NEW PROSPERITY GOLD COPPER MINE PROJECT

FEDERAL REVIEW PANEL

CANADIAN ENVIRONMENTAL ASSESSMENT AGENCY

AGENCE CANADIENNE D'ÉVALUATION ENVIRONMENTALE

HEARING HELD AT

CARIBOO MEMORIAL RECREATION COMPLEX

GIBRALTAR ROOM,

525 Proctor Street

Williams Lake, British Columbia

Monday, July 29, 2013

Volume 7

FEDERAL REVIEW PANEL

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Williams Lake, British Columbia

--- Upon commencing at 9:11 a.m.

--- Opening ceremonies.

CHAIRPERSON ROSS: Good morning, everyone. First, a thank you to the Shuswap and Tsilhqot'in for the opening ceremonies.

Welcome to the fourth day of the topic-specific sessions of the public hearing regarding Taseko Mines Proposed New Prosperity Gold-Copper Mine Project.

My name is Bill Ross. On my right is George Kupfer, on my left is Ron Smyth.

The Secretariat staff generally are over in this direction, all over in this direction. They are identified by name tags and will be able to assist you with any logistic or process-related questions you might have.

I need to recap a few housekeeping items again.

Please use the south entrance on Seventh Avenue to the Gibraltar room as the main access to the hearing. All other doors for emergencies -- other doors, the doors over here -- are for emergencies and access to washrooms only.

I guess that could be classified as an emergency too. I've got to vary this for some fun.

We need to keep all doorways clear to comply with fire code regulations. In the event of an emergency, some lights up above me will flash or I will make an announcement over the microphone. In the event of a fire, please vacate the building in a calm manner. In the event of a medical emergency, let Secretariat and complex staff know immediately. First aid supplies and attendants are available throughout the complex.

The purpose of the hearing -- the overall purpose of the topic-specific hearing sessions is to provide an opportunity for experts possessing specialized knowledge or expertise to present to the Panel the results of their technical review of the potential effects of the proposed project.

The sessions are also designed to allow an opportunity to assess the technical aspects of the project and to provide opportunities for Taseko to explain the project and to respond to concerns and questions raised by other participants.

I would like to stress that although anyone may attend the topic-specific hearing sessions and observe the proceedings, given the purpose of the sessions only those presenting a technical review of the project and who have registered in advance as an interested party may present or ask questions at these sessions.

Today is day one of a two-day session on the aquatic environment. The agenda with the list of presenters is available to be picked up at the entrance, if you wish. Briefly, the presents we have today are Taseko, Environment Canada, David Williams on behalf of Friends of Nemiah Valley, and the Upper Fraser Fisheries Conversation Alliance.

The agenda may change somewhat depending on the length of time it takes for questioning. We ask that participants have some flexibility because of that.

Once we've heard from all the presenters, that will be by tomorrow, we will provide an opportunity for Taseko to respond to any of the information presented, if it wishes to do so.

With respect to scheduling. With respect to scheduling, we plan to sit approximately noon with an hour for lunch, and a break sometime in the middle of the morning.

We will resume at approximately 1 p.m. and continue until about 5 p.m. with breaks as necessary. We will resume tomorrow at nine a.m.

Now, let me look ahead a little bit. On Thursday, which is the last of the topic specific sessions, we have somewhat more presenters than can reasonably be accommodated. So we are taking three measures to try to deal with that. We're trying to make some adjustment to the schedule. We will be starting at 8 o'clock on Thursday morning.

I know that at the end of Thursday our goal is to finish at 5 o'clock so that people can -- people who are leaving can get home for the long weekend, and those who are presenting on Thursday, we may squeeze you a little bit for time.

So if there is anybody in the room who is presenting on Thursday and who has asked for an hour to present, figure out a plan B

that involves presenting in a shorter period of time.

Lastly, I now ask you turn off the ringers on your cell phones and pagers and remember that filming and photography are allowed only with my prior approval.

Are there any questions about the -- at this time? There haven't been so far so I wouldn't expect that.

In that case, I think we will proceed to the presentation by Taseko.

PRESENTATION BY TASEKO:

MR. GUSTAFSON: Just while the Panel is getting settled, I'll perhaps just briefly let you know who we have with us here today.

I won't re-introduce Mr. McManus or Mr. Jones that you've heard from already. With them at the presentation table is Mr. Greg Smyth, project manager at Knight Piesold. I introduced him briefly previously but you may recall that he has 15 years of experience in mine operation, design and environmental assessment.

With Taseko today, sitting over at the Taseko table are a number of consultants

who will be available to answer questions following the presentation.

We have Mr. Ryan Whitehouse, registered professional biologist with Triton. He has more than 10 years' experience dealing with water quality, fisheries and multi-disciplinary aquatic impact assessments.

With him also from Triton Consultants who is sitting at the back table on the far right is Mr. Michael Whelan, a registered professional biologist with more than 30 years of experience in fish, fish habitat and environmental affects assessment.

And finally at the back table is Mr. Dylan McGregor, principal geochemist with SRK Consulting. He is a registered professional geo-scientist, Masters of applied science in geochemical engineering and 15 years of experience. He advised Taseko with respect to the metal leaching and ARD characterization and development on the on-site quality predictions.

And as well, at the table to my right is Greg Yelland, chief engineer of Taseko Mines, and Cheryl Williston, who is the environmental coordinator of Taseko.

I introduced Mr. Yelland previous, but he has over 30 years of experience in mine design, economics and operations and Ms. Williston has seven years of experience in fish wildlife, habitat, inventory and management, and has been in the Williams Lake office for three years.

CHAIRPERSON ROSS: Thank you, Mr. Gustafson. Mr. McManus?

MR. MCMANUS: Good morning, and welcome to day seven.

Just before we start with this presentation, I wanted to bring up a few points that I think are important about the reliability of the information that Taseko is presenting.

Some questions have been asked of me through the day at the break and how we deal with that.

Over the next couple of days there's going to be lots of discussion about assumptions and models and simulations, estimates, and projections.

I need to be clear that Taseko has not asked their consultants to take a position on the merits of the project itself. Rather,

we've hired professional -- best-in-class professional organizations to apply their unbiassed expertise to the specific aspect that they are advising us on, whether they are providing designs or analysis or projections. So I wanted to be clear on that.

Nor have we asked them to speak to the significance of any of the effects. We believe that that is your job and our job is Taseko, and the EIS is a Taseko document, not a consultant's document.

Second point. Similarly, with our employees we've hired experts and professionals internally and we do not ask them to do or say anything which would compromise their positions as experts and professionals. And if they perceive that something that they are being asked -- does that, they are free to say no, and not to do so.

Third. It's in the best interest -- this seems to be getting lost in this. It's in the best interest of the company to present a project that we believe in and that they believe will be successful. It doesn't make any sense to put forward something that we think will

fail, so we need to put forward our best estimate of what we think will happen.

When we do reach the operating phase, our performance -- actually through all phases, our performance in meeting the commitments raised through permitting are closely monitored and if the company isn't meeting those commitments, the regulators have the authority to enforce the measures to make those commitments occur, up to and including pulling our permits which would stop the mine and shut us down.

So this isn't something we're doing lightly. We intend to work with First Nations communities, regulators, through all faces, permitting construction, operations and closure to meet those commitments.

Just as we listen to the debates that go on here in the next three or four days, I thought it important to say that.

With that, I would like to hand the presentation over to Mr. Greg Smyth.

MR. GREG SMYTH: Thanks, John. Good morning.

So I will be making a short presentation on essentially the summary of water

quality and how it's presented for the New Prosperity project, sort of a high level summary of some of the conclusions that were put forward in the EIS.

So there will be -- as we're doing on a number of these presentations, key points that we'll cover in the presentation, essentially that this is a common practice. Mines exist close to water bodies and lakes within B.C. and elsewhere. The design for the New Prosperity project is out there to protect water quality. With the design of the New Prosperity project, Fish Lake is preserved and protected, and through the conclusions of the EIS that there are no significant adverse environmental effects with respect to water quality.

As you saw in some of the slides last week, there are a number of projects within B.C. and elsewhere, where mines have been constructed and operated successfully close to water bodies, Endako mine in central British Columbia, Huckleberry mine here, tailings facility in open pit and waste rock, also in central British Columbia in the -- close to the Nachatko (ph) Reservoir, Mount Polley mine here in the

Cariboo, with Blue Check Polley Lake (ph) as well as Quesnel Lake in close proximity to the mine.

And a rather dramatic example of the Diavik mine in Northwest Territories where pits are excavated right in the centre of the lake with waste rock here in the centre of the screen.

Finally, the Taseko Gibraltar mine here just north of Williams Lake, tailings facility at the top of the screen, open pit and waste rock here in the centre, and Coulson like here off to the side and Fraser River is off to the screen here.

