will be the waste rock storage area. And I will leave it at that.

THE FACILITATOR: It's Bill Klassen. So we have site water management and closure and -- and initially site water management with respect to waste rock storage area and seepage therefrom. Are there questions of -- of the Developer on that topic? So waste rock storage area seepage. I see no interest in that in -- in the room.

Is there anyone on the telephone that has an interest in asking any questions related to waste -- site water management and waste rock storage area seepage?

MS. SACHI DE SOUZA: Peter Unger.

THE FACILITATOR: Peter does. Okay. Thank you.

(BRIEF PAUSE)

MR. PETER UNGER: Hi. Peter Unger, Lutsel K'e. I -- I asked this yesterday by mistake. I had thought I had missed my opportunity. It's just a very quick question. I asked earlier about the waste rock storage area and -- and the possibility of it thawing out. I was a little bit curious.

What are the risks of seepage, were it to thaw out? And I noticed that you did account for some climate change scenarios, but you used scenario A1B for greenhouse gas emissions which is the -- the more moderate scenario. And you discounted scenario A2. And I was curious -- which is the high emission scenario which would, of course, lead to a more dramatic change in climate.

I was curious to know what your justification for dismissing scenario A2 is and -- and again my original question is, is were the waste rock storage area to thaw out, what is the risk of seepage?

Thank you.

MR. MICHAEL HERRELL: It's Mike Herrell, from Golder Associates. So the site water quality model was developed for -- that included the -- the Jay waste rock storage area. And the drainage from the Jay waste rock storage area during operations was directed to the -- the Misery -- the upper layer of the -- the Misery pit and then subsequently discharged to -- to Lac du Sauvage. And in closure it does drain directly to Lac du Sauvage.

The predictions in -- in the site water quality model don't account for freezing of the pile. So effectively the water estimates that were evaluated as part of the site water balance model conceptually account for a climate change scenario. So the volumes that would be estimated don't account for freezing in the pile. So any effects from not freezing of the pile on -- on water quality in -- in the downstream receiving environment have been accounted for in the DAR.

MR. PETER UNGER: Peter Unger, Lutsel K'e again. So that answers my first question. Thank you very much. And then basically I'll guess will answer the previous.

So you just did not deem it necessary to look at a higher emission scenario in terms of cli -- climate change? You didn't see that as having any potential effect?

MR. MICHAEL HERRELL: It's Mike Herrell, from Golder Associates. Yeah, we -- the assumption is that it's already thawed so there -- that is -- that scenario is already accounted for.

MR. PETER UNGER: Thank you very much.

DR. NEIL HUTCHINSON: Thanks. Neil Hutchinson, for the Board. Mike, I just wanted to clarify. You -- you're saying that all of the waste rock storage area drains to the Jay pit and the sump and none of it to the natural environment? We were kind of confused. We get different opinions.

(BRIEF PAUSE)

MR. MICHAEL HERRELL: It's Mike Herrell, from Golder Associates. Just to clarify. So during operations the -- the drainage from the Jay waste rock storage area goes to the Jay -- Jay sump which is then pumped to Misery and Lac du Sauvage. And at -- in post-closure it drains directly to Lac du Sauvage.

DR. NEIL HUTCHINSON: Neil Hutchinson,

for the Board. So I -- I presume -- and some -- somehow the Closure Plan includes monitoring for seepage and -- and initiatives to -- to manage that seepage if it becomes a problem?

MR. ERIC DENHOLM: Yeah, it's Eric Denholm speaking. Yes. Closure plan provides for a nominal ten (10) year monitoring period for each -- you know, according to each reclaimed mine component.

MS. SACHI DE SOUZA: Sachi De Souza, with the Board. For the portion of the pile that's to the north, it's going to be -- is there going to be a sump over there on that side, or is there a tow drain to collect it and move it to the -- the diked area, or what's the plan?

(BRIEF PAUSE)

MR. MICHAEL HERRELL: It's Mike Herrell, from Golder Associates. So that -- that assumption was carried forward into the model, so it's the contingency plan that it would be pumped to Misery -- or to the Jay sump during operations. However, it'll be monitored during operations, and if it meets the -- the discharge water quality criteria that's set as part of the water licence, then it will -- that --

that proportion of the pile will be discharged to Lac du Sauvage.

MS. SACHI DE SOUZA: Sachi De Souza, with the Board. I'm going to go down a line of questioning from that. Some of these questions are -- are from the Board's technical advisor for geochemistry, so I'm going to be asking them on -- on their behalf.

So the first question is related to the monitoring of that seepage. From what I understand, it's going to be monitored during the -- the freshette, so in the -- the first summer freshette, and then also once in the fall.

Is there an intention to monitor more frequently than twice a year to confirm that there isn't seepage being produced, and that it's not being released into the downstream environment?

MR. ERIC DENHOLM: Yeah, it's -- it's Eric Denholm speaking. So the -- the twice per year comes from the established Waste Rock and/or Storage Management Plan, and it has a seepage monitoring protocol in it that would be applied to the Jay waste rock storage area. So it's -- that's where the -- the twice per year comes from, and that's what is antici -- is anticipated and planned.

There have been times where if there's a -- a specific purpose and a need that can -- on a -- as part of an adaptive management plan, then that can include additional sampling where needed.

MS. SACHI DE SOUZA: Sachi De Souza, with the Board. The existing plan for monitoring is -- is based on the existing Ekati operations, and my understanding is that for the most part, you're not experience -- you're not seeing a lot of seepage.

Are there pits -- or waste rock piles, sorry, that are showing more seepage than originally estimated? And I'm thinking about the -- the Pigeon pile that was referenced in -- in the IR responses, and ongoing work right now that's at the Land and Water Board for the pox -- Fox waste rock pile. And -- I'll leave it at -- there.

(BRIEF PAUSE)

MR. ERIC DENHOLM: Yeah, it's Eric Denholm speaking. So just -- just on a -- a slight correction. The Pigeon pile is just now under -- starting under construction, so it's not constructed as yet, I think.

But what I'd say is -- is, So -- so

currently there's no -- there's no seepages from -- from any of the Ekati rock piles that's requiring active intervention, or management in some ways. So -- yeah. Thanks.

MS. SACHI DE SOUZA: Sachi De Souza, with the Board. I'll -- I'll leave that, and I'll just go through this list of questions from geochemistry, if that's okay? There's about six (6), and I'm just going to read them word for word so I don't get them wrong.

So the first question is -- this is related to seepage and the potential for -- for metal leaching or acid rock drainage from the waste rock storage area for the Jay Pit -- for the Jay pile:

"Since the metasediments, sediments, granite, and dye base for the Jay project have been described to be similar to the waste rock from the other Ekati operations, it is likely that seepage water quality data from the waste rock storage facilities would -- would be a great proxy for projecting seepage water quality for the Jay waste rock storage area."

Have other waste rock storage facilities been in place long enough, five (5) to ten (10) years, where the geochemical processes to affect seepage discharge, and if so, what are the water quality characteristics?

And as a follow-up to that, is there seepage water quality data for these other facilities?

MR. MICHAEL HERRELL: It's Mike Herrell, from Golder Associates. I -- I agree with that statement. It is a great proxy and that's effectively what we've done in the modelling. We've used the -- the Misery waste rock storage area, since that's the -- the closest composition to the -- the Jay storage area, as a proxy for -- for inputs into the -- the water quality modelling.

In terms of the data that's used -- or if there is seepage data available, yes, there is seepage data available. And I -- I think to -- the -- the most direct response to that question, if they're looking for data, in Appendix 8E of the DAR, the input for the waste rock storage area is summarized in there. I'll -- if you -- I'll just pull out the table number there.

So that's in Table 8E3.4-1 of Appendix 8E of the DAR.

MS. SACHI DE SOUZA: Sachi De Souza, with the Board. The second question is:

"Is the construction of field cells
lined pads with different
configurations, materials, and
instrument -- instrumentation
designed to collect seepage and
monitor temperature conditions being
considered as part of operational
monitoring for the Jay project?"

(BRIEF PAUSE)

MR. ERIC DENHOLM: It's -- it's Eric Denholm speaking. There's no -- there's no plans and we don't see the need for -- for those types of long-term research tests. We've got actual operating data and actually -- actual operating rock piles at the Ekati site. And so we wouldn't see any -- any value for -- for Ekati or for the Jay project in those types of long-term research tests.

MS. SACHI DE SOUZA: Sachi De Souza, with the Board. The next question relates to the -- not directly with the geochemistry, but for -- on day 1 the lakebed sediments are going to be excavated and trucked off the diked area and put in the vicinity of the waste rock storage area to dry.

First of all, are there dust and water quality concerns related to that silt? Second of all, could that silt be -- how will that silt be utilized in the construction of the waste rock storage area, or will it be used in any way to enhance the waste rock storage area?

MS. FIONA ESFORD: This question is -- it's Fiona Esford, from Golder. This question is very similar to a question we answered on Monday related to the silt from -- from the excavation activities. And if the quarry is developed as part of the dike development we'll use the quarry for the storage and placement of that silt material. And -- and if we do not develop the quarry it will still be placed within the waste rock storage area footprint and -- and cells would be developed with some -- some rock around it to ensure that it's placed in a stable manner.

And dust or water quality issues are not anticipated.

(BRIEF PAUSE)

MS. SACHI DE SOUZA: Sachi De Souza, with the Board. The next question is:

"Has there been any quantitative

seepage water quality assessment,
mass balance assessments, and flow
estimates based on different freezing
scenarios?"

MR. MICHAEL HERRELL: It's Mike Herrell, from Golder Associates. As -- in response to Peter's question earlier, the -- the assumption in the model is that the -- in the site water balance is that the -- the pile will not freeze, and it's the -- the runoff and seepage estimates, use that as an assumption into the model.

As for estimates of water quality, we used the Misery seepage data as a proxy, so we didn't estimate water quality from the pile. We applied a water quality to the drainage from the pile.

MS. SACHI DE SOUZA: Sachi De Souza, with the Board. The last question here is:

"Do the results of the ARD analysis
or management plans change if the
carbonate neutralization potential is
used to estimate PAG or non-PAG
behaviour as opposed to the bulk
neutralization potential?"

(BRIEF PAUSE)

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. It's going to take us a little while, I think, so we're going to have to -- we're going to have to come back with -- and look that up and come back with an answer on -- on that specific question.

MS. SACHI DE SOUZA: Is that a homework or undertaking for you guys?

MR. RICHARD BARGERY: Let's call it homework.

MS. SACHI DE SOUZA: Sachi De Souza, with the Board. So to clarify, the wording is -- the question was:

> "Do the results of the ARD analysis or management plans change if the carbonate neutralization potential is used to estimate PAG or non-PAG behaviour as opposed to the use -- opposed to using bulk neutralization potential?"

MR. RICHARD BARGERY: Yeah. Richard Bargery, Dominion Diamond. Yeah, that's -- that's the question. But at the end of the day, we'll come back to the actual wording on the screen, I'm sure, and -- and we -- after we have a discussion, we can talk a little bit more about if it's homework or -- or an undertaking, depending on who we need to -- to discuss that with.

MS. SACHI DE SOUZA: Sachi De Souza, with the Board. Just a follow-up to Eric's response about the -- the monitoring. One (1) of the concerns I think related to the monitoring of seepage is the proximity to Lac du Sauvage and the importance of Lac du Sauvage to traditional users and people in the area.

So would it be reasonable to do seepage or testing more frequently, or would that still all come under the adaptive management approach?

(BRIEF PAUSE)

MR. ERIC DENHOLM: Yeah, it's -- it's Eric Denholm speaking. I think -- I think we -- we had -- we had relied to a large extent on the current approach in the WROMP has been tried and trued and proven up and -- and has worked well.

Those who are familiar with it know that a lot of time, there are -- in a lot of these seeps, there aren't -- isn't water to sample twice a year, I mean. So we keep in mind that a lot of the times it's only a -- spring is only -- is the only time that there's any water to sample.

And also as a reminder, there's all the -- the seepage program already does have this adaptive management component that often one (1) of the early steps is to -- to do increased frequency of sampling.

THE FACILITATOR: It's Bill Klassen. Are there any further questions related to the waste rock storage area seepage topic? Tim...?

MR. TIM BYERS: Tim Byers, with the Monitoring Agency. My question is in relation to the proximity of the waste rock storage area to major water body.

And so my question is: You have a buffer zone of 100 metres to Lac de Gras itself. And as I stated -- or as we stated in -- in IR, we're concerned that there's only a 30 metre buffer between the wet rock pile and a stream that flows into Lac de Gras. I'm not sure if that's an intermittent stream or not. Or, sorry, Lac du Sauvage, into Lac du Sauvage. I don't know if that's an intermittent stream or not, but it's on the north side of the proposed rock pile.

And so I'm wondering, would there not be a greater potential for seepage entering Lac de Gras through a -- sorry, I did it again -- Lac du Sauvage through a stream at 30 metres' distance as opposed to directly at 100 metres' distance?

(BRIEF PAUSE)

MR. TIM BYERS: I -- I'm sorry. Could we put slide 4 of the presentation? Because I think it's a very good map of that rock pile and its proximity to the stream. Thanks.

(BRIEF PAUSE)

MS. FIONA ESFORD: Fiona Esford, Golder Associates. Just for reference, like, 30 metres is -- is more than the width of this room, and -- and so we feel that 30 metres is adequate. If seepage water quality indicated that we need to -- to implement adaptive management and -- and collect that seepage, we have adequate space in order to do that before it entered the receiving environment of that stream.

MR. TIM BYERS: Tim Byers again, with the Agency. So does that mean a potential contingency is to dig a collection ditch on that north side to collect any potentially contaminated seepage from entering the stream?

MS. FIONA ESFORD: Fiona Esford, Golder

Associates. That would be one (1) of many potential options, depending on the volume and the quality of water as to how the water would be captured and -- if necessary.

MR. TIM BYERS: Thank you for that. My colleague reminds me that looking closer at this map, there is -- seems to be a fairly steep grade at that northern most point. And I'm not sure if that will influence your perception of the potential for seepage entering the -- Lac du Sauvage through that stream. Thank you.

(BRIEF PAUSE)

MR. KEVIN O'REILLY: Sorry. It's Kevin O'Reilly, with the Agency. I guess the other point that we would like to add, too, is that I believe for virtually all of your other waste rock piles, except possibly for Pigeon, you rely on permafro -- permafrost encapsulation. This one, that's not the case. And given its proximity to a major water body and steep contours, the proximity to a -- a stream that runs close to it, I just wonder about making sure that seepage, if it does happen, doesn't become a real problem. Thanks.

MS. FIONA ESFORD: In terms of the water quality modelling, both inputs and -- and seepage quantities, we assume that it doesn't freeze. However, the way the pile is managed, we will do everything to promote permafrost into it -- developing into the pile, and we still would like permafrost and expect that permafrost will grade into the pile.

MR. KEVIN O'REILLY: It's Kevin O'Reilly, for the Agency. Has DDC actually identified locations, then, where you would put in thermistor cables in the waste rock pile to look at -- or so that you could monitor and make sure that encapsulation is actually occurring, especially on the north side of the waste rock pile next to the stream and next to Lac du Sauvage? Thanks.

MR. RICHARD BARGERY: It's Richard Bargery, Dom -- Dominion Diamond. Are you asking have we identified the locations, or it -- or whether we will do that? Because the answer to that -- if it's locations, no, we -- we haven't identified locations yet. But we take your point on -- on those -- those areas that you pointed -- those two (2) areas you pointed.

MR. KEVIN O'REILLY: Thanks. Kevin O'Reilly, with the Agency. Yeah, we -- we noted in your response to IR-22 that you do intend to have thermistor cables in there, but it didn't say where or when, and so on. So if you have any additional details on that, that'd be helpful, but...

(BRIEF PAUSE)

MR. ERIC DENHOLM: Sorry. Eric Denholm speaking. So -- so the -- the water licence requires a waste rock storage area design report submitted to Wek'eezhii Land and Water Board, and that's where we'd suggest that information would be appropriately provided.

MR. KEVIN O'REILLY: Thanks. Kevin O'Reilly, with the Monitoring Agency. Yeah, we understand that process well, Eric, and we've participated in it.

I guess, though, the issue here is, Is this something that the Review Board should be flagging for the Wek'eezhii Land and Water Board in terms of giving some guidance, or even some direction to the Company as to where monitoring of the waste rock pile should take place? So I guess that's the issue.

(BRIEF PAUSE)

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. I -- I -- the way it was phrased, anyway, I think that's a question for the Board, you know.

MR. MARK CLIFFE-PHILLIPS: Mark Cliffe-Phillips, with the Review Board. As we mentioned yesterday, for registry items that are being referenced by the Company, there's opportunities for the Company to submit that to the registry. Other parties also have the opportunity to submit documents that are on a public registry for the WW -- WLWB, or -- or any other relevant materials you could submit to the Board, and the Board would post that onto the registry. People could comment on the relevancy and application after that time.

MR. KEVIN O'REILLY: Thanks. Kevin O'Reilly, with the Agency. I guess -- I don't want to drag this out any longer than it needs to be, but DDC could also make a commitment to ensure that there's adequate thermistors placed in -- on that side of the waste rock pile to make sure that permafrost encapsulation takes place. So you can make a commitment, as well. You don't have to wait for the Review Board.

MR. RICHARD BARGERY: Richard Bargery,

from Dominion Diamond. I -- we take the point, I guess. That's -- that's what I'd say at this point.

THE FACILITATOR: Okay, thank you. Could we have the agenda back on the screen to help my memory with where we are right now? We're still on site water management, and we've dealt with the waste rock storage area seepage. So now we're moving on the effects of wet and dry climate.

We've had a bit of a discussion on one (1) aspect of wet and dry years, but I wonder if there are questions related to site water management, specifically on the effects of wet and dry climates?

MR. NEIL VAN DER GUGTEN: Neil van der Gugten. My -- my understanding is, and please -- please, confirm or correct me if I'm wrong, but the only water management component that seems to be sized for anything other than average climate and runoff conditions, that I could find, is the Jay runoff sump. And it is -- it has excess capacity to handle a single twenty-four (24) hour one (1) in ten (10) rainfall event.

Other than that, I'm not aware of -- of any other components that are designed or the -- where contingencies have been planned or provided for wet years or sequences of -- of wet years over the -- that are reasonably probable over the life of the project. Thank you.

(BRIEF PAUSE)

MS. FIONA ESFORD: Fiona Esford, of Golder Associates. Just for clarification first, you're referring to the water management aspects and -- and not so much the sub-basin B diversion channel. Is that correct?

Fiona Esford, of Golder Associates. The water management structures, the sumps are internal within the diked area. And so that itself, along with the Jay pit and the Misery pit, have sufficient capacity themselves with freeboard to tolerate those cycles.

THE FACILITATOR: It's Bill Klassen. Are there further questions on this topic?

(BRIEF PAUSE)

THE FACILITATOR: Is there anyone -- sorry, I've got -- thank you. Go ahead.

MR. NATHEN RICHEA: Thank you. It's Nathen Richea, Water Resources Division, ENR. I was just going to follow up on a previous conversation that I may have missed. But I think there was some conversation before the break about the potential for dry years affecting water levels between Lac du Sauvage and Lac de Gras. And an important component of that would be the narrows between the two (2) lake systems.

And I think there was a question to the Operator on what the potential water level would be, the minimum water level to allow at least a connection between Lac du Sauvage and Lac de Gras. And I think it's relevant here, again, because of the effect of wet and dry years on the operation.

And I'm just wondering if there's something that can be revisited on that discussion point. I think it's important. It's important from and assessment standpoint in trying to determine whether if a certain water level would be -- cause an impact to the narrows if it was drawn down through a series of wet or dry years, probably the dry more so would be a concern, during the course of the operation.

So I'm just wondering if we could revisit that discussion and -- and maybe come up with some sort of resolution to, sort of, that component?

MS. SACHI DE SOUZA: Yeah, so Sachi De Souza, with the Board. That's -- that's right now an -

- an undertaking. I'll let you guys...

(BRIEF PAUSE)

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. So I -- I think we've made an undertaking -- a homework assignment, and under -- one (1) -- some -- one (1) of those things. I can't remember what we -- what we said for that particular one about the minimum -- minimum levels in -- in the narrows during backflooding, which would be the only time we would be using and drawing water.

MR. NATHEN RICHEA: Okay. Thank you. It's Nathen Richea, with Water Resources. I must have missed that part, because I thought there was no resolution to that point. So I apologize.

THE FACILITATOR: It's Bill Klassen. Are there other questions then related to wet -- wet and -- the effects of wet and dry climate on, let's say, water management. Are there any questions on --

MR. NEIL VAN DER GUGTEN: Neil -- Neil van der Gugten. Yes, I just have one (1) more question.

THE FACILITATOR: Yes.

MR. NEIL VAN DER GUGTEN: And this

relates to information in the Mine Water Management Plan, Appendix E, where there's a table of a water balance model input parameters. It's Table B3. And I just request a clarification on that table, the first row. It talks about precipitation and it talks about precipitation from October to May stored and released in June over a period of one (1) month. So I understand that is the snowfall accumulation which melts in June. And then it says:

"Equivalent to a 33 percent runoff coefficient under average conditions."

And I'm not sure what that means. Could you explain that please?

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. For those on the phone, we'll just take a moment to -- to look up that specific table.

(BRIEF PAUSE)

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. I don't think we have the right -- the right person here to -- to give that answer quickly. So we'll -- we'll contact that person and -- and get an answer -- answer for you on that specific question.

MR. NEIL VAN DER GUGTEN: Neil van der Gugten. Thank you. And just one (1) more item on the table. Under runoff coefficient for undisturbed area, it says point seven (.7) -- zero point seven (0.7) for June and point five seven (.57) from July to September. So I'm assuming the point seven (.7) in June again refers to snow melt runoff.

So I'm wondering how that number compares to the 33 percent mentioned just a moment ago and how -- why that is different from the one point zero (1.0) runoff coefficient for the regional model. Thank you.

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. Okay. We'll -- we'll add that. So we'll get back to you on -- on the table, hopefully in -- in the morning.

MS. SACHI DE SOUZA: Okay. So the homework question is to clarify values in Table B3, from Appendix 3A from the DAR.

THE FACILITATOR: It's Bill Klassen again, on -- on the topic of wet and dry climates and the effects on site water management. If there aren't any more questions on that, or at least generally, then I'll ask Sachi to -- to ask a question and move us into the next topic.

(BRIEF PAUSE)

MS. SACHI DE SOUZA: It's Sachi De Souza, with the Board. Before -- before moving directly into the -- the conversation of the effect of wet and dry years, I want to have a conversation about the site water balance model for the Jay project. And part of it stems from how climate was considered in the model. And part of it is related to the output from the -- the water balance model. So I'll put this up to start.