Then I'll show a couple of photos thereafter actually looking down from the waste rock dumps towards the lake here.

So here are the waste rock dumps that are at the Gibraltar mine looking down at the lake and that general proximity that exists today, and even a further kind of blowup shot on the other side of the lake, houses and properties that are on the lake looking back at the mine.

So here's a map that's been seen a number of times over the hearings here, and of course throughout the EIS. It's just meant to really kind of put the project in context. The

blue shaded area is the Fish Creek and Fish Lake Valley. That's a tributary of the Taseko River here that flows out of the Taseko Lake. Beece Creek is a tributary of the Taseko River south of the Fish Creek Valley. Then there's Little Onion Lake and Big Onion Lake here as well. You can see the reaches identified for Fish Creek, Fish Lake and then the various features of the mine, the pit, stockpiles, plant site and tailings storage facility.

The intent here is really to say that the mine design has been put forward to protect the local area, which is Fish Lake-Fish Creek steam and lower Fish Creek but as well the broader environment outside Wasp Lake, Onion Lakes and the Taseko River and on from there, obviously Chilcot-Chilcotin and Fraser river.

So I'm going to talk about water management in a moment and we use terms like contact water, no contact water a lot through the EIS, and just to try and put context for contact water.

Essentially, it's any water that touches any kind of excavated materials at the site, whether it be tailings ground up, waste

rock or other materials that are excavated throughout the site.

This is actually a picture of the tailings pond at Gibraltar where fish have been placed within the tailings facility. And that's the look and the feel of the water. Of course it doesn't don't tell you anything about -- the chemistry is evaluated as well, but essentially it's clear looking water within the tailings facility.

From a context of water management. For mine design essentially what we're doing is looking to segregate contact water from non-contact water. And as you can see here, the main areas for contact water in the pit and stockpiles, the plant site and then the tailings storage facility.

Then what we try to do in the mine design really is say, okay, well, these are within the Fish Creek catchment. What areas can we keep segregated from that so we can beneficially use that non-contact water?

For the New Prosperity project, essentially ditches were placed around the facilities to collect contact water and also

divert non-contact water. There are some remaining sections of the Fish Lake catchment that naturally drains down to Fish Lake, and then other areas to the south where that is captured and then directed to the inlets of Fish Lake as well.

So essentially there's sort of a segregation of contact/non-contact water, use as many non-contact water as possible for the ongoing functioning of the lake.

Just some pictures of what we're talking about when we talk about ditches to keep contact and non-contact water segregated. It's not too complicated. There done all over the place and this is just an example of a collection diversion ditch at the Gibraltar mine.

One of the other key aspects for water management for our modern day mine -- and actually hasn't been the case for many decades -- is actually the re-use of water, and we heard about this last week.

Re-using water is essentially the best practice where you minimize the amount of extraction of new non-contact water and you try and re-use the water as much as possible throughout the multi-year mining process.

This is just a picture of the re-claimed barge at Gibraltar. It's a large barge where it's pumping every day -- every minute of every day in order to feed the -- in the mill to process the ore and extract the mineral.

So after primary water management, what other aspects of the design are there to protect water quality? And one of the key ones that has been recognized through the advancement of understanding for metal leaching acid rock drainage is segregation of materials.

So at the New Prosperity project this has been identified and utilized as part of the project design essentially identifying and segregating potentially acid generating waste rock and overburden and then transporting and placing it within the tailings facility, so that in the long term it can be sub-aqueous and can prevent the onset of acid rock drainage.

Third aspect of the design for the New Prosperity project is the design of the tailings storage facility. We're placing tailings in there, placing contact water, we're placing potentially acid generating materials that have been sub-aqueous environment.

How do we protect the receiving environment through that design? We heard a bit about this last week with respect to the basin materials within the tailings facility. This is just a map of the thickness of the glacial till naturally throughout the entire Fish Creek Valley and overlaying that is essentially the outline of the ultimate tailings facility.

This material overburden over top of the pit as well which is here would be used as the design for the core of the dam so we essentially put low permeability materials in the base as well as in all the dams and minimized the amount of sub surface flow out of the facility, thereby protecting long-term water quality in the preceding environment.

These are a couple of examples of projects where this is actually being done. Mount Milligan mine in central British Columbia, it's an earth-filled, rock-filled dam with low performable core. Here you can see some technicians essentially doing tests on it. It's placed in thicknesses anywhere from 300 millimetres to a metre thick, and then is compacted with equipment, then to the design

specification to minimize the amount of seepage through the embankment.

This is another example of the Fort Knox mine in Alaska, another earth-filled, rock-filled structure designed in a similar way.

A third example in South America, the Alanbura Project (ph) where you can actually see the zones of the earth rock-filled embankment, one being a low permeable core.

So once the minimize the sub surface flow out of the facility, what do you do with the flow that does go? So really it comes down to collecting that and seepage collection ponds, primarily.

This is actually a picture of the Gibraltar seepage collection pond with embankment near the top of the screen here, and essentially seepage collection pond collects any contact water off the surface as well as anything that throws through the drainage systems and underlayer systems of the embankment.

Then you can see a pump house here off to the right. Water is pumped back into the tailings facility to be beneficially used within the process.

So next layer. What do we do? We're managing water on-site, contact/non-contact. We're segregating materials for long-term sub-aqueous disposal to prevent (muffled) on set. We're designing a tailings facility to minimize sub-surface flow throughout the site. Now we need to do some monitoring and adapt a management.

So monitoring is something that is done at all mines really, surface water, groundwater, and various other things. This is just examples of stream sampling in the Gibraltar project. This is done on a regular basis and it's mandated under the Ministry of Environment for mining projects in B.C.

Samples of air quality is sampling essentially at the site, and groundwater sampling. This is a key one, of course, for tailings facilities as well as any other facilities within the mining project where you take regular samples -- summer, fall, winter, spring, or other periods throughout the year.

So a little bit about adaptive management. It's been discussed throughout the EIS and just -- this is just a graphic, really, that's been put forward to try and understand what

it actually means in the context of a mine.

So this is just over time you've got a percent of a guideline concentration on the Y axis. And you're moving along with your monitoring program and if you see some sort of a blip above what you expect, you can actually increase the monitoring frequency to make sure it's not just one off, and if it continues to increase then what do you do? You actually start investigating what's going on, you understand why it's actually increasing. Are you into a new area of mining that you didn't expect and you are getting new materials and that sort of thing.

Once you do your investigation you can apply mitigation and evaluate that. Once you understand it, you can devise a mitigation plan, implement those that have been thought through before and then evaluate what's going on, drops down.

If it's not enough, it's not quite below the expectation because you haven't -- the mitigations need to be more robust, you apply a device and apply a secondary mitigation if required. If it comes down below the expectation then you are kind of back to the typical frequency

of monitoring.

This is just sort of a another way of presenting adaptive management is really -- we predict as much as we can and then we actually devise plans to actually implement later on if it's not exactly what you think.

So following monitoring adaptive management, we kind of get back to the whole design to protect water quality. And that's really thinking about closure.

And in this New Prosperity project, it was thought through and said okay, we went we want to make sure we're extracting a mineral for a 20-year period, but we want make sure the materials that we are placing on surface are going to work in the long term.

So, essentially, materials are being excavated out of here and there's some materials being placed up here, the non-PAG waste rock that's re-claimed, and then the tailings and essentially acid generating materials were placed in the tailings facility, designed in an obscure manner, sub-aqueous environment -- long onset of ARD, and then excess water flows down, fills the pit, fills pit walls, essentially gets covered so

it prevents the onset of ARD from the majority of pit walls, then flows out to Fish Creek. So essentially there's near-term environmental protection but also broader-term environmental protection, long term.

So the EIS really summarizes how determination of no significant adverse effects with respect to water quality derived. And considering that the Fish Lake area is relatively undisturbed, the duration of the effects are long term but site specific to the Fish Lake watershed.

The frequently is continuous but gradual, allowing the application of adaptive management if required. And if required, given the very prudent water treatment methods available, the effects are considered reversible.

As a result, a significant adverse effects to water quality is unlikely. These are the conclusions and rationale put forward in the EIS.

So in conclusion, as a wrap-up to this short presentation, New Prosperity is a project in close proximity to water bodies, as you can see in other projects throughout B.C. The

mine design does protect water quality. Fish Lake is preserved and protected with this plan and the conclusions of the EIS are that there are no significant adverse environmental effects to water quality.

Then I'll pass it over to Scott Jones here who is going to present on fish and fish habitat I believe.

MR. JONES: Thanks, Greg. Morning.

The focus of my portion of the presentation here is the interaction of the project with fish and fish habitat. Couple of key points.

The re-design of the project doesn't result -- sorry, re-design of the project to preserve Fish Lake doesn't result in any changes to the effects on fish and fish habitat outside the watershed relative to the previous project, with the exception of the positive effects of the fish compensation elements that are proposed off-site.