The first question -- so the first question I have is: Were standalone models done for the Jay project and is there a standalone water balance model for the site? And this relates to MVEIRB's IR number 5. And I guess my overall goal of this line of questioning is to understand the accuracy of the water balance model and the accuracy of the predictions to understand the effects for storage and the effects downstream.

(BRIEF PAUSE)

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. Could -- Sachi, could I ask you just to restate your question, and -- and particularly the part about the accuracy and -- and what exactly you're looking for there?

MS. SACHI DE SOUZA: Sachi De Souza, with the Board. I, in trying to review the -- the water balance model, didn't have a water balance model to actually look at. I have responses from (sic) the Water Management Plan and responses to the IR. And I was -- I was hoping through the IR to actually get the standalone water balance model.

(BRIEF PAUSE)

MS. SACHI DE SOUZA: If I -- I'm just going to interrupt and maybe this will help a bit more. So one (1) of the reason I had -- I have the questions I have is in the Site Water Management Plan -- this is Appendix 3A -- you provided the Misery pit outflows and volumes for the water balance model.

So on this blue line, you -- this is the Misery pit volume, and the green and the red lines represent flow rates, so the green lines being what's being pumped to Lac du Sauvage, and then later what's being pumped from the Misery pit to the Jay runoff sump.

One (1) of my points of confusion is that my understanding is that the duration for this red line should match the duration from this drop of the blue. The drop in the Misery pit volume should match the point -- the -- the time that water is being pumped out of the Misery pit into Lac du Sauvage -- into the Jay pit diked area for closure.

And I'm confused about why the durations don't line up.

(BRIEF PAUSE)

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. I think that's going to -- Mike tells me it's -- it's going to just take a little bit of time and it's going to require referencing a number of things to -- to answer the specific question about why the difference here.

So it may be tomorrow morning that -- that -- once we have the chance to -- to deal with the various reference -- documents. So that's going to have to be -- one (1) sec.

THE FACILITATOR: It's Bill Klassen,

Richard. Are you saying that you need some time right now and you can do it, or you need more time than --

MR. RICHARD BARGERY: Richard Bargery. And the table number would be helpful here, the -- the figure number.

MS. SACHI DE SOUZA: It's Sachi De Souza, with the Board. So I'm looking for a clarification on Figure 6-3 and also on Figure 6-6 -- I can get there very slowly -- that are in the Appendix 3A to the DAR, the Site Water Management Plan.

I have questions about the fact that the duration of the pumped outflows don't match the increases or decreases in the observed volume or storage volume in both the Misery pit and the Jay dike dock area.

(BRIEF PAUSE)

MR. RICHARD BARGERY: Richard Bargery, Dominion. That's -- I think we've got the clarity in terms of the -- the question. And -- and we're going to have to go back to the water balance model and -- and come back with an answer on that.

(BRIEF PAUSE)

MS. SACHI DE SOUZA: Okay. Sachi De Souza, with the Board. Sticking with the overall site water balance, it would also be useful for the Board's understanding of the operations to understand if there is sufficient capacity within the LLCF to manage the predicted long -- or the expansion, and there's no indication from the information provided yet that there is that capacity with the water management structures at the main camp.

Is there data to prove that, or modelling to confirm that?

(BRIEF PAUSE)

MR. ERIC DENHOLM: It's Eric Denholm speaking. So in that -- regarding the LLCF, you -- we -- we know it's -- it's -- the -- the fine processed kimberlite in slurry is going to the Panda/Koala pits for the duration of the Jay project. So the capacity you're interested in -- you're asking about is -- is capacity for -- for the -- for water, or I'm -- just -- maybe you can clarify.

What -- what capac -- just which -- in -- in light of this -- they -- you -- you -- in light of the -- there's no fine processed kimberlite going to the LLCF through the Jay project, what's the capacity that you're interested in?

MS. SACHI DE SOUZA: Sachi De Souza, with the Board. For the processing facility, and maybe I don't understand this very well because I haven't seen the detailed water balance, you will process the ore. There will be a waste stream from the processing plant. One of it will -- one line of that waste stream is the fine processed kimberlite.

Is another waste stream -- is there a separate waste stream for waste water, or processed water that gets sent to the LLCF, or is there just one (1) process stream?

MR. ERIC DENHOLM: It's Eric Denholm speaking. So, yes, there's -- there's only the one (1) -- there's only the one (1) pro -- exit from the process plant. And we call it the slurry, so it's got the fine processed kimberlite solids and the processed plant water all mixed up together in that, so there's only one (1).

MS. SACHI DE SOUZA: Okay. Sachi De Souza, with the Board. The plan to -- to put the fine processed kimberlite slurry into the mined out pits is reliant on the success of the Bear Tooth -- what's currently being done with putting FPK into the Bear

Tooth pit.

So what will happen if -- first of all, when will there be confirmation that Bear Tooth is successfully completing this job, and it will successfully create a meromictic zone and it will be okay for closure, and is there a time frame for -- for that information?

And second of all, if it doesn't prove to work, what is the contingency plan for the fine processed kimberlite?

(BRIEF PAUSE)

MR. ERIC DENHOLM: Yeah, it's Eric Denholm speaking. So -- so Bear Tooth -- Bear Tooth pit is -- is kind of -- it's -- it's more than -- it's -- it's much more than a demonstration project, but it is something we -- we do refer to as -- as an example of -- of a successful project for putting fine process kimberlite into a mined out open pit.

I don't think we were relying on some kind of measurement of success in Bear Tooth pit. I think we would say Bear Tooth pit is working well. It's -- it's going -- what we -- and what I mean by that is it -- the fine processed kimberlite is going in. It clarifies. We're in the process of pumping some mine water out over to the LLCF, all according to the plan for the use of Bear Tooth pit in this manner.

So I think we'd suggest that Bear Tooth pit is, you know, a effective and successful demonstration project. Again with the qualifier, it was much more important to Ekati than as a demonstration project, but -- so we're not relying on it and not looking to some future demonstration of success in Bear Tooth to -- to validate the use of Panda-Koala.

MS. SACHI DE SOUZA: Sachi De Souza, with the Board. So...

(BRIEF PAUSE)

MR. KEVIN O'REILLY: Thanks. Kevin O'Reilly, for the Agency. I just wanted to follow up on this line of questioning. I don't think we've actually seen any water quality results from Bear Tooth. And I think you may have had one (1) season, maybe, of some sampling. I know there was some difficulties in getting down the ramp into the -- the pit to actually take water samples.

But we -- we -- I don't believe we've

actually ever seen any water quality results from Bear Tooth. You know, are you measuring what kind of depth profile and no results -- if -- if those sort of results were available, it would be really helpful. And maybe you could file them with the -- the Review Board. Thanks.

(BRIEF PAUSE)

MS. CLAUDINE LEE: Hi. Claudine Lee, Dominion Diamond. Kevin, Bear Tooth pit is an SNP sample in the new water licence. So the requirement is to sample under ice and open water. And that's reported in the SNP. It was sampled in June, I think. Don't quote me on that, but it was sampled this year open -- open water, so that'll be in the -- in the SNP report.

(BRIEF PAUSE)

MS. SACHI DE SOUZA: Sachi De Souza, with the Board. I'm going to leave questions about the LLCF for now and move back just to the site water balance model. So in the site water balance model you use the EA case for groundwater inflows, which is a conservative estimate for groundwater inflows, and you used an average rainfall.

Earlier in the day during the hydrogeology presentation you mentioned that if you changed the zone for the -- the groundwater model, it could potentially reduce the groundwater inflows by about 25 percent. Reducing the groundwater inflows by 25 percent would -- would bring you closer in your water balance, from my calculations, to something closer to a fifty (50)/fifty (50) breakdown between surface water runoff contributions and groundwater contributions.

My concern with the conservative approach for the groundwater modelling and for using average climate in the water balance model is that there's the potential that everything has been overestimated in terms of quantity. So if you've over estimated the groundwater flows, if you've overestimated the surface water runoff, what could potentially happen, and I don't have the water balance, I haven't -- I haven't seen the numbers on it, is you might be overestimating the total wat -- water that needs to be treated.

In the long term what that could mean is, A) you have a different TDS concentration predictions. And the presentation has shown that you'd still get meromixis with the range of TDS volume -- concentrations, so I appreciate that.

But what would happen if you have overestimated this and is there pot -- the potential -- that you would potentially need, sorry, a -- a larger freshwater cap. So you would need to pump more water from Lac du Sauvage into the Misery pit, into the closed off Jay pit, because you've overestimated the amount of water you need.

And that relates back to the earlier question of the backflooding timing and protection of the threshold to come for protection of the Lac du Sauvage narrows.

(BRIEF PAUSE)

MR. RICHARD BARGERY: Sorry -- Richard Bargery, Dominion Diamond. Sorry, Sachi, but there's a number of questions in there in the -- in -- in what you just said. And we'd like to break them down on an individual basis and -- and try to answer them that way.

Can you just go through, starting with -- with question 1, and -- and we'll sort of answer in -

- in sequence here?

MS. SACHI DE SOUZA: Sachi De Souza, with the Board. I think the -- the one (1) question that maybe -- the big question is: Is there the potential that the modelling has overestimated the amount of water to come in that needs to be managed? And would that potentially change, as a result, the amount of water during closure that is needed to form the fresh water caps for Misery and Jay pits?

(BRIEF PAUSE)

MS. FIONA ESFORD: Fiona Esford, Golder Associates. I'm going to answer the first part of your question and Mike will answer the second part. So in terms of have we potentially overestimated the total volume combination of groundwater and surface water to be managed as part of the overall water management pro -- program. That is possible and that would just ultimately delay when we initially begin discharge into Lac du Sauvage.

But the -- the Misery pit will still fill. It's just maybe instead of being similar to what we saw in the conservative -- the DAR assessment case versus the reasonable estimate case, there was a one

(1) year delay. Maybe there's a year and a half delay. It's still going to occur.

MR. MICHAEL HERRELL: It's Mike Herrell, from -- for -- for Golder Associates. So as Fiona indicated the pit will fill and we've run two (2) sensitivities. One (1) the conservative EA case and also the -- the reasonable estimate case. And throughout the -- the life-of-mine the pit will fill and discharge. And that won't change the closer -- the Closure Management Plan which is to pump the upper 50 metres because there's 10 metres of free board in there over to the Jay pipe and leaving capacity for -- for 60 metres of storage in Misery pit. So the volume of water that will be pumped from Lac du Sauvage into Misery at closure will be the same volume of water that's required.

MS. SACHI DE SOUZA: Okay. We'll leave it there. It's Sachi De Souza, with the Board. In the interest of time, I think we should be -- start -- we should start discussing water quality predictions into the downstream environment and closure predictions through meromixis and the pits.

Sachi De Souza, with the Board. And also the -- the topic of -- of contingency storage and treatment. There was a number of IRs related to that.

MS. MEAGAN TOBIN: All right. Meagan Tobin, with Environment Canada. If that's -- take the heat off these guys a bit. So my first question is regarding the phosphorous guideline that was used, which was the mesotrophic to miso-eutrophic guideline, according to CCME.

So although we acknowledge that the natural variability within Lac du Sauvage causes difficulty in setting this guideline or the trigger value, Lac du Sauvage is still classified by several measurement methods as an oligotrophic lake and should remain as such.

And so we understand that, given the EA estimate cases, the phosphorous concentrations are likely overestimated. So the guideline of 20 micrograms per litre is just far too high for our comfortable -- comfort.

So based on the CCME guidance of the trigger ranges, which is oligotrophic, as well as the CCME guidance of the 50 percent baseline rule where if in exceedance of 50 percent of the baseline, then it warrants further investigation, both leaves the guideline concentration at the 10 microgram per litre area.

So I don't know if you wanted to comment on that. I don't have a direct question other than we see the 20 microgram per litre as just far too high.

(BRIEF PAUSE)

MR. JOHN FAITHFUL: It's John Faithful, from Golder Associates. We've -- we've given a lot of thought to -- to the way that we've evaluated the -- the potential trophic shift. We don't -- we don't disagree with the fact that, for -- for all intents and purposes, Lac du Sauvage does exhibit all the characteristics of oligotrophic lake. It has a low productivity.

We do also acknowledge that there is quite a -- a wide temporal and spatial total phosphorous concentration that -- that has been measured in the lake over the -- over the period of time that we've tried -- looked at -- looked at existing data to -- to characterize the reference condition.

And it's primarily that part -- that -- that point that, although the -- the mean concentration is -- is somewhere -- it's around 6 to 7 micrograms per litre, that -- that you do get that occasional shift to -- to 18 micrograms per litre I think was the -- was the maximum concentration.

Nevertheless, when we -- when we look at the model predictions and we -- we establish what we consider are the maximum predicted concentrations of, I think, 12 micrograms per litre as a -- particularly under ice con -- conditions, it's still within that -- that overall range of concentrations.

And on evaluation from a lower trophic and plankton point of view, that low productivity still -- still remains. And our position is that setting that -- that screening value or that benchmark of -- as the upper bound of -- of mesotrophic is -- is still appropriate.

(BRIEF PAUSE)

THE FACILITATOR: Do you have a -- a follow-up question to that? Okay. Thank you.

(BRIEF PAUSE)

MS. MEAGAN TOBIN: Meagan Tobin, with Environment Canada. I guess our concern with setting the value so high is that a shift to that level and having just the basic guideline at 20 micrograms per litre would cause a significant shift before any impacts would even need to be assessed, or evaluated.

So, I mean, we -- the difficulty with Lac du Sauvage is that it does have -- I think about 5 percent of the time does jump into that mesotrophic range. However, it is not near the meso-eutrophic. So twenty (20) is too high. We understand the difficulties with ten (10).

If we could -- the -- just -- the guideline as it stands is just -- it allows for too much of a almost pollute up to.

DR. KATHY RACHER: Kathy Racher, for the Board. If I may, I think what Environment Canada is talking about is -- is using the 10 micrograms per litre as a -- as a water quality objective as opposed to using 20 micrograms as a water quality objective. In your -- in the DAR, you used twenty (20) as a screening value to sort of see, you know, is this -- is this an area of a -- of a big effect, and -- and your conclusion was that it was not, because there is a -- a -- it's close to the nature range of vari -- variability.

But I -- I guess the question really is, Would you agree that going forward, that the -- the appropriate water quality objective for phosphorus would be ten (10), not twenty (20)?

MS. MEAGAN TOBIN: And -- Meagan Tobin, Environment Canada -- to elaborate on that slightly, Environment Canada would be comfortable with the median -- the median staying under that 10 micrograms per litre.

(BRIEF PAUSE)

MR. JOHN FAITHFUL: It's John Faithful, for Golder Associates. I think we -- we've got to keep sight also that we're -- we're still in the -- the DAR evaluation process where we've set the -- the -- I guess the screening level for total 'P' is the upper bound of -- of mesotrophic really takes into account what we've seen with regard to the -- the natural variability within the Lac du -- du Sauvage system.

We still have evaluated the -- the duration by which we do see increases in -- in phosphorus within Lac du Sauvage. We've been able to apply what that change potentially can mean with expect to lower trophic organisms and plankton, and as such, for this -- for the EA process, or this DAR process, we're still comfortable with the fact that we've set our -- our sort of initial screening value as twenty

(20), because it does cover off the natural variability of the -- of the total phosphorus concentration that we're predicting for that five (5) year to six (6) year discharge period into Lac du Sauvage.

DR. NEIL HUTCHINSON: Neil Hutchinson, for the Board. I -- I would just like to challenge and disagree with your conclusion, that a natural variability in which only 5 percent of the measurements that you've made exceed 10 micrograms per litre classifies a lake as mesotrophic. Classifications are done on central tendency on medians and means, and not by the more extreme values that you prefer.

I -- I think what -- what we're a bit concerned here is that setting the screening level says it's okay to get up to twenty (20), because as long as you're within twenty (20), you haven't violated any of the EA predictions, should the predictions prove wrong. And we've seen experience already with Snap Lake where EA predictions turned out not to be met, and we had to reopen the EA process to define it, if the screening level was appropriate or not.

And the Board is concerned that if we set twenty (20) as the screening level here, that's going to allow a radical change in a lake that's currently at 6 or 7 micrograms. And I'd point out that your predictions of 12 micrograms are maximum values. They're not median values, and they only occur in the under-ice season. So we don't see much risk, actually, in calling the lake for what it is.

MR. BARRY ZAJDLIK: Barry Zajdlik, on behalf of GNWT. If I could add to Neil's comment?

THE FACILITATOR: Could you hold your comment for just a moment, and then we'll... Okay. Go ahead with your comment, and then Dominion Diamond can respond.

MR. BARRY ZAJDLIK: Barry Zajdlik, on behalf of GNWT. Measures of central tendency are only one (1) thing to consider when we're looking at things that either biomagnify our nutrients. Another consideration is loadings. A small incremental change in the measure of general tendency will lead to massive changes in loadings over the course of five (5) years, and I think we also have to consider loadings as part of the -- the screening criterion here.

(BRIEF PAUSE)

MR. JOHN FAITHFUL: John Faithful, Golder Associates. I think one (1) -- one (1) area that we want to sort of confirm is that even though that we've set a -- a screening value and I've -- I've provided a -- a rationale for -- for why we've -- we've set 20 micrograms per litre as our initial screening value, but we haven't indicated that -- that we think that Lac du Sauvage is a mesotrophic lake, nor will it be mesotrophic at the -- as a result of the -- of the project.

We do see -- take -- take Neil's point that with respect to -- to our predictions over that short discharge period, that under-ice conditions do show peak concentrations of 12 -- 12 micrograms per litre. But again, it's -- it's really how we've set the process in terms of screening.

The expectations are that the -- the concentration will remain will -- are not expected to -- to exceed 12 micrograms per litre. Also, taking into account the factors that I made in the presentations earlier about the over-conservatism of 'P'. It's -- it's really on the basis of how we've addressed the screening process for the predictions for phosphorus in the receiving environment.

THE FACILITATOR: We still have a number of topic headings on the agenda to get through, but I will just continue to ask for questions related to -- we've got capacity contingency and safety factors, but -- and then next after that, discharge timing and quality. But I see there is a question. Please, your name.

MR. RICK WALBOURNE: Rick Walbourne, GNWT. I have a question on the contingency aspect. I believe it was on slide 5 of the -- Dominion's presentation, if you want -- if you want to pull that up. And it was in response to GNWT IR58.

Several contingency options were outlined, King Pond, Misery pit, Lynx pit. I'm trying to condense this into one (1) question. I have five (5) or six (6), but I guess basically, could Dominion provide a total capacity of those contingency areas, should it be required? And the list, again, is on slide 5, I think.

(BRIEF PAUSE)

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. So King Pond is 1 million cubic metres, Misery 3 million, and Lynx is five point two (5.2). So those are the -- the largest, the majority, which is what nine point two (9.2)?

MR. JOHN FAITHFUL: Yeah.

MR. RICK WALBOURNE: Rick Walbourne,

GNWT. I have a follow-up on that. But you did also mention, I think, in your response that there was potentially the use of a storage capacity site available at the Ekati site.

Was that also an option, and what specifically were you referring to there? I -- Koala or Panda, or -- or what was that referring to?

(BRIEF PAUSE)

MS. FIONA ESFORD: Fiona Esford, Golder Associates. Yes, we were referring to the other pits within -- at the main Ekati site as providing further capacity.

MR. RICK WALBOURNE: Thanks for that response. Rick -- Rick Walbourne, GNWT. I guess what I'm trying to get at, I'm trying to get an understanding of total capacity in the event that water quality predictions in the Misery pit were higher than anticipated. I'm trying to then convert that capacity into what kind of timelines do you anticipate that you would be able to store water, if required. Months? A year? I guess, whatever your total capacity is divided by your daily inflow into Jay, or whatever -- whatever the factor might be. I'm trying to get an understanding of total time that you can store water. Thanks.

(BRIEF PAUSE)

MS. FIONA ESFORD: Fiona Esford, Golder Associates. The first point is that we've been very conservative in our estimates of the volume and water quality as discussed previously today. The capacity and what we would do for contingency measures depends on the situation that would arise and -- and what volume or -- or condition was required.

Fox, for instance, has 80 million cubic metres of capacity. The 3 million additional capacity or the freeboard capacity within Misery gives us six (6) months additional storage capacity for the DAR assessment case.

MR. RICK WALBOURNE: Rick Walbourne, GNWT. Thanks for that answer. I had got a couple more questions on -- on some of those areas, specifically Lynx pit. I'm assuming that would be filled after dewatering of the Jay area. You mentioned 5.2 million capacity which I think is the total capacity of Lynx pit which would mean it would have to be dewatered.

At what point after filling of Lynx

would it be possible that that could be dewatered? I know there's going to be high TSS in there originally. What timeline do you anticipate that water could be dewatered from Lynx to make it available for Misery?

(BRIEF PAUSE)

MS. FIONA ESFORD: Fiona Esford, Golder Associates. As part of the back-flooding of Lynx, we're not filling it with the dewatered high 'T' -- total suspended solid water right to the crest. There's a portion that's left for natural seepage and -- and runoff to come into Lynx pit, and that's estimated to be two and a half (2 1/2) to three (3) years before Lynx pit would naturally discharge to the environment.

Obviously monitoring would occur during that before discharge would occur but the total suspended solids from the dewatering is estimated to settle well before that two and a half (2 1/2) year period, and -- and well before Misery pit would come anywhere close to capacity.

MR. RICK WALBOURNE: Rick Walbourne, GNWT. Thanks for that response. I've another question in that regard. Regarding the use of Lynx pit or existing mine sites on the Ekati site, does the project anticipate any implications on closure options for those pit lakes that there are proposed to be in the future? And, as such, do they anticipate any implications to existing water licences for the Ekati site that may require amendments as a result of contingency plans related to the Jay project?

(BRIEF PAUSE)

MR. ERIC DENHOLM: It's Eric Denholm speaking. So I -- so if we were to use as -- as adaptive management, future adaptive management sort of response, the pits, you know, in this manner, regardless of -- of the actual use of the pits in those matters, I think I'd say the -- any water that ultimate would -- for closure, that would be released from those pits is going -- it will -- would have to -- it already and would remain having to meet criteria defined in the water licence. That wouldn't change. That's already the case for the open pits. I wouldn't see that that would change if we had incorporated the pits into a -- an adaptive management response in some way.

DR. KATHY RACHER: Kathy Racher, for the Board. Rick, we were just wondering how many more questions you have in -- in this vein? We have a lot to -- a lot to do by the end of the day, so.