As Greg mentioned, Fish Lake is preserved and protected addressing the previous concerns about the federal and provincial

government. And as a result, the EIS -- we've concluded no significant adversely affect on fish and fish habitat.

This graphic and the watershed, I think you are pretty familiar with that.

I just want to point out in review by the previous panel in 2010, there was no finding of any significant adversely effect outside the watershed and the re-design of the project to preserve and protect Fish Lake doesn't result in any increased or new adverse affects outside of the project, other than the effects obviously positive effects of the fish compensation elements.

I just want to talk about the mitigation built into the design here, and really we achieved three objectives. And the first was to relocate the tailings storage facility two kilometres upstream of the lake, and that achieves two things.

It provides enough space to monitor and mitigate control seepage and it maintains the maximum amount of spawning habitat upstream of Fish Lake.

Thirdly, we control the outflow

of Fish Lake and we circulate some of that water to the tributaries feeding Fish Lake to increase and maximize the available spawning habitat and maintain the level of Fish Lake.

This is just a slide that depicts the lakes in the Cariboo region. There's 13,000 lakes, and you can see here that two little lakes right below Fish Lake -- that's Taseko lakes, and Fish Lake is just -- Fish Lake and Little Fish Lake are just north of that.

I just want to take a minute and characterize Fish Creek itself.

Basically it's broken up into lower, middle and upper Fish Creek. Lower Fish Creek is depicted by this little green section. It is separated from a Little Fish Creek by a set of impassable falls. And you can see, sort of -- this is the falls right here in the foreground.

The flows in lower Fish Creek below the falls are seasonal. Here you can see flows during the freshet; then again in the same section later in the summer, it's dry.

Middle Fish Creek which is the -- from the outflow of Fish Lake to the falls, is a kind of a combination of meandering sections

separated by beaver dams and other sections that are relatively straight, ripples and runs. Again, here's another shot during the freshet and right at that same location later in the summer with the reduced flows.

This area right here, this is actually where the pit would be. And you can see the basalt bluff in the background and here's Fish Creek flowing left to right in the shot.

Upper Fisk Creek flows from the headwaters down the Little Fish Creek and then on down to Fish Lake, and again Upper Fish Creek kind of flows through in some meadows separated by beaver dams and in the low flow periods that water remains behind those beaver dams in deeper pools.

But, again, seasonal flows. Here's a shot of the Upper Fish Creek where it flows into Fish Lake, and upstream here's -- again, flows during the freshet, and the same location flows later in the summer.

Now, upstream at Little Fish Lake there's about a thousand metres of defined channel but flows have only been recorded there in May and June. So this is the maximum footprint. This is 20 years out within the watershed.

What this shows is fishbearing stream habitat, and these gold sections that come in on top of that, that's the spawning habitat at baseline that's supporting Fish Lake. Obviously the pit here removes that spawning habitat and the reduction flows, you lose the spawning habitat below that.

But the relocation of the tailings pond upstream allows us to retain all of that baseline spawning habitat.

The result is that with the project in place, we end up with over 40 percent of the baseline spawning habitat in place.

In terms of the Fish Lake fish. Current conditions. Considered over-populated. Small fish -- and in is just a graphic of kind of the demographic, if you will, of the fish within that. It's roughly a third juveniles, a third sub-adults and third adults. They range in size from about three inches to 13 inches.

Fish Lake is basically at capacity, and the reason I say that is because of the large population, the relatively uniform size distribution within those age groups and the fish health relative to other lakes in the area.

So as a result of the project, yes, we reduced the spawning habitat area but we regulate the stream flows and we monitor and manage that fish and habitat. And as a result, we're projecting a stable but smaller population. Think of it in terms of smaller number of fish in the same habitat basically end up with more habitat per fish on a per capita basis. So the result from that should be larger fish.

Obviously, if we don't see that increase in fish that we anticipate, we certainly have the ability through the adaptive management plan to add additional spawning habitat in those upstream tributaries.

We've had lots of concerns about the health of the fish that would be Fish Lake, particularly with respect to metal uptake. You've heard this about the fish in the Gibraltar tailings pond. They don't show up particularly well in this slide, but sitting in here a number of fish.

That's the fish in this tailings pond. Fish that we've got in the tailings pond have been up to five-and-a-half pounds. That's fish out of the tailings pond, if

you wanted to see that scale that's over 20 inches. Healthy looking fish.

Trying to predict metal concentrations, metal accumulations in tissue. Pretty complex, complicated undertaking because trying to understand the nutrient balance in the lake. If you are incorporating water quality predictions, the sediment predictions, it's pretty complicated stuff. Lots of theories out there, lots of equations, lots of different ways of doing it, but they give a broad range of results.

So kind of consider in terms of what better way to consider the potential for uptake in fish tissue than to look at Gibraltar. It's close, it's a perfect copper deposit. And this particular slide is in reference to a study they was done by Ministry Of Environment, published in the early nineties.

And it was metal concentrations in fish tissue from uncontaminated B.C. lakes, which was basically an analysis of fish tissue from over 50 lakes in B.C.; lakes that were considered unimpacted by human population.

So when we take the data from that study specific for rainbow trout and look at

the fish tissue data in that report, compared to the fish tissue data we have from Gibraltar, what we find is the fish in the Gibraltar, in the tailings pond, have 71 -- these are average values, average (muffled) values to average study values. Arsenic levels are 71 percent lower; cadmium 98 percent lower; copper somewhat higher, I guess not surprising, it's a copper mine.

Lead values lower; mercury lower. All of the values are lower in these that you see in these uncontaminated lakes. I'm not trying to suggest that that is exactly what we would see in Fish Lake.

What I think I am suggesting is that one would not expect to see significantly higher levels in a lake downstream of a tailings pond particularly when you've got the monitoring mitigation (muffled) that we've got in place.

So while preserving Fish Lake, there are affects to other fish habitat, including the loss of Little Fish Lake, and, as a result, we propose a suite of fish compensation elements in the fish compensation plan.

Boy, I would love to be able to say that all of these elements have developed in

full consultation with First Nations group and we're all on board. I can't say that. There hasn't any recent dialogue with First Nations, First Nations leadership about these elements.

But what we have been able to do is look at the information that's available in the public domain, particularly from Xeni Gwet'in, and looking at their -- the funding proposals, fish sustainability. Trying to get a sense of what is important to them.

So the elements in our plan, we've made best efforts -- at least in our view -- make sure they are at least aligned with our understanding of First Nations' objectives and concerns.

And certainly as we stated in the EIS, we're more than open to continuing dialogue, having dialogue about these elements.

I just want to run through them very quickly. The salmon spawning habitat, which is the Taseko Lake off-channel habitat that shows up. It's right at the outflow of the Taseko Lake into the Taseko River.

These are just a couple of examples where off-channel habitat has been put

into place, been successful. This is the lower Columbia River in Washington state.

Closer to home this is the Ashton Creek project, which is a run-a-river (ph) project. Spawning salmon here. This project apparently has been very successful. Spawning there.

This is just a rendering of what we're proposing to do soon our off-channel habitat. Those dimensions there on actually in feet.

But what we do know is that from our work so far we have good gravels, piesometer levels that we're seeing in terms of groundwater flow are good.

So we're very confident that this is going to work there. And we've also identified three or four locations a little bit farther downstream that are close to the Taseko River elevation in alluvial fan. So options -- something in this proves problematic as we continue investigating that.

Flow augmentation that talked about within the Fish Creek watershed itself.

Creek diversions and berm

upgrades and Haines Creek and Elkin Creek. Just some examples of that type of work that's undertaken.

Recreation access. Some options we put forward to the 11 Sisters chain and this is into Slim Lake. We've talked about the Hanceville hatchery, re-establishing that, and we actually used it -- I believe it was two years ago. We took about a thousand fry -- a hundred thousand fry, sorry, and used those to successfully out plant to Slim in here and another lake that's assigned a number that's out by Hundred Mile.

And fish passage restoration. So basically taking sections of stream where there has been some disruption to that flow that is impeding the travel of fish. A number of locations throughout the area. Just a couple of examples of what that looks like.

This is an example of a project Puncy Creek (ph) that Taseko has been doing with some First Nations youth. Typically, it would be replacement, repair of culverts and road crossings, is typically what that would look like.

I want to talk about the Taseko

River and salmon, because we've heard it's a huge concern for First Nations.

So previous review of the New Prosperity project concluded that there was no significant adverse effect on water. It concluded that there was no significant adverse effect on fish and fish habitat outside the Fish Creek watershed.

Obviously there's been changes within watershed, in the Fish Creek watershed, that requires, you know, the re-evaluation certainly of effects on water there. But specifically the 2010 Panel review concluded no significant adverse effects on fish health in the Taseko River.

So I said that there's been no changes in effects outside the Fish Creek water.

The changes in the project -- there's no changes outside the watershed other than the establishment -- really, the big one, I guess, being the off-channel habitat which you see is a positive impact.

Within the watershed itself, we've moved the tailings pond. We've re-located the stockpiles, the (muffled) stockpile and the

ore stockpile. But the loading parameters of all those materials, the characterization of those materials, the quantities of those materials, have remain unchanged.

All of those components are still upstream of the open pit. So anything outside the watershed should be unchanged. We see that conclusion remaining the same. No significant adverse effect on fish health in the Taseko River and downstream.

We talked quite a bit about adaptive management. Greg talked about how you do that with your monitoring system and the frequency of sampling. I just want to give a sense of -- I'll call them conceptual locations and types of monitoring that would be more specific to aquatic environment. So this is monitoring for fish health, everything to do with fish health and population and spawning and demographics.

Obviously, Fish Lake and the tributaries feeding Fish Lake and also the (muffled) channel habitat at Taseko lake, as well as that the off-site components of the fish compensation plan that just aren't on this map. So how successful are they? Are they doing what

we said they would do?

Monitoring of groundwater downstream of the embankments. South embankment, main embankment, west ridge. Sediments within the tributaries and Fish Lake itself and various locations monitoring dust, particularly in around the lake and the tributaries, around mining activities, around the tailings facility. Taseko Lake Lodge. I guess lastly those items related to water quality, and all the parameters that go with water quality -- flows and qualities.

I guess part of that, I just want to say that we believe this project has been very well designed. And part of good design, part of good engineering is identifying those things that can happen, designing out as many of those things that you can. But acknowledging that there are other things that remain possible. Making sure that you monitor for those things that are possible and not just monitor, but make sure you have mitigation plans, proven mitigation plans and procedures and methods available to you to address those should that occur.

And that's what that -- monitoring system in those locations and adaptive

management program does.

So I've been talking mostly about operations. I don't want to forget about post closure. Just while I have the slide up, there was discussion the other day about seepage along the bluffs to the west. Those are the bluffs we're talking about here. While I didn't show it on the previous slide, those are the obvious locations where we would be monitoring the quality of that seepage.

With respect to closure, Greg talked a little bit about that and basically post-closure. We end up with a watershed that, in general terms, returns the flow to its pre-project path -- pathways, if you will.

Instead of having a chain of two lakes, Little Fish and Fish Lake, end up with a chain of three lakes -- from the TSF flowing to Fish Lake, Fish Lake flowing to Pit Lake and then onto the Taseko River.

Certainly our experience at Gibraltar would suggest to us that there's good potential for both the tailings lake and the Pit Lake to be fishbearing, but we haven't made any attempts to try and quantify that or include that

as a component of the fish compensation plan.

So the EIS that we submitted concludes no significant adverse environmental affects to fish and fish habitat. And the rationale for that is, granted, the Fish Lake area is relatively undisturbed, and the duration effects are long term. They are site specific to the fish lake watershed.

The effects do occur once, and with successful mitigation there are no residual affects, and the significant adverse effect (muffled) unlikely. We say it's unlikely because our confidence -- our confidence in those compensation measures.

In conclusion, no changes or effects on the Taseko River relative to what was proposed in 2009 other than the positive effects.

Fish Lake is preserved and protected. That was the intent of this project. And no significant adverse environmental effects to fish and fish habitat. And that's all. Thanks.

CHAIRPERSON ROSS: Thank you very much, Mr. McManus. I guess we go through the usual list. First question is any -- sorry. Did

you --

MR. JONES: Is it okay if we go over there?

CHAIRPERSON ROSS: Yes. Forgive me for getting ahead. While they are moving over to their usual habitat, I will ask: Are there any questions from the Government of Canada? I see shaking heads.

In that case I will move on, hesitating just in case, but move onto any questions from the First Nations interested parties. Mr. Pearse?

MR. PEARSE: Thank you, Mr. Chairman. Is it okay if I inhabit the front table?

CHAIRPERSON ROSS: By all means.

MR. PEARSE: Tony Pearse for TNG.

I have a thousand questions, Mr. Chairman, but you'll be happy to know I've got just a handful I want to ask of Taseko.

I want to start with Mr. Jones's comment during his presentation about the comparison with Gibraltar fish tissue metal

concentrations compared to B.C. lakes.

I would ask him to comment on the fact that there's a difference between the surface water in a tailings pond and the pour water that would comprise the seepage that would escape the impoundment and go down into Fish Lake.

MR. JONES: I'm just wondering -- can you just repeat that for me Ton?

MR. PEARSE: Yes. In your comparison of metal concentrations and fish tissue between the Gibraltar pond and B.C. lakes, I'm asking you to, I guess, recognize that there is in fact a difference between pond water and what the concentrations in the seepage which are resulting from the pour water of the tailings is likely to be.

MR. JONES: That's a good question. Give me a second and let me ask my friend, Tony. Sorry for the delay.

I guess it's important to note, Tony, that the Gibraltar tailings pond is an active tailings pond. It's a functioning tailings pond, so the pond itself is closer to pour water quality than if it were not.

MR. PEARSE: Do you have any

data on that, that compares pour water deep in the tailings with your pond water or a seepage concentrations? And if you do, perhaps you could provide that to the Panel at some soon point.

MR. JONES: Specifically to Gibraltar? We do have water quality from within the tailings storage facility itself and in the seepage collection pond.

MR. PEARSE: And how do they compare?

MR. JONES: I don't know the numbers.

MR. PEARSE: Give us a data sheet that would compare the two.

MR. JONES: I believe we could do that.

CHAIRPERSON ROSS: Should I take that as an undertaking? Thank you, Mr. Jones.

MR. PEARSE: Mr. Jones, in 2009 when you were doing your alternatives assessment for the Prosperity project, you were asked at that time, really, to look at an alternative to the mine development plan that did not involve the draining of Fish Lake, the use of Fish Lake.

At that time you -- Taseko discounted the alternatives, the alternative of not involving the draining of the lake on the basis that seepage would result in significant impacts to fish water quality. Do you recall that?

MR. JONES: I recall the alternatives assessment for sure. I don't recall that -- I could probably clarify your statement. If you carry on, Tony.

MR. PEARSE: Did Taseko look at an alternative in 2009 that involved the protection of Fish Lake?

MR. JONES: Yes, we looked at two alternatives that did that.

MR. PEARSE: You looked at two alternatives in -- that did not involve Fish Lake?

MR. JONES: Yes. There was the alternative with the tailings facility located north -- sorry, south of Fish Lake, option two I think it was called. And the other alternative is one where we (muffled) tailings storage facility in the D'Angela (ph) drainage.

MR. PEARSE: In 2009 you sat at the Panel at the time that -- let me just quote:

"What happens to the water quality in Fish Lake if you try and preserve that body of water, the tailings facility right up against it? Is it over time the water quality in Fish Lake will become equivalent to the water quality in the pour water of the tailings facility, particularly when it's close. You might be able to delay that by moving the tailings facility farther away to Fish Creek South. You may even be able to minimize that, reduce it by mitigation measures that could be applied. But eventually the water quality will change."

Do you remember saying that?

MR. JONES: Absolutely. And if you look -- I believe it's the language in the transcripts prior to your quote. The first portion of that statement is related to the project that was being proposed at the time with the tailings facility right up against Fish Lake, which is why we have re-located the tailings storage facility to give us the room to monitor and apply mitigation.

And the last part of that statement is correct because the water quality in Fish Lake will change.

MR. PEARSE: In 2009, Knight Piesold wrote a memo for you that looked at what -- I think it was on request of the Ministry of Mines, at what the impacts would be to Fish Lake given the tailings facility right there and there was -- the numbers came back, I think there were eight parameters it would be significantly elevated in the lake.

So my question is: What would you anticipate the effects to be when you move the tailings impoundment two-and-a-half kilometres upstream in terms of the concentrations that would result in Fish Lake? What is the effect of moving the dam back two-and-a-half in terms of what happens in Fish Lake?

MR. JONES: The effect of moving the dam is that you're given the room, the space, the two kilometres in which to implement monitoring wells, pump back system, that you don't have with a dam right up -- actually, the previous professional at the toe of the main embankment encroaching in the lake, and the water quality,

the effects on water quality we predicted within the EIS, of the project as proposed.

MR. PEARSE: Well, before we get to mitigation, just without the pump back wells and so on, what would you expect the effect to be on the concentrations given that they've got two-and-a-half kilometres more distance between? Is it just a matter of the same concentration but a longer time to get to the lake?

Is it a matter of reduced concentrations because of potential dilution? What would be the effect? What is Taseko's assessment of the difference in having moved the tailings impoundment the two-and-a-half kilometres on Fish Lake concentrations?

MR. JONES: I think I'm having a hard time in understanding the question are you asking me. Are you asking me....