MR. RICK WALBOURNE: Rick Walbourne, GNWT. That was the last question, but I -- I don't think that was the response I was -- I was looking for. I wasn't -- yeah. I had asked earlier about water coming from Lynx and TSS. Now I was kind of -- the question was regarding closure options for those lakes if they were to be filled with -- say Lynx, for example -- with water from dewatering of Jay, which could be high TSS which would settle out.

If now we're potentially filling that with high total dissolved solids water from Misery pit, it changes the -- I guess the closure of those pits. Similarly, the -- the pits on the Ekati site, if they were pit lakes just going to be refilled from Lac de Gras or Lac du Sauvage and either being filled with highly salty water from Misery and -- which came from Jay, my question was:

Does that then change closure options for those lakes that may have been said to become pit lakes, for instance? Would the water quality then be altered and we would have to revisit closure options for those other pits?

My other question was regarding

regulatory implications from the existing Ekati licence that may result from the use of those pits as -- as water management ponds related to the Jay pit.

So there were two (2) questions there that I don't think were answered. And that -- those are my last questions, if they're responded to.

(BRIEF PAUSE)

MR. ERIC DENHOLM: Okay. Yeah, it's Eric Denholm speaking. Thanks for the clarification, Rick. So again, just -- just to reset, if -- if I could, the context a little bit. We're talking -- you know, we've done -- as we say, conser -- what we think are conservative estimates of -- of the -- the water quality and quantity that would be going into Misery pit, and the Mine Water Plan accommodates that. And so we're -- we're discussing conceptual possible future adaptive management responses that we -- we don't expect to actually be doing.

However, take -- your point taken. The nature of adaptive management responses, if we don't know right now what that might look like, they're designed at the time to deal with the situation that's -- that's at hand. So, conceptually, if the -- some of these other pits were used as part of an adaptive management response in this manner, conceptually that -- that could have implications for the closure measures.

And if that were to be the case, as is -- as is already the established framework, that would -- the adaptive response plan and including any implications that it might have for closure of those pit lakes, would go to the Wek'eezhii Land and Water Board for its approval.

MR. RICK WALBOURNE: Rick Walbourne, GNWT. Yeah, thanks for that response. I think we'll leave it there for now.

THE FACILITATOR: Okay. Thank you. It's Bill Klassen. Neil Hutchinson has indicated that he has a question. We -- we still have a number of topics to cover, and we've got, by my watch here, an hour and ten (10) minutes to go, so we'll just continue right through.

DR. NEIL HUTCHINSON: Thank you. Neil Hutchinson, for the Board. Sorry, this is kind of a follow-up on the trophic status discussion we had before. But reading your predictions, I was rather concerned that although you're predicting fairly modest increases in phosphorus concentrations, your model is predicting pretty radical increases in chlorophyll in -- in the algal community that follows. And you predicted chlorophyll up as high as 15 micrograms per litre, which puts you quite squarely into eutrophic range.

And so I went digging, and I -- I -- on your hydrodynamic modelling section in -- in Appendix 8F, you talked about three (3) adjustments you'd made to your model to increase the algal production, such as changing the mineralization rate for -- for organic phosphorus, and changing carbon chlorophyll ratios. But I'm just concerned that you've over-predicted your chlorophyll, and we don't quite have and we don't quite have an accurate assessment of how the lake is going to end up.

I would expect if you're increasing phosphorus from six (6) up to about nine (9), your chlorophyll might go up from -- it's an average of two (2), two and a half (2 1/2) right now, it should only go up to four (4) or five (5). So there's a -- I was just wondering if you could provide some insight into how you've made those predictions?

(BRIEF PAUSE)

MR. JOHN FAITHFUL: It's John Faithful, Golder Associates. The -- I think the -- the model actually predicts phytoplankton. It's whatever it -- whatever the -- it's a GEMSS model, correct? It's a GEMSS model that has a biological module in it that -- that accounts for -- for a number of different growth parameters based on -- on background concentrations, phosphorus being one (1) of them.

We -- we do concede that there -- there is a high level of conservatism around the predictions for chlorophyll. We focus a lot on the -- on the phosphorus piece. And -- and I've spoken a lot about the -- the potential for overpredicting phosphorus in -- in Lac du Sauvage as a -- as a function in the modelling.

Given that we -- we understand that the -- that the -- the drive behind the phosphorusing in -- in the -- in the discharge water is -- is the groundwater that's -- that's coming from Misery. We have -- we have, as indicated by Fiona, with -- within the Water Management Plan, the luxury of having a fair amount of time in order to -- to track predications in -- in the Misery pit.

We're going to know well in advance when we do the pit development as to -- to what the phosphorus numbers are that we're dealing with. And -- and those predictions, whether or not they need to be man -- the phosphorus whether it needs to be managed within -- within Misery pit prior to discharge gives us a really good insight as to -- to where we're heading with respect to -- to phosphorus concentrations in -- in Lac du Sauvage.

And that in itself will allow us to -- to continue to evaluate what the potential for changes to chlorophyll concentrations are. But again, based on the -- the phosphorus concentrations that we did in -- indeed predict for the -- for the DAR under this conservative case, we -- we've provided our assessment findings with respect to ogliotrophic and plankton concentrations.

DR. NEIL HUTCHINSON: Thank you. Neil Hutchinson, for the Board. I -- I think what you just said, John, is -- reinforces the need to have a good screening value for total phosphorus as Environment Canada raised, so that as you adaptively manage as you go, we know what we're managing towards.

But to come back to my original question, so you think that what it says, chlorophyll is not chlorophyll A as it's usually seen. It's actually an expression of phytoplanton biomass and then

-- so it's not straight chlorophyll A as measured in the water, which I think is your first answer?

MR. JOHN FAITHFUL: John Faithful, Golder Associates. Yeah, Neil, we're going to -- we're going to provide a confirmation on -- on that -- that -- on that direct relationship.

(BRIEF PAUSE)

THE FACILITATOR: In the next -- it's Bill Klassen. You'll provide that clarification within the next hour. Did I understand that correctly?

MR. JOHN FAITHFUL: John Faithful, for Golder Associates. Bill, yes, we're going to do that within the hour.

THE FACILITATOR: Okay. Mr. Paquin...?

MR. EMERY PAQUIN: Emery Paquin, with the Monitoring Agency. My questions are in regards to the IEMA IR number 4. And in that -- in that IR we requested the -- the Company to indicate whether contaminants of potential concerns and nutrients are predicated to return to pre-development background levels in Lac de Gras.

In your -- in your resp -- in the Company's response it's -- it was kind of 'yes' and 'no'. The -- the models in the DAR predicts that -- predict that some constituents are going to return to pre-development con -- concentrations, while others will remain elevated at the -- at the end -- or sorry, during the -- the post-closure period.

My first question is: Are these predictions made for the end of the post-closure period in 2060? Or are you expecting these conditions to manifest -- manifest themselves earlier?

MR. JOHN FAITHFUL: John Faithful, for Golder Associates. Can we show -- throw up one (1) of the slides from our presentation please?

MR. MICHAEL HERRELL: What's his name?

MR. JOHN FAITHFUL: John Faithful, for Golder Associates continuing. The -- the one (1) with the -- the multiple plots on it.

(BRIEF PAUSE)

MR. JOHN FAITHFUL: John Faithful, for Golder Associates. So if we -- if we look at the -- if we look at both -- both plots for Lac du Sauvage, the updated assessment case. And I think this is -- this is for total dissolved solids. For Lac du Sauvage, as you see, the -- the relationship there around the --

the reference condition prior to the effects to Lac du Sauvage as a result of project discharge, you get that progressive increase in -- in -- La -- in TDS concentrations in Lac du Sauvage.

The different colours reflect the different assessment nodes. So the -- the gradient effect with respect to TDS in Lac du Sauvage. Following the cessation of pumping you get a -- a gradual return back to -- to what we're saying is sort -- sort of closure conditions. The -- the concentration of TDS is slightly higher than what it is in -- in the reference conditions. It's very close, but it's slightly higher.

And so in -- in that regard we say that there is a -- there is an ongoing effect to the change in -- in water quality. However, it's very close to -- to background conditions. Part of that, what's driving that TDS is that ongoing discharge from -- from the site area. And again, coming back to the fact that we've taken into account a number of conservative elements, we would sort of probably -- we would sort of come back to the conclusion that background concentrations are re-established.

If you go to Lac de Gras we have a very similar condition, although the pattern in terms of the changes are -- are based around current operations, cumulative effects, effectively. We get a return of TDS concentrations within this modelling domain to an area that's -- that's again close to -- to the original concentrations. But it's -- it's not exactly where it is at the -- at the reference condition. It might eventually get -- get to that point, but within the modelling domain we see a return back to concentrations that are slim -- similar to the re -- reference or the base case concentration.

MR. EMERY PAQUIN: Emery Paquin, monitoring agency. And I looked at those -- at those charts and I accept your conclusions with respect to -- to TDS. However, in your response to IR -- to our IR, you also make reference to ten (10) constituent concentrations which you identify as -- as being -- as predicted to be higher than the existing conditions, but well below benchmarks. So in your response, you do indicate that there are going to be some constituents that continue to be higher than even existing conditions.

But -- so my question is -- is: Are your predictions for the end of the closure period or at some point during the closure period?

(BRIEF PAUSE)

MR. MICHAEL HERRELL: It's Mike Herrell, from Golder Associates. So the -- the model predicts water quality continuously, and it generates these time series. What -- we present results in two (2) ways, one (1) in the time series that presents the -- the results, and they're calculated at different time steps but results are pulled out of the model bi-weekly. And in the tables we present maximum values.

So when John's referring to approaching the baseline conditions, he's talking about at the end of the predicted period.

I do want to comment on that list of parameters, and back to your original question, which was some parameters, yes, will go down and others won't. That's -- the -- the ones that won't, generally the metals, they're related to inputs in -- that are built into the model, conservative inputs.

So in the -- the lake hydrodynamic model, a dye is applied for every input into the lake at a given concentration. And the percentage of that dye at any particular point in time is used to calculate a concentration.

And the inputs that are used to

calculate that concentration from each source, a maximum concentration would be used. So, for example, for Slipper Lake, the inflow to Lac de Gras, a maximum concentration during the -- the whole operational period for a metal may be applied at post-closure when it would be much lower than it is.

So some of the parameters that are -- are -- that are predicted not to return to baseline conditions are based on really conservative assumptions. In reality, it's more likely that they would re -- return to baseline conditions.

MR. EMERY PAQUIN: Emery Paquin, with the Monitoring Agency. Yes, it's -- it is recognized that all of your predictions are based upon a conservative approach, which you have reiterated throughout these hearings.

My second -- my second question is with respect to the -- your response to the same IR. And that is where you say that, if the -- if the Misery pit water quality monitoring data begins to trend beyond -- beyond the DAR predictions, and then Dominion Diamonds has sufficient time to proactively address adaptive management.

Now, in your -- in -- in the same presentation that you gave late this morning, you provided examples of some adaptive management strategies.

My question is: How are you going to -- to get between the time where you recognize that the water quality data is trending beyond the DAR -- the DAR predictions and actually implementing or deciding which of the adaptive management strategies that you're going to implement?

Have you considered which -- have you considered criteria that would trigger specific adaptive management strategies?

(BRIEF PAUSE)

MR. EMERY PAQUIN: Just -- just -- and it's Emery Paquin again. Just a supplementary comment. It goes almost without saying that sufficient lead time in order to begin to consider adaptive management strategies would be critical.