If you looked at the previous project with the tailings dam where it was located right up against the lake, to take what the water quality predictions would have been for Fish Lake given that scenario if Fish Lake was retained versus what's being predicted now?

MR. PEARSE: In 2009 you looked

at an option on the request of the Ministry of Mines and said, what if you just were to save Fish Lake, what would the effects be of having the tailings impoundment right there? And you produced a -- Knight Piesold produced a paper and it had a serious result.

So the question is: Given that, all you've down now really is moved the tailings impoundment two-and-a-half kilometres upstream. What is Taseko's assessment of the effect of having moved that distance? I guess the second follow-up to that is, where in the environmental assessment would the Panel expect to find that assessment, or where can they find it?

MR. JONES: I don't know, maybe the short answer to the question, Tony, is if the tailings facility had not been re-located, if the tailings facility had remained as proposed in 2009/2010 and Fish Lake was maintained, water quality in Fish Lake would eventually end up being the same as the pour water quality in the tailings facility.

From the project that we put forward, we're predicting the water quality as we've laid out in the EIS.

MR. PEARSE: Certainly now, given you've moved the tailings impoundment back, you've got an opportunity, as you say, to put in pump back wells and collect. So I guess the next question to that is: Have you modelled what the effect of treatment would be on the water quality? Is the treatment process part of the modelling work that Taseko has performed here?

MR. JONES: You are talking specifically about water treatment? Is that part of the model?

MR. PEARSE: Yes. Did you model -- I think you've modelled the effects without mitigation in your water quality models. I guess we're talking about the SRK Fish Lake recirculating model.

So having modelled the effects of the treatment that -- the water quality treatment incorporated those into your model, into your predictions.

MR. JONES: No, we haven't incorporated it in the model. We've looked at, based on the water quality predictions for those elements that the model puts out, elements that could be above guidelines ultimately. We've

looked at what the volume of material, volume of water that would need to be to treated to achieve, make sure we stay below water quality guidelines. It's not incorporated in the model.

MR. PEARSE: I guess I mean it strikes -- did you not think that the Panel might like to have that kind of assessment in front of it so it could understand what it is you are proposing to do and how effective the treatment would be in getting those concentrations down?

MR. JONES: I guess we didn't make a judgment as to -- try and guess what the Panel would like. We kind of took the IRs, SIRs and the additional technical information required and address those, assuming that's what the Panel is asking for.

MR. PEARSE: Thank you. Environment Canada submitted their -- in their submission, I just want to go to a particular location there. I assume you have read or had an opportunity to look at the Environment Canada submission? And if so, could I take you to page 21 on that?

MR. JONES: Just give us a sec, Tony, we've got to pull it up. Got it. Thanks,

Tony.

MR. PEARSE: So on page 21, talking about the water balance and they are talking about a previous water balance that you used that had a sensitivity analysis for it about precipitation and runoff and so on, upper and lower bounds. And they were concerned in this, sort of, new operational water balance they use the term it's been simplified where essentially you've abandoned that sensitivity analysis component. I would ask you: Why did you do that?

MR. JONES: I can't speak to that. I don't know that for certain.

MR. PEARSE: Dr. Desbarats the other day talked about having done a very conservative model using your numbers for precipitation, and I kind of misquoted him at the time, but there's a real issue here that had you done a sensitivity analysis about the amounts of water that could flow or not flow into the tailings impoundment on a long-term basis annually, whether or not -- I mean, the issue is could the PAG rock, for example, ever become exposed?

So you've done a water balance

model. It sounds like, from what Environment Canada kind of dumbed down a bit, you haven't looked at the full range of stuff. And Dr. Desbarats made it clear that a more realistic taking in the natural variation, that kind of modelling is yet before us.

So at this point we really don't have an understanding of the full range of possibilities in terms of the water level and impoundment; is that correct?

MR. JONES: I don't think that's correct, Tony. That's kind of hard to -- you don't have a full understanding of variability in water flows....

MR. PEARSE: Mr. Jones, you may very well have a full understanding of it, but the point really, I think, is the Panel has to understand. Where can they find this in the assessment? They have to be able -- have a reasonable sense that there's virtually no chance that the PAG will ever become exposed, for example. Where in the EIS would this information be found?

MR. JONES: Is the information that you are asking is, where is the rationale for

a simplified water balance? Is that the question?

MR. PEARSE: No. Where does the Panel get a good assessment that's realistic, long term of what the water levels might look like in the impoundment particularly in the long term. Post closure?

MR. GREG SMYTH: Greg Smyth here. I'll just respond to a couple of these.

So in the previous EIS there was an approach taken to look at the variability of climatic conditions across the site. And through the back and forth with -- and the hearing process with Environment Canada and others, sort of a number of different iterations of that were done to try and bracket it to the sufficient approval of Environment Canada, if you will.

That process looked at it in a number different ways. I don't really get into it. I don't need that's necessarily what we need to be getting into right now.

But it looked at a mean and it looked at a number of scenarios on the low side, a dryer side and wetter side. And this time, the approach that was taken was not to discount that but really to come up with a particular model that

would look at both mean, average conditions, and also dryer or wetter scenarios, not just looking at means or averages but actually the range, which we did. And it closely matches essentially what was done previously.

So within the various documentation within the EIS, there are -- the simplest thing would be to look at graphs that present the growing pond volume within the tailings facility over the life of the project. And there are a number of graphs that are certainly within the sections that related to water management and the various appendices that have been generated to look at the growth of the pond over time.

And it looks at it over mean conditions, as well as the bracketed range. I think we used 95th percentile on the dry and the wet side. I would have to confirm that. That's essentially the approach that was taken this time.

I think Environment Canada did have a number of questions that they may ask later on in the hearing that we can talk to, but I think also their end conclusion was there's a growing pond in there over the life of the project and,

therefore, that seems like a reasonable mitigation for, you know, dryer conditions later on in order to maintain a pond over the PAG waste materials. Does that answer your question?

MR. PEARSE: Sort of, but I'm not going to pursue that. I'm glad I have you up at the mic, Mr. Smyth, because I wanted to ask about the water quality modelling that Knight Piesold did.

First, let me just make sure that I understand the -- I think there's three water quality models that have been done. There's an SRK one, the Knight Piesold one and then there's the Triton modelling. And if I get this wrong I'm sure you'll jump on me.

As I understand it, the SRK did the work that relates to the Fish Lake circulation component of the mine. And Knight Piesold did sort of everything else outside that piece in terms of the adjacent lakes and waters. Is that correct?

MR. GREG SMYTH: That's correct.

MR. PEARSE: And in the EIS, page 706, it says that complete details for these

two metals are found in two different appendices.

I would actually like you to, if you can, put up -- and maybe you have to come over here to do this -- I just wanted to put up very quickly the Knight Piesold report on the water quality model. Just spend 10 seconds with it. If can you bring it on the screen or --

MR. SMYTH: I can't put it on the screen. Maybe the Secretariat can help?

MR. PEARSE: Unless the Panel is able to do that on their computers. I wanted to look at the table of contents of that report.

CHAIRPERSON ROSS: We may be able to recover it here if I knew something about it's CEAR number, or some such information, date of submission.

MR. PEARSE: Mr. Smyth, do you have the CEA number?

MR. GREG SMYTH: I've got the appendix number.

CHAIRPERSON ROSS: That's fine.

MR. PEARSE: The appendix is 2.7.2.4, B to G.

Looks like we have it on the screen, Mr. Chairman. That's good.

Now, just before I get into this I just -- I mentioned the two models. And the third model is a model that I believe Triton did. And what they did is they based -- and that really took, as I understand it, the SRK information and looked at sort of the biological effects -- modelled biological effects in Fish Lake. So those three models are kind of -- that is sort of the relationship, is the Triton one is based on the SRK one to understand what the biological effects are in Fish Lake. Is that correct?

MR. GREG SMYTH: That's correct.

MR. PEARSE: Now, we have up here the table the contents. Mr. Chairman, I just want to ask the company, or Knight Piesold, to look -- so this is a report on the water quality modelling for the area, not including Fish Lake. And you can see that there's a discussion of the model itself where things were done, the parameters that were modelled, the assumptions, inputs, et cetera, treatment of the discussion of the results. It's all here in a lot of information, and there's conclusions.

And down here there's some appendices, and you'll note there's a guideline, summary stats, tables, all the Excel spreadsheets, then the concentration graphics which are the pictures that show.

Now, I just want the Proponent to ask why, given this as an example -- and this is information that was requested a number of times by TNG for the SRK model. When you go to the same appendix for the SRK all you get is appendix C, a bunch of 148 pictures of graphs without any of the rest of it.

Now, given that, where in the environmental assessment can the Panel go, can a reviewer go to find out the whole explanation of what was done for Fish Lake?

MR. JONES: I think it's in the response to IR 16, Tony, if you have that.

MR. PEARSE: IR16. The question was raised a number of times through the information request process. But, in fact, those answers didn't really deliver the goods. We never got to a place where you could say in the EIS: This discussion, this reporting out of results is available.

So the Panel, in order to evaluate the SRK work, has nothing sort of coherent anywhere in the body of material you've submitted to evaluate that. I'll throw that out there and ask you to respond. And if you think there is somewhere, let us know where we can go to get it, where can we find it?

MR. JONES: I guess I would ask whether the Panel is able, whether they have what they need, Tony. Is the question whether the Panel has it or whether you have it?

I realize, Tony, because we saw this request from TNG quite a few times asking for additional clarity of the models and how they work. We made our best efforts to try and explain that, but it doesn't sound like we were particularly satisfying in that in terms of explaining that.

MR. PEARSE: Well, I mean I'm going to leave it to the Panel to decide if they can find this information to verify the model.

So let's now go to -- let's now go to the Triton report which is based on the SRK modelling work for which we don't have a lot of information other than a bunch of graphical

pictures in the SRK appendix.

On the Triton report on page 3, this report -- let's, first of all, clarify the role of this report.

The Triton report, which is the predictions of what the water quality impacts or effects on aquatic life are for Fish Lake is arguably one of the critical documents in front of -- as part of the assessment because the assessment is focused on preserving Fish Lake. Agreed?

MR. JONES: I would say it's important.

MR. PEARSE: Not critical? Can't get that out of you?

CHAIRPERSON ROSS: Let's move on.

MR. PEARSE: So on page 3 you say the first thing that you did was you evaluated maximums to characterize potential worst case scenarios, and then you go on to say, you kind of moved onto average numbers for your analysis.

Is the treatment or the assessment of the maximums, was that submitted as part of the environmental statement? Is that

information in front of us or just the average numbers in front of us in the Triton report?

MR. JONES: Sorry, Tony, my apologies, I was talking when you started that.

MR. PEARSE: You say on page 3 that you first got into looking at the maximums in your assessment and then you moved onto the average concentrations because these were considered more reflective of typical conditions.

What did you do with the results of the maximums? Was this information put into the material or is that somewhere on a back shelf somewhere else that we haven't seen?

MR. JONES: Tony, I don't know that, we don't know that rate here. We would have to look into that.

MR. PEARSE: Would that be an undertaking, Mr. Chairman, that Triton or Taseko would get back to us and if you have the results for the maximum concentrations that would, I think, be helpful to us because it gives us a range of what might happen in Fish Lake.

CHAIRPERSON ROSS: The question has been posed. Would you undertake to do that?

MR. JONES: Yes.

CHAIRPERSON ROSS: Thank you.

MR. PEARSE: I just want to the jump to the Fish Lake mitigation report. I have a couple questions about that and we'll go to page 35. We're looking at appendix 2.7.2.4, B to D.

Page 35 is the last page. Here you are talking about risk and associative mitigation. In the first paragraph it says:

> "Lastly, a plan will be established for fish salvage in the event of prolonged shut down."

You are talking about would what happen if the flows stop, what kinds of mitigation measures you can use to deal with, say, failure of pumps loss of power, damage to pipelines, et cetera.

So I would ask you to explain what this fish salvage operation would do to mitigate the impacts of a pump failure or some other event in terms of dealing with the objective of preserving Fish Lake as a fully functioning aquatic ecosystem.

There's a -- I would put it to you that there's a huge gap between salvaging fish when you have a problem and saving the lake. So

if you would comment on that gap and what that mitigation measure actually achieves that would be helpful, I think. Thank you.

MR. JONES: Sorry, Tony, I'm not seeing the part about fish salvage. Let me just talk to temporary closure. Maybe that will answer your question.

Temporary closure is not something where suddenly everybody leaves the site. Temporary closure there is a presence on site. I will give you an example. When Gibraltar was temporarily shut down there was 10, 12 people there, and part of their job is making sure the key pumps and key things related to environment are maintained.

MR. PEARSE: I'm not talking temporary closure. I'm talking about what would happen if your pumping system failed, for whatever reason, mechanically, power lines go down or whatever. I know you've got -- I'm not talking about what could happen.

I'm talking about you say there will be a plan for fish salvage in the event of prolonged shut down. So my question is: What does that mean in terms of -- what does salvaging

fish mean relative to the objective of maintaining the lake?

MR. JONES: Maybe I should put that in perspective of what's a prolonged shut down. We're a mining company. We run pumps. That's a big component of what we do, it's kind of a critical piece, we're good at that. And maintenance programs and ensuring that doesn't happen.

So the concept of prolonged pump failure, particularly on something like let's say recirculation, in my mind prolonged would be something that is -- where it becomes critical to the survival or whatever you are concerned about. And the only way that can happen is if you lose it -- if you lose a transmission line for weeks, we're not talking about a pump going down. This kind of system you would have an installed spare.

Is that -- put it in perspective?

MR. PEARSE: My question is: What the relevance fish salvage program? So what? Why are you salvaging fish?

MR. JONES: I agree. Why are we salvaging fish?

MR. PEARSE: You are proposing to do that, Mr. Jones.

CHAIRPERSON ROSS: Mr. Pearse, I'm trying to find where the reference to fish salvage is found and I can't seem to find it in the appendices you referred to. So could you be more specific to help us?

MR. PEARSE: Yes. I'm looking at the document prepared by -- prepared for Taseko on the front cover. It's called "Fish Lake Mitigation Flow." It's appendix 2724, B-D. And I believe I'm on the last page of that.

Section 6, "Risk And Associated Mitigation". So this is their proposed mitigation, as I understand it for the -- are you there?

MR. WHELAN: I think what that paragraph intends, this date, if there was in the rare event of a shut down the fish would be salvaged from the rechate (ph) from the tributary, and probably put back into the lake until the pump is repaired.

MR. PEARSE: I'll leave that one. It sounds a bit arcane to me.

CHAIRPERSON ROSS: Sorry, could

you identify yourself for the court reporter, please?

MR. WHELAN: I'm Mike Whelan.

CHAIRPERSON ROSS: Thank you. I knew you were introduced but I had forgotten your name. I apologize.

MR. PEARSE: Mr. Whelan, could you just stay there? I think my next question is probably for you too.

In that same section the concluding sentence there says:

> "It is expected with effective on-site monitoring and implementation of mitigation, et cetera, the risk of failure of the proposed flow augmentation plan will be reduced to an acceptable level."

I would like you to explain to the Panel what you mean by 'acceptable level'. I suppose that means the risk of failure to an acceptable level. Could you explain that, please?

MR. WHELAN: I didn't write that section, but I think "acceptable level" would be there would be no -- there would be backup

pumps sufficient to -- there would be no loss of water in the mitigation channels.

MR. PEARSE: Sorry, I thought you were the author of the paper. I wasn't really asking for your opinion if you were not the author of the paper. Who wrote the paper? Mr. Whitehouse, is it?

MR. WHITEHOUSE: Yes, Ryan Whitehouse. I wrote that paper, and by "acceptable level of risk" I was talking about the temperature and the dissolved oxygen concentrations in the creek that would be -- make sure that --

CHAIRPERSON ROSS: Mr. Whitehorse, could you get a little closer to the mic, please?

MR. WHITEHOUSE: Sure.

By "acceptable level" I was referring to I believe the temperatures and the dissolved oxygen concentrations, and the mitigation habitat could be maintained at levels suitable to maintain fish.

I wasn't speaking about the reliabilities of the pump. I was strictly speaking about the water that was being

circulated. And there was sufficient quality to maintain fish.

MR. PEARSE: Thank you, Mr. Whitehouse. I would ask either you or Mr. Whelan whether you -- either of you have had any experience with lake recirculation programs that are permanent and involve similar quantities of water?

MR. WHELAN: No.

MR. WHITEHOUSE: I have not, no.

MR. PEARSE: Are there any case studies or precedents that you could prefer the Panel to?

MR. WHITEHOUSE: Well, we have undertaken a literature review looking at the examples of recirculation. There are some examples of larger scale systems that are recirculated. There are ponds in parks in Victoria, like Beacon Hill park that are recirculated. There are other examples from lakes they are they recirculated water into spawning channels successfully to allow for fish to spawn in them.

MR. PEARSE: Nothing on this

scale as proposed, correct?

MR. WHITEHOUSE: I believe that this would be a little bit different and a little bit unique than those other projects, and perhaps not on the same scale.

MR. PEARSE: So it would be fair to say this would be an experimental unproven technology that's being proposed here. There's no track record, right?

MR. JONES: I think maybe it's important to recognize that pumping is not a new technology, Tony. I realize there's some complexities related to fish and health of fish and the rest of those things, but the mechanical component of this is pretty straightforward.