(BRIEF PAUSE)

MR. ERIC DENHOLM: It's Eric Denholm speaking. Yeah. Under the -- under the Ekati water licence, we're in -- we're just now finalizing -- or put it this way. With the Wek'eezhii Land and Water Board for review is an aquatic response framework that ties to the aquatifi -- Aquatic Effects Monitoring Program to provide just what you're asking about: thresholds, early warnings levels, and so on.

So what we anticipate is that the Jay project, relevant aspects of the Jay project, would be incorporated into that response framework under the water licence, which is for the purpose that you're -- I think you're getting at. Thanks.

MR. EMERY PAQUIN: Emery Paquin, with the Monitoring Agency. Yes. And -- and I understand that the aquatic response framework is currently draft. When do you anticipate finalizing that framework?

MR. ERIC DENHOLM: Yeah. It's Eric Denholm here. At the moment, that's subject an undergoing review from the Water Board, and the timelines are -- are set by the -- the Water Board, and we're -- it's a process underway. We'll work with the Water Board timelines and -- to complete that. Thanks.

(BRIEF PAUSE)

MR. KEVIN O'REILLY: Thanks. Kevin O'Reilly, with the Monitoring Agency. Yeah, the -- the Agency has been involved in, I guess, the two (2) drafts of the aquatic response framework that have been submitted so far, and there's a -- a lengthy list of additional information that the Company is going to provide, and I guess there may be a workshop as early as May to start to talk about that, and perhaps finalize it.

I guess the issue though for us here during this environmental assessment is: Is there any sort of direction or advice that we -- we want to pass along to the Review Board and to the Company in terms of when that aquatic response framework is finalized and it's updated for Jay, what sort of things should be considered there?

I guess I'm just throwing that out as a question, particularly in light of -- or with regard to contingencies for water management, because that's obviously a big issue here. And we're -- we're going to be thinking about that, and -- but I don't know if you have any response or -- at this point.

(BRIEF PAUSE)

MR. RICHARD BARGERY: Yeah, Richard Bargery, Dom -- Dominion Diamond. I -- I'm not sure the -- exactly there -- there was a question there. I think it was more like a comment from Kevin.

I'd just make the point that, you know, we do have a five (5) year period here as well, to -- you know, during the life of the project to -- to consider just those kinds of -- those kinds of issues.

THE FACILITATOR: Okay, thank you. It's Bill Klassen. Todd, you have a question?

MR. TODD SLACK: Thanks. It's Todd, from the Yellowknives. I'm guessing the -- I have a similar question to the one that was asked earlier by Dr. Hutchinson, and it -- it's: At what point would you begin to see significant impacts from TDS? We're looking again at the significance thresh -- establishing a significance threshold, here.

(BRIEF PAUSE)

MR. JOHN FAITHFUL: It's John Faithful, Golder Associates. A significance threshold would be a -- a persistent chronic toxicity effect in the receiving environment as a result of TDS concentrations.

MR. TODD SLACK: Todd Slack, with the Yellowknives. Well, that naturally -- I'm sure you can anticipate the question -- begs the question: At what point would that happen?

(BRIEF PAUSE)

MR. JOHN FAITHFUL: It's John Faithful, Golder Associates. Todd, I don't have an answer for that as an abs -- absolute value at this point in time. We do have -- have guidelines specifically that we can refer to. But just coming back to -- to where we ended up with with respect to -- to the DAR conclusions, we've been able to evaluate a -- a conservative case in terms of -- of Misery pit discharge to the Lac du Sauvage, and -- and we're not predicting chronic effects to occur, that's out of the -- the conceptual diffuser design that we've applied to -- to the modelling within Lac du Sauvage.

MR. TODD SLACK: Thanks. It's Todd, with the Yellowknives. And, yeah, I certainly hope you're correct, but we've had instances where predictions, particularly around TDS, haven't always been so correct. So, you know, that's the nature of this question.

Now, you guys have proposed a TDS SSWQO of a thousand (1,000). I'm wondering if you can give us some information where that number comes from?

(BRIEF PAUSE)

MR. JOHN FAITHFUL: It's John Faithful, from Golder Associates. Todd, I -- I apologize. I -- I missed the question. Could you repeat it, please?

MR. TODD SLACK: Sure. In Attachment AF-1, the Company proposes a TDS SSWQO of a thousand (1,000). And I'm just wondering, where does this number come from?

(BRIEF PAUSE)

MR. JOHN FAITHFUL: John Faithful, Golder Associates. Todd, we're going to have a look at that document and -- and determine whether -- whether -- the wording that's -- that -- in it to determine whether or not we actually specify site-specific water quality objective. The -- the site that -- we do use site-specific water quality objectives as part of our screening criteria, those that have been established specifically for -- for the Ekati operation.

We do include some of the parameters that constit -- that -- that constitute TDS, that being nitrate, sulfate, and chloride. But we'll -- we'll take a look at that particular reference. If you could confirm what that reference was?

MR. TODD SLACK: It's Todd Slack, with the Yellowknives. I have Attachment AF-1. And, yeah, if you guys want to take it away and come back. If we can -- just have an opportunity to speak to this when they do, that'd be great.

MR. CHUCK HUBERT: Chuck Hubert, with the Board. Todd, just one (1) minute, Attachment AF-1 to which document?

MR. JOHN FAITHFUL: Appendix 8-F.

THE FACILITATOR: Thank you. It's Bill Klassen. Environment Canada has a question, then I believe there's a question over here somewhere.

MS. MEAGAN TOBIN: Hi. It's Meagan Tobin, with Environment Canada. Just a bit of a follow-up to Todd with the TDS and toxicity. So this is in relation to Environment Canada's IR-20. And so we would like to clarify one (1) of the statements.

So in Dominion's response, they had stated that chronic toxicity is only applicable to the mixture of pit water and water at the edge of the mixing zone. And this was in response to when we had asked if they would be willing to complete the lethal toxicity of the Misery pit effluent.

So we'd like to clarify that chronic toxicity is done on effluent at end-of-pipe for the purpose of evaluating the effects. And it is not routinely done in the receiving environment, with the exception being Snap Lake, but they do this in addition to their end-of-pipe, sublethal testing. So we would like to reiterate our initial IR of just whether Dominion is willing to conduct sublethal tests on Ceriodaphnia for simulated effluent.

(BRIEF PAUSE)

MR. ERIC DENHOLM: Yeah, it's Eric Denholm speaking. Yeah, so -- yeah, we acknowledge in the -- the Ekati water licence itself calls for sublethal testing not as a com -- compliance test, but for -- as just part of the SNP collection of information, and so acknowledge that on an operational basis. I think I'd just -- just like to -- to highlight a couple of things. And one (1) is our -- our commitment for the -- you know, the effluent from -- from Misery pit is not acutely -- non-acutely toxic. That is the -- the standard that we've -- we've said.

And so given that, I think the intent --

the broader intent of our response was to say that for -- for the assessment, for -- for right now, for the purpose of assessing potential effects of Jay project, we don't see the sublethal testing as playing a role. We've -- because that's not a test that we would think the effluent is going to put -- put to on a -- on a compliance basis. Thanks.

MS. MEAGAN TOBIN: Meagan Tobin, Environment Canada. So I guess just for -- for our point, given some of the issues that have happened at other mines, the use of the more sensitive test organisms with the mortality end point can tell us more about the potential environmental effects.

For example, the high -- or TDS waters could affect the sensitive daphnids and the clams more than the standard acute tests like the rainbow trout and the daphnia, which are not as sensitive to salinity. So that's just our reason for asking for this test.

MR. ERIC DENHOLM: Okay. Eric Denholm speaking. Okay. Thanks for the comment.

(BRIEF PAUSE)

THE FACILITATOR: It's Bill Klassen. I

understand that there's another question here at...

(BRIEF PAUSE)

THE FACILITATOR: We have a mystery guest here that...

MR. GORD MACDONALD: Gord MacDonald, with Diavik. No mystery. Thanks for all the information you guys have provided on -- on Lac de Gras and on the additional -- the additional scenarios that were run. The information does help us. Our -- our question to Dominion, I'll start with, is -- is: Will -- will DDC assess -- so it's -- it's great that all the information is there, but I think we're waiting on -- on assessment of impacts, and in particular for us, whether -- whether DDC is going to look at the assessment of impacts on downstream users, in particular, industrial and municipal users.

And included within that would be the impact on industrial and municipal users. And included within that would be the impact on industrial waste assimilation, and is that something DDC's going to do?

MR. JOHN FAITHFUL: John Faithful, Golder Associates. Thanks, Gord. We believe that the assessment end point that we've -- we've applied and assessed is -- in the DAR takes into account in -- all potential uses, and -- and that includes the industrial uses.

The level of protection that we apply around that assessment end point, it's -- it's linked to aquatic life, wildlife, and human use. And -- and that -- that's potentially much greater, in our view, than -- than what would be required for industrial uses.

So we -- we think that we've -- we've accommodated that -- that particular element that you've requested in our assessment endpoint.

MR. GORD MACDONALD: Gord MacDonald, with Diavik. So -- so less on the -- on the inability to use water for withdrawal, but more on an ability to discharge water, because the chemistry of the receiving environment has changed?

(BRIEF PAUSE)

MR. JOHN FAITHFUL: John Faithful, Golder Associates. One (1) of the -- one (1) of the elements that we've -- that -- that Dominion have taken into -- into the mine plan is -- is consideration of time frame around of -- of operations.

And with respect to the Water Management Plan and -- and the -- and the planned discharge to -- to Lac du Sauvage, I think, to the extent possible, the -- the plan has to -- to minimize any potential overlap with respect to -- to operations.

You know, but in saying that, to reiterate our point in terms of the -- the conservatism around the -- the applications of our assessment end points and the protectionism that we're -- we're gearing towards, we believe that we've -- we've accommodated that -- that industrial use element.

MR. GORD MACDONALD: Gord MacDonald, with Diavik. So I -- I guess we'll just disagree on that, and I'll the question to the Board and ask in -- you put out an IR with respect to assessment end points. I don't know who I'm actually speaking to when I speak to the Board. And you asked whether we thought the assessment end points were appropriate or not, and we did comment that we didn't think an assessment end point on industrial use had been included in the -- in the DAR.

What does the -- what is the Board doing with -- with our response to your IR?

MR. MARK CLIFFE-PHILLIPS: Mark Cliffe-Phillips, with the Review Board. So right now at -- at the conclusion of the technical sessions, the -- the Board will be briefed on the outcomes of the IR responses as well as the discussions here at the technical session. And we'll bring that in front of the Board, and the Board will take that into consideration.

MR. GORD MACDONALD: Thanks, Mark. It's easier than saying, "Board." So we'll just say that we don't -- we don't think that that assessment end point has been addressed, and we think it should be. But obviously, it's up to the Board to make the decision. Thank you.

THE FACILITATOR: Thank you. It's Bill Klassen. We've got roughly twenty (20) minutes left before we move to identifying what the summary of undertakings and commitments are. So are there other questions related to this water topic generally?

I see someone nodding that they're having a question.

MR. BARRY ZAJDLIK: Barry Zajdlik, on behalf of the GNWT. Are we okay with the -- the handout that I gave to -- or that DDC received?

THE FACILITATOR: It's Bill Klassen. I'm personally not familiar with that.

Is there someone here -- Mark will speak to it.

MR. MARK CLIFFE-PHILLIPS: Maybe I'll just speak to this a bit. Mark, with the Review Board. Barry Zajdlik, technical advisor to GNWT, had come to us with a -- a handout with a summary of some of the material that was provided in a -- a response to an IR to -- to GNWT.

It involves a table and a -- a summary figure, and we presented that to -- to some of the staff at Dominion. And what -- what -- we just want to hear a response if we could speak to that today?

MR. ERIC DENHOLM: Yeah, it's Eric Denholm speaking. Yes, I have it here but I didn't want to interrupt the -- you know, we need -- we haven't taken a look at it yet. I didn't want to interrupt the questions that were going on. So -- so we have not looked at that yet with the folks that can sort of validate it, so.

MR. NATHEN RICHEA: Thank you. It's Nathan Richea, with the Water Resources.

We have additional copies here for Board and -- and people who are interested, if they're...

DR. KATHY RACHER: Could you guys just -- just let us know what this -- in general what the question is about and what the handout is about, so we can get some context because most of us haven't seen it? The summary of -- yeah, a summary of what you're looking for.

MR. BARRY ZAJDLIK: Barry Zajdlik, on behalf of the GNWT. The question has to do with the likelihood of the pit lakes being permanently stratified. How stable is the meromixis?

DR. KATHY RACHER: Okay. Kathy Racher, for the Board. And the handout you have just has some -- has what on it?

MR. NATHEN RICHEA: So yeah, it's Nathan Richea, with the Water Resources.

We posed an IR about this to the Company. They responded with some information, but the information came in different sources. So what we've done is compiled the information into one (1) document for ease of ref -- for ease of reference, and -- and to -- to explain and talk about these various things with the Company as part of the technical sessions.

THE FACILITATOR: It's Bill Klassen. I'll ask Mark to respond.

MR. MARK CLIFFE-PHILLIPS: Maybe just in light of Dominion needing to -- to review the materials, just to -- to make sure that it -- it matches with the submission that they had provided within their IR, if we move this to tomorrow morning, we'll have opportunity to speak to that. And we'll continue with other questioning, if you have other -- other questions not related to the handout.

MR. NATHEN RICHEA: Thank you. It's Nathan Richea, with Water Resources.

And we can provide it to the Board, if they want it for the registry, and -- and things of that matter, so.

THE FACILITATOR: Okay, thank you. Are there other questions on the water topic? Environment Canada, go ahead.

MS. MEAGAN TOBIN: Yeah, this is Meagan Tobin, with Environment Canada. This is just a comment on the presentation. I noted that they -- they're doing a supplemental baseline hydrology for 2015.

I was just wondering if the water quality supplemental baseline program was also going to be extended through 2015?

(BRIEF PAUSE)

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. Sorry, we -- too many questions at one time here. We've -- we -- we're segregated in multiple conversations.

MR. JOHN FAITHFUL: John Faithful, Golder Associates. The -- the plan is for a water quality program to -- to accompany the hydrology program with -- with respect to -- to its plans for -- for supplemental monitoring this year.

MS. MEAGAN TOBIN: Okay, great. Thanks. Meagan Tobin, with Environment Canada. I just -- one (1) follow-up question.

With regards to the AEMP, which I know is usually deferred to the water licencing stage, are -- is this baseline program going to supplement and inform the decision making for the locations of the AEMP? I'm just wanting to make sure that the baseline that we're covering now is going to be useful for the eventual AEMP.

MR. ERIC DENHOLM: It's Eric Denholm speaking. Yes. Yeah.

MS. MEAGAN TOBIN: Meagan Tobin. Thank you.

THE FACILITATOR: Todd has a question.

MR. TODD SLACK: Can I -- I have got two (2) short ones. I think one actually might be hard to -- to answer, but in -- in listening to Gord's conversation it brought back part of the Snap Lake discussions, and one of the things that the leadership was rather astonished to -- to learn is that Snap Lake will be 90 percent effluent by the time we get around to thinking about closure on that.

So we're -- we have a number of operations here. Can the project tell us what the percentage of Lac de Gras will be relative to -- or will be effluent? You know, so what's the flushing rate versus the -- the amount you're inputting into the lake?

(BRIEF PAUSE)

MR. JOHN FAITHFUL: John Faithful, Golder Associates. We're talking about two (2) very different systems with respect to Snap Lake being a much smaller lake compared to -- to Lac Gra -- de Gras being a -- a very large lake. And I think there is -- as part of the discharge process there is going to be mine water that enters into -- into Lac de Gras through Lac du Sauvage.

There is a -- there is a substantial assimilation capacity within Lac de Gras. And on top of this, it's -- it's also -- it's -- it's -- you're also dealing with the -- the cumulative effects that we've -- we've included in our assessment.

MR. TODD SLACK: It's Todd Slack, with the -- the Yellowknives. And I -- listen, I've been to Lac de Gras. It's a big lake. I get that.

But I'm just wondering, can you put a number on that, like a percentage?

(BRIEF PAUSE)

MR. TODD SLACK: And if it's helpful for time, if you want to take this away, that's fine too.

(BRIEF PAUSE)

MR. JOHN FAITHFUL: John Faithful, Golder Associates. I think, Todd, what we could -- what we could agree to do is -- is to look at -- to provide a comparison between the -- the volumes of Lac -- Lac de Gras and -- and Snap Lake.

I think for the purposes of the -- or -- or to illustrate or to -- to really hit home the differences between the two (2) systems, I think coming up with a -- with a particular ratio when you've got a number of different inputs would -- doesn't provide any value to -- to -- or affect any of the conclusions that we've made with respect to our DAR assessment.

DR. KATHY RACHER: Kathy Racher, for the Board. So -- so you've agreed to just try to slap some numbers together for comparison. I -- I do think it's a reasonable request and, you know, just to compare, yeah, the -- the volume -- the potential volume of effluent in the year versus the -- the total volume of Lac de Gras in comparison to Snap Lake.

Snap Lake has been a big topic of conversation. I think you're right. I think the situation is significantly different. But if there's an easy way that you can show that difference, I think that could be very helpful.

(BRIEF PAUSE)

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamonds -- Dominion Diamond. Sorry, somebody says "Diamonds" here, so.

These are very different scenarios on different lakes, but I think what we can do is we can take this away as -- as an under -- undertaking is the two (2) week period? Yes. An undertaking and come back with something that -- that satis -- satisfied Todd's request.

MR. TODD SLACK: Thanks. And that -- that's great, because it is -- it is one (1) of those things. I mean, hey, when people say it was 90 percent, that causes concern.

But if I could add one (1) other item to that, is what is the residency time of water in Lac de Gras? How quickly does it flush? Because that's going to affect it as well.

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. That -- that could form part of the -- the undertaking, I think.

MR. TODD SLACK: Great. And then the simple question, trademark, is there -- in terms of construction there's a shoal relatively close to the dike. It's less than a kilometre away.

And I'm wondering if the project can commit to secondary monitoring at this site to ensure that it's not receiving sediments that would cover over potentially important fish habitat. And I'm saying that today because of TSS, not because of fish. So there you go.

(BRIEF PAUSE)

MR. RICHARD BARGERY: Richard Bargery, Dominion Diamond. I think we'd -- we'd like to still defer this over to the fish, because we have someone that's not -- not here that we -- we can have a discussion about that tomorrow -- tomorrow morning, or whenever -- whatever the time frame is now.

THE FACILITATOR: Okay. It's Bill Klassen. Rather than take up time here with the list of responses that Dominion Diamond will be bringing back tomorrow, staff will be -- the Board will go over that with Dominion Diamonds (sic) and then that list will get posted on the registry so that all are aware of -- of that. So we'll continue to use the remaining time for questions.

Are there other questions --

MR. RICHARD BARGERY: Bill? I'm sorry. I -- I don't -- Richard Bargery, Dominion Diamond. I don't have a question, but I think we can respond to Barry's -- Barry's chart, at least a preliminary response. Mike -- Mike can provide at least a preliminary response now, and that may be...

(BRIEF PAUSE)

MR. MICHAEL HERRELL: It's Mike

Herrell, from Golder. Can we -- can we pull up the -- the water quality presentation, please? And perhaps slide number 19. So I -- I've taken a moment to -- to review this -- this chart to come back to the IR that GNWT was referring to. It's IR GNWT-62. The request was there's a -- a paper that was published in -- or was presented at the -- as a -- as a poster at the ICARD conference in St. Louis in 2006 on the -- the relevance of -- of meromixis in pit lakes.

And what that paper was was a summary of pit lakes that have -- that have demonstrated to establish meromictic conditions and the -- the stability of those meromictic conditions. And -- and the request was to draw parallels from -- from that paper, the -- the pit lakes that were presented in -- in that paper to -- to the -- the Jay project.

GNWT has provided a handout that -- that is based on a response that provides -- that indicated several pit lakes and what the -- indicating that meromictic conditions would occur and has provided a ratio of the mixolimnion concentrations to the -- the monimolinion concentrations.

I will seek out clarity of the relevance of what that ratio actually means, but before I do that I would like to start by talking about the -- the work that has been done at -- at the -- for the -- the Jay project. Several models have been updated and these are robust models that are hydrodynamic models that account for several processes, not just the concentration in the mixolimnion and the monimolinion. It's a hydrodynamic model to pre -- that will generate currents within the lake and evaluate whether the pit will overturn or not based on starting concentrations in the -- the mixolimnion and the -- the monimolimnion.

So what the model will do is it'll -- it'll account for wind-driven mixing forces in the model, temperature within -- in the convection in -- in the lake, as well as the density differences of the -- the mixolimnion and the monimolimnion, which is more of a -- which is the -- the key control on whether meromix -- meromictic conditions will establish within the pit lake.

And based on the -- the predicted water qualities for the mixolimnion and the monimolimnion, it's likely that the meromictic conditions -- well, it's not likely, it -- it is -- it's predicted that meromictic conditions will occur. These waters are -- have very high density differences. So, for example, in the EA assessment case, the monimolimnion concentration in the Jay pit that we see on screen here is roughly 2,500 milligrams per litre versus less than -- than a hundred (100). So there's a high level of confidence that these -- these pit lakes will remain stable in the long term.

I'm -- I'm not sure computing a ratio of the mixolimnion and the monimolimnion concentrations will provide any insight into the stability of the pit lakes, because there's several other factors that can affect that, and it's -- including the -- the density, the volumes of the water that's stored in the -- the monimolimnions and the mixolimnions, and the depth of the -- the depth of the -- the fresh water cap.

However, what -- what I can state is that, based on the modelling done to date and on the literature -- and the key purpose of that response was to indicate that several pit lakes have -- have demonstrated meromictic conditions. And several of the pit lakes that were provided in that response had much lower density gradients than what is modelled to occur at the Jay project. So there's a high level of confidence that meromixis will occur at the -- in the Jay pit, and also in the -- the Misery pit.

MR. BARRY ZAJDLIK: Barry Zajdlik, on behalf of GNWT. Thank you for that explanation, but the reason for conducting the ratios was to see in a different how the predictions made by DDEC fit in with other predictions in meromictic lakes.

So I used the case studies that were provided and looked at the ratio of the end lake concentrations in the top layer stratified and the bottom layers. And you'll see that the DDEC predictions are an order of magnitude more optimistic in terms of sequestering the high saline waters at the bottom of the pit. And that has obvious implications to discharge.