MR. PEARSE: Thank you. Could I then just talk back briefly to the mitigation flow report -- sorry, the water quality, Triton's water quality model report.

Did one of you write this? Did you write this report, Mr. Whitehouse?

MR. WHITEHOUSE: Yes, I was part of a team that prepared this.

MR. PEARSE: Say that again, you were part of it?

MR. WHITEHOUSE: I was part of a team that prepared this report.

MR. PEARSE: So this was a report prepared by several people?

MR. WHITEHOUSE: Yes.

MR. PEARSE: I noticed -- maybe I could take you to the inside the front cover of that report, and I would like you just to read the first two sentences under the disclaimer, please.

MR. JONES: Tony, are you talk about the disclaimer?

MR. PEARSE: Yes. If you just read the first two sentences of that disclaimer for the Panel that would be appreciated. Thank you.

MR. WHITEHOUSE: It's under the disclaimer.

> "The report is rendered solely for the use of Taseko Mines Limited in connection with the New Prosperity mine and no person may rely on it for any other purpose without Triton Environmental Consultants Limited's prior written approval. Should a third party use this report without Triton's

approval they may not rely upon it."

MR. PEARSE: Thank you. Maybe you would explain the relevance to the Panel and whether or not the Panel can rely on this report or whether they should maybe require -- get written approval from you to be able to do --

CHAIRPERSON ROSS: Mr. Pearse, I'm not sure this is terribly productive. Could we get to something that focuses on the environmental effects of the project?

MR. PEARSE: Mr. Chairman, actually I'm more or less at the end of my questioning. But I think it is very relevant because if you look at the other appendices and technical reports that have been submitted, and we just looked at one a minute ago by Triton, there's no such disclaimer.

In my view, this is a fairly strong statement that really says -- I think it says to the Panel, you can't depend on the information.

Now, I suspect the Panel will look at this material and go through it at any rate. But the long term implications is in the future anybody using this, what did this mean? I

think it's very serious because this is the key document now that is going to explain to you how -- what's going to happen with Fish Lake aquatic life.

We've seen it's been -- the whole is based on the SRK report, which I think you don't have any real coherent information in front of you about how they got all those graphical results, so there is sort of an empty box there. Now they are saying -- I think they are saying you can't depend on any of this information. So I think it's very important to get this clarified here. This is a critical piece of information, Mr. Chairman.

CHAIRPERSON ROSS: Any short, succinct response, please?

MR. JONES: This is standard language in work that is done by consultants for us. We see it all the time and Taseko is relying on this report, and it's in the public domain now.

MR. PEARSE: Mr. Chairman, just one question on this then I won't push it.

I would really like -- I think Triton wrote this. They didn't put it in the other documents. Why is it in this one? And I

think they need to explain that, Mr. Chairman.

CHAIRPERSON ROSS:

Mr. Whitehouse?

MR. WHITEHOUSE: I can't -- I don't have an answer for why this was included in this report and not the other reports. I will try to find out if there is a specific reason behind it. I will say, though, that the report was prepared by Triton Environmental Consultants and by qualified professionals to do so. And we do stand behind the work that we did in that record.

MR. PEARSE: Mr. Chairman, maybe it's a simple matter of Triton just writing -- giving the panel written approval to use it putting something on the record and we're done. Thank you.

I think we're done, Mr. Chairman.

CHAIRPERSON ROSS: Mr. LaPlante?

MR. LA PLANTE: Thank you, Mr. Chairman. Good morning.

Mr. Jones, I heard you say that pushing the tailings impoundment dam back two kilometres was absolutely critical. In my

understanding of what you said -- and correct me if I'm wrong -- but it that it's because it gave you the two-kilometre space in order to apply the mitigation measures that you are proposing. Is that a fair summary of the point you were making?

MR. JONES: It sounds fair.

MR. LA PLANTE: Thank you. I'm wondering, then, what's the plan for Wasp Lake and Big Onion Lake? And I'll note that Wasp Lake is only 500 metres away from the south embankment.

MR. JONES: Are you asking what is the plan for Wasp Lake with respect to monitoring?

MR. LA PLANTE: No. The mitigations. So if you're -- if there's a pump back mitigations being required for Fish Lake and you need two kilometres in order to make that effective, what about Wasp Lake, which is only 500 metres away? What about Big Onion Lake, which is affected by groundwater?

MR. JONES: Sorry, I don't mean to suggest that you have to have the two kilometres to do that. Tailings facility was moved as far away from Fish Lake as we could. It's still 500 metres from Wasp Lake and we've got

monitoring wells proposed there and, if required, they can become pump back wells (muffled) to protect Fish Lake. That's the plan.

MR. LA PLANTE: Is it fair to say, then, that by pushing the impoundment back two kilometres that you are elevating the risk to Wasp Lake and possibly Big Onion Lake, because there isn't that space?

MR. JONES: Increase in the risk to Wasp and Big Onion Lake relative to the proposed project in 2009. Is that the question?

MR. LA PLANTE: Relative to Fish Lake. So you don't have that space that you just said was critical to applying the mitigation measures to protect Fish Lake.

So I'm wondering -- and I don't think we've seen a discussion yet about the mitigation measures as applied to protecting Wasp Lake or Big Onion Lake. So I think it's really critical for Panel to get a sense of not just whether you've "saved" Fish Lake, but what about all the other water bodies? And I'll note that was Wasp Lake flows into Beece Creek and that's fishbearing, all fishbearing.

MR. JONES: I'm certain that

within the EIS the water quality predictions include those for Wasp Lake as well as Fish Lake.

So the information is provided in the EIS and the monitoring wells downstream to the south embankment were also there to ensure that. I don't know what else to say beyond that.

MR. LA PLANTE: I guess my point is, I'm curious if the -- can you apply the mitigations given that you don't have the space?

MR. JONES: Yes, we can. We have the space to do that.

MR. LA PLANTE: My final question is: If NRCan's model showing up to 11 times the amount of seepage, what would be your prediction of the impact on water quality in Fish Lake?

MR. JONES: Actually, I think we demonstrated that the NRCan model is not predicting 11 times more seepage than our model. They are actually -- our total numbers are pretty close.

MR. LA PLANTE: But you haven't assessed what the impacts to Fish Lake would be if their model turned out to be what actually happened?

MR. JONES: No, we haven't.

MR. LA PLANTE: Okay. Thank you.

MR. PEARSE: We're done, Mr. Chair. Thank you.

CHAIRPERSON ROSS: Thank you. I think at this point we'll take a break and we'll come back in 15 minutes.

--- Recessed at 10:50 p.m.

--- Resumed at 11:10 a.m.

CHAIRPERSON ROSS: Ladies and gentlemen, I think we are ready to start up again.

If I could have your attention. Before we continue with the questioning of Taseko, the Panel has a question that it would like to pose and Taseko has indicated again today about the comparison of seepage predictions that it makes and Natural Resources Canada has made.

The Panel has some residual confusion and we would like to try to seek some greater clarity on that.

With that in mind -- because we note that Dr. Desbarats is in the audience, we would like to ask him to provide any further assistance he can to the Panel regarding the

comparative predictions of seepage. Dr. Desbarats?

DR. DESBARATS: Thank you, Mr. Chairman.

NRCan's submission and my presentation make a factual comparison of the modelling results that I developed and Taseko's modelling results. So I believe the facts are there for you to assess.

Now, Taseko's comment that they believe that their modelling predictions are essentially equivalent to mine, I do not believe is correct.

CHAIRPERSON ROSS: Could you perhaps indicate what the differences would be that would help us better to understand?

DR. DESBARATS: Well, I think Taseko's position is really based on their 2-D modelling results, if I've understood correctly, where they -- for example, their total seepage rate through the base of the TSF is somewhat more -- well, maybe 60 percent of NRCan's base case value.

However, I did point out that they are 2-D modelling results did not include any

seepage into the deep groundwater zone, and that, in my model, amounts to a significant flux of about 1600 cubic metres per day.

So really their 2-D modelling -- it's difficult to compare the two because they had boundary conditions that precluded any flow to the deep groundwater zone.

But their number is within a factor of two of NRCan's number, NRCan's base case number.

CHAIRPERSON ROSS: Thank you. In that case, thank you for that. That's helpful. Thank you, sir.

We will move onto questioning by -- I guess the logical next step is any other First Nations interested parties, and any other organized -- no, let me rephrase that. Any other first party organizations. That's way wanted to say.

Oh, sorry?

MR. WILLIAMS: I think I qualify, Mr. Chairman.

CHAIRPERSON ROSS: Please step to a microphone, identify yourself and ask the question.

MR. WILLIAMS: My name is David Williams. I'm with Friends of Nemiah Valley.

It's just a couple of brief questions about the fish compensation plan. And I notice considerable discussion about re-engineering Elkin Creek, and that's of concern to me. You talk about creating berms and increasing flows at certain times. And I wonder to what extent you've studied Elkin Creek and the lower portions especially?

MR. JONES: I'll just ask Mike Whelan to speak to that.

MR. WHELAN: The Elkin Creek compensation plan was an idea put forward by the Ministry of Environment back in the mid-2000s. And what it speaks to, I, guess is in headwaters of Elkin Creek between Elkin Lake and the Nemiah Valley, there is a berm there and a flow diversion and a series of berms that aren't functioning as intended.

So during the freshet, the water that would normally report to Elkin Creek as part of the Elkin Creek drainage, most of the water that would report to Elkin Creek drainage, a lot of it goes into Nemiah Creek. And as a

result, there is not a lot of spawning flows in lower in Elkin Creek for (muffled) in chinook in particular, are not there.

So part of our compensation plan would be to, again, have a geotechnical assessment, hydrological assessment, and see if the berms can't be modernized or updated, fixed, so that they will keep all of Elkin Creek water within the Elkin Creek watershed, and keep the spawning habitat right at the mouth.

MR. WILLIAMS: So these are berms that have been manmade? So you don't know the effects it might be in the area that runs through the conservancy, for instance, through Elkin Valley, the Valhalla property?

CHAIRPERSON ROSS: Could you, A, turn on the mic and, B, get a little closer to it please. Mr. Whelan?

MR. WHELAN: No. The intent is to just restore baseline flows throughout the Elkin Creek watershed.

MR. WILLIAMS: Thank you. The other is -- I notice if you're talking about increasing fishing experience in a number of lakes in the Haines Creek area. Talk about the 11

Sisters, and particularly Slim Lake, which is accessed by a three-kilometre trail at present.

You talk about road building into some of these lakes, which changes the nature of the country. Part of the experience is that you actually have to access them on foot. So have you considered the effect that road building might have into these lakes and building camp sites?

MR. WHELAN: Yes, we discussed that when the 11 Sisters channel lakes came up again. That was a concept put forward by the Ministry of Environment at the time, and we asked about maintaining the wilderness status of those lakes. They are the ones that was the department that had -- that had set them aside as a wilderness lake, wilderness experience.

And they seemed okay at the time with this to -- it was actually one of their concepts they had brought forward was to improve access to 11 Sisters.

MR. WILLIAMS: I kind of take exception for the word "improved" but that's neither here nor there.

Are you aware that Slim Lake already has five, six-pound trout. I caught two

myself last winter and it already provides a superb fishing experience that enhancing isn't probably isn't necessary?

MR. WHELAN: I understand that, and also I understand that some of the trout from Fish Lake have already been collected from the Freshwater Fisheries Society, collected from Fish Lake incubated and grown out of the Clearwater Hatchery, and Slim Lake actually has received some Fish Lake progeny currently.

MR. WILLIAMS: Thank you. That's my questions.

CHAIRPERSON ROSS: Thank you, Mr. Williams. Organization? Go ahead, sir.

MR. HOLMES: Little bit late. Richard Holmes. I'm with the Tsilhqot'in National Government, First Nation Government, and I have a question for Greg Smyth.

In your adaptive management slide, Greg, I didn't see any sign of compensation on your graph after the mine was under way. I'm just curious to know why that wasn't put up there? A slide three, adaptive management.

MR. GREG SMYTH: Was that the slide showing the increasing frequency and

monitoring depending on what you see?

MR. HOLMES: I'm curious to know why compensation wasn't on that after the mine was opened. It wasn't slide three, but somewhere in Greg's presentation.

MR. GREG SMYTH: I think I know the slide you are talking to. It shows the graph, it shows the dots and it has across the top. The word "compensation" doesn't appear at the top.

MR. HOLMES: Not at all. Of course the graph tails off as if nothing could ever happen. Just curious to know why "compensation" wasn't on that slide, that's all.

MR. JONES: I think this will answer your question but....

The mitigation that's brought to bear -- don't tend to think of that as being part of compensation element, because compensation elements are already put forward as part of the project. So the mitigation is kind of in response to an unexpected change. Am I close?

MR. HOLMES: Kind of. I just want to press a little bit because I'm currently involved in a compensation plan in a mine similar to this. I just thought if there is a possibility

that something does go drastically wrong, I'm curious to know why compensation isn't identified as adaptive management.

MR. JONES: I don't see any reason why that couldn't be included in the concept, right?

MR. HOLMES: That's correct. I just want to make that paint.

MR. JONES: Thanks.

CHAIRPERSON ROSS: Thank you, Mr. Homes. Any other interested party organizations? Any interested party individuals?

Then I will move onto Panel -- yes, Panel questioning. My colleagues? George?

MR. KUPFER: Thank you.

The first one is a very simple question, and maybe because I read things differently. But on page 44 you use a picture designed for closure. And I'm just curious about your fish and fish habitat presentation.

Is that particular image to scale? Is that from another source or? The reason I wondered, some of the distances don't quite look like they fit. That may just be my misunderstanding of how to read that diagram.

Page 44. You used it somewhere else as well.

That's it.

MR. JONES: Yes, that would be pretty close to scale. That would be based on Google image that the components superimposed on it and then kind of an artist's rendition.

MR. KUPFER: How close the artist was following scale. Okay, thank you. Then I have one other question.

If there was a serious deterioration in water quality and water treatment was required, what's involved in terms of a timeline for responding?

MR. YELLAND: My name is Greg Yelland, chief engineer of Taseko Mines.

Two scenarios around if the water quality did start trending towards water quality guidelines.

We looked at if it reaches 50 percent of the guidelines we then would start looking at increasing monitoring. If it reaches 65 percent then we would look into, okay, how are we going to actually mitigate this, what kind of water quality plant would we put in place. And we would actually put in water treatment before we

reach 75 percent of the guidelines.

We would be looking at the acceleration of the concentrations, and if we saw that the concentrations were going to reach 75 percent within let's say a year, then we would be putting mitigation in right away, say we need to get it into right away.

But what we have said is, if we saw that the acceleration of the concentrations was at a rate that allowed four years, then we would be able to say, okay, we've got enough time to really examine what's happening out there, design a purpose-built mitigation plan and apply it before we reach 75 percent.

So we used four years as a example. Again, that is an adaptive management plan that we have thrown out as a concept. If we do go to permitting, we definitely would have to take a look at those adaptive management plans in consultation with regulators and First Nations. We would probably change the adaptive management plans to be something that met everybody's requirements.

MR. KUPFER: This is a follow-up. Is there a minimum of amount of time?

Is a year sufficient, six months is sufficient?

MR. YELLAND: It would depend on the rate of increase of the concentrations that we were monitoring.

MR. KUPFER: But if we assume -- let's say it's a serious rise in negative information. How quickly -- what's sort of the minimum time you might need to respond to an emerging, if it was serious?

MR. YELLAND: We received information from a couple of suppliers saying that they could get mobile plans into place within five weeks.

MR. KUPFER: And would you require more than -- I guess you can't answer that. If there were more than one location required, I guess that would all be determined at that time?

MR. YELLAND: More than one location for?

MR. KUPFER: More than one issue, I guess is what I'm saying. It's a layman's question.

MR. YELLAND: No problem. I think a lot of these water mitigation plants or

water treatment plants will mitigate against different types of metals at the same time. But we would definitely be looking at let's say sulphate increase, we would able to get something in place fairly quickly to mitigate against that. That would be a separate module within one plant.

MR. KUPFER: Thank you.

MR. SMYTH: In the water quality presentation you discuss segregation of materials, and I want to focus in on the open pit area.

In the open pit area there are $72 million tons of overburden, 12 million tons, or 17 percent that have is deemed to be PAG -- the material that sit on the ore body and some of the basalts. And that leaves you 64 million tons for construction purposes.

Is there a plan when you is strip the pit to segregate that material is this?

MR. GREG SMYTH: Yeah. Greg Smyth here.

There would be a detailed segregation plan for all the materials that need to be transported in one location or another, or used in one location or another.

In the case of the overburden we're referring to, one of the key aspects of the non-PAG overburden really is for construction of the core of the dam, and it would be used as augmentation in the basin as well. So the short answer is yes. Segregation of the overburden materials is part of the plan.

MR. SMYTH: Have you calculated how much of that 60 million tons of material is suitable for use in the core of the foundations?

MR. GREG SMYTH: I don't think we've ever done a detailed analysis of the volume of that that would be suitable in the documentation.

MR. SMYTH: It goes to -- is there enough material and, if there isn't, then you'll have to open up bore pits elsewhere in the region. That's why I'm asking the question.

MR. GREG SMYTH: Fair question. I think the magnitude of the difference between the core volumes and the available non-PAG overburden availability is quite different.

I would have to check to actually give you the numbers. I know that the material balance has been actually derived through

the various reports within the EIS. I know we've got those tables actually in there.

But -- so