The -- the concern here is that, if the ratios are biassed -- and I have some questions about the modelling that was done -- but if these ratios are biassed low, then the predicted TSS concentrations in the mixolimnion are going to be much higher than -- than predicted here.

So that's -- that's a preamble to the questions that I have. The first question is: In terms of the drivers of stratification, I know that -- that the densities are important. But, you know, your ratios are so different than the case studies. Can you comment as to why the ratios are different?

(BRIEF PAUSE)

MR. MICHAEL HERRELL: It's Mike Herrell, from Golder Associates. So the ratios will be different. I mean, in my -- in my opinion, I don't think it's a meaningful estimate of the stability of a pit lake. I think a more meaningful estimate of stability of a pit lake is a hydrodynamic model, which we have developed as part of this project.

To answer your question, though, on the ratio, the reason they're different, this is an outcome of a detailed and robust comprehensive model that was completed as part of the project that included a hydrogeological model input, a detailed site water quality model -- model input, and also the -- the Water Management Plan that has been developed for the project.

To speak to why they would be so different, I think it would be driven mainly on the water management strategy that is specific to the Jay project which calls for pumping of a lot of fresh water from Lac du Sauvage into the Jay pit at closure.

So to put this into perspective, the water that's pumped from Misery at closure, I believe, under the EA assessment case, the -- the mix concentrations that end up in the monimolimnion are greater than 2,500 mil -- milligrams per litre of TDS, whereas the concentrations in Lac du Sauvage, the mean concentration, is roughly 16 mil -- milligrams per litre.

So you're putting water of 16 milligrams per litre on top of higher TDS water, you're going to get a much different ratio.

MR. BARRY ZAJDLIK: Is there a way to do a sensitivity analysis to look at what the key drivers of this -- of the stability of this stratification is?

MR. MICHAEL HERRELL: It's Mike Herrell, from Golder Associates. Yes, there is. We -- we've actually done a sensitivity analysis as a part of this process. In the -- the key drivers -- one (1) are density, and the other one is the -- the wind sheltering coefficient, so wind -- wind generation and -- which will cause wind-driven mixing in the pit -- in the pit lakes.

So we've -- we've done a sensitivity analysis. The original predictions were based on a wind sheltering coefficient of point five (.5). That was updated to point eight (.8), so we increased the -- the wind influence by 30 percent. And the outcome of that was, there was some additional mixing, but the -- the conclusions were the same as in the DAR.

So based on several sensitivities, meromictic conditions are going to form within the Jay Pit and the Misery Pit, and remain stable in -- in the long term.

MR. BARRY ZAJDLIK: Barry Zajdlik, on behalf of GNWT. You mentioned one -- one exercise they did with respect to sensitivity analysis. Were there others?

(BRIEF PAUSE)

MR. MICHAEL HERRELL: It's Mike Herrell, from Golder Associates. Yeah, so the -- the two (2) cases are sensitivities that I was -- was referring to, the first one was the DAR assessment case, and then the other one was the updated assessment case which was described as part of the presentation this morning.

Also as part of the -- the IR -- IR responses, we've done another sensitivity for the reasonable estimate case to evaluate what the more likely concentrations of the -- the discharge are going to be during operations and at closure, and that -- that model sensitivity resulted in -- in a -- in a lower TDS concentration in the Misery pit during operation.

So the Water Management Plan was still the same, that at closure, 50 metre -- the upper 50 metres of Misery was pumped to the bottom of Jay. However, in that sensitivity, that produced a much lower density in comparison to the DAR predictions. And even under the -- the lower densities scenario, meromictic conditions were still identified to form and remained stable in the long term.

MR. BARRY ZAJDLIK: Correct me am I wrong -- if I'm wrong, but in that scenario you talked about with the lower density gradients, did you also consider the effects of salt exclusion?

MR. MICHAEL HERRELL: It's Mike Herrell, from Golder Associates. Yes, we did.

MR. BARRY ZAJDLIK: Barry Zajdlik, on behalf of GNWT. So you actually modelled the effects of salt exclusion on the stability -- or that meromixis?

MR. MICHAEL HERRELL: It's Mike Herrell, from Golder Associates. So, yes. The -- the way it's included in the model is during the winter, an ice thickness of 1.5 metres is assumed in the -- in the model, and that will reject salts into the mixolimnion, and increase the density of the mixolimnion under ice.

So that is accounted for in the model.

MR. BARRY ZAJDLIK: Barry Zajdlik, on behalf of GNWT. Maybe you could help me understand the sentence, then. It says:

"Although the W2 model used to predict pit stratification can model formation of ice cover, it does not include salt exclusion."

That's in Appendix 8-G.

MR. MICHAEL HERRELL: Yeah. It -- it's Mike Herrell. We'll -- we'll -- for Gold -- for -- from Golder. We'll look into that, and we'll provide some clarity around that statement.

MR. BARRY ZAJDLIK: Barry Zajdlik, on behalf of GNWT. Could you also provide the sensitivity analysis that lead to the conclusion that meromixis will be perennial?

(BRIEF PAUSE)

MR. MICHAEL HERRELL: It's Mike Herrell, from Golder. Just to clarify your question, you're asking that the -- by stating, "perennial," that it -- it won't be stale throughout the year? Is that correct?

MR. BARRY ZAJDLIK: Barry Zajdlik, on behalf of GNWT. No. Perennial, I think you're referring to the lakes being stratified forever, so not just over the course of a year, but in perpetuity.

(BRIEF PAUSE)

MR. MICHAEL HERRELL: It's Mike Herrell, from Golder Associates. So the long-term modelling was actually completed as part of the DAR, and that's provided in Appendix 8G. The CE-QUAL model was only run for a period of two hundred (200) years but to evaluate the long-term, fifteen thousand (15,000) years into the future, stratification in -- in the pit lakes, that was done as a vertical slice spreadsheet model. And the results of that are provided in Appendix 8G.

MR. BARRY ZAJDLIK: Barry Zajdlik, on behalf of GNWT. Yes, I understand. I've looked at those -- those results, but I don't see how they're linked to the sensitivity analysis. What I'm looking for is perturbing some of these coefficients that are used in the modelling.

And Sachi actually raised a -- a point that I hadn't considered before. There is uncertainty into the groundwater inflows, but there may be also uncertainty in terms of the ratios of groundwater to surface water in these pits. So there are several levels of uncertainty that I don't have been in -- in -- considered in the sensitivity analysis.

(BRIEF PAUSE)

MR. MICHAEL HERRELL: It's Mike Herrell, from Golder Associates. So as part of the IR responses, we -- we developed what we referred to as the compendium of supplemental water quality modelling. So the sensitivity analysis that I was referring to were also updated as part of the -- as part of those vertical slice spreadsheet models. So all -- all those models were updated for the different sensitivities that I'm referring to. And those are provided in -- in Appendix B of the IR responses.

In terms of cert -- uncertainty in the groundwater inflows, that has also been addressed as we presented this morning. A reasonable estimate case, which accounted for lower groundwater inflows, was also completed as part of -- as part of the -- the ongoing work. And that -- that was also updated for the post-closure period, which formed the basis of the flows that were included into the -- the hydrodynamic models to evaluate the stability of the pit lakes in post-closure.

And based on the -- the lower conservatism that was included in that, with the lower groundwater inflows, meromictic conditions still established within the pit. So there's a high level of confidence based on the -- the sensitivities that have been done that meromictic conditions will form.

MS. SACHI DE SOUZA: It's Sachi De Souza, with the Board. Just to confirm one (1) thing about the -- the reasonable cas; that was reasonable, but not necessarily the lower end of what is possible for the groundwater inflows? So you presented what is reasonable, so in my head, what is likely expected. So something in the middle of a curve. And you've showed what will happen at the high end.

But what you haven't necessarily showed is what will happen if it's lower than that reasonable case.

(BRIEF PAUSE)

MR. MICHAEL HERRELL: It's Mike Herrell, from Golder Associates. I'm not sure if the

Board is ready for my response, but --

MS. SACHI DE SOUZA: Ready. Very ready.

MR. MICHAEL HERRELL: Okay. So the -- the sensitivities that we -- we -- that we have developed, we consider that they're appropriate for the intended purpose of the DAR to evaluate impacts, recognizing that, yes, the concentrations may be lower than predicted. But at that point, the -- the approach to evaluating water quality may be a bit different once we have a clear understanding of what the lower end of the -- the concentrations are.

All the modelling that has been done to date indicates that TDS concentrations that will be produced will result in a density differences of high -- higher saline monimolimnion water versus mixolimnion water of a -- of a lower TDS concentration. However, if the monitoring -- and this is one (1) of the -- the key advantages of this project is it allows -- it facilitates monitoring through not discharging for the first five (5) years. It allows the opportunity to reevaluate water quality predictions, and that would be done if the -- the water quality was actually a lot less than predicted as part of the future closure planning and to inform mine planning.

MR. BARRY ZAJDLIK: Barry Zajdlik, on

behalf of GNWT. Thank you for that, Tom. This next point is a bit -- well, even flaky, but it really is driven by the claim that this will -- this meromictic condition will survive in perpetuity, and that's seismic activity.

There was a pit -- a water lined pit -- in BC that was affected by an earthquake that was 1,600 kilometres away. It actually induced an internal seiche and caused a breakdown of the chemocline.

And so my concern here is that even though this is a low seismic activity area, we're talking about a long time frame, and there's potential for it to be destabilized. And in terms of the pit lake in -- in the Jay pit lake which is expected to be fish habitat, that could have nasty consequences.

Can you comment on that?

(BRIEF PAUSE)

MR. MICHAEL HERRELL: It's Mike Herrell, from Golder Associates. BC is different, a seismically active area. In -- in the Northwest Territories it's a very low seismic act -- active zone and the -- the probability of such an event is considered very highly unlikely.

MR. BARRY ZAJDLIK: Barry Zajdlik. I think I'll let that go. Thanks.

MS. SACHI DE SOUZA: Sachi De Souza, with the Board. So there was an initial homework question there and it went a little bit further, and I -- I don't think that's an additional question. And I would just like to clarify on what we are asking Dominion to do as a question.

MR. BARRY ZAJDLIK: Barry Zajdlik, on behalf of GNWT. There's some answers in the appendix of the IR responses that I'd like to look at before I come up with a homework question, because it's possible the answers are there.

MS. SACHI DE SOUZA: Okay. Sounds good.

DR. KATHY RACHER: Kathy Racher, for the Board. But there was the one (1) about the -- the sentence in the append -- or I don't know if it was an appendix or annex that had said something that they -- they said was different here.

MR. BARRY ZAJDLIK: Barry Zajdlik, yes, on behalf of GNWT. Yes, there was a disconnect between what was said here and what's written in the -- of the Appendix 8G which says specifically that the W2 model does not include salt exclusion.

(BRIEF PAUSE)

THE FACILITATOR: Okay. With that clarification, I'd like to assure people that there will be an opportunity to address the water topic again tomorrow before we begin the -- the fish topic, if there are items that weren't addressed today that -- that still need to be addressed. I trust that's okay with the Developer. You'll have the people available tomorrow to deal with water matters again.

Okay. Well, then I -- I thank everyone for being here and taking part today. This has been very interesting for -- for me, not having any active background in this. So I -- I'm going to go home tonight and google all these terms that I've been -- yeah, I've got homework. So we'll back at this at 9:00 a.m. tomorrow then. Thank you.

--- Upon adjourning at 5:05 p.m.

Certified correct,

Robert Keelaghan, Mr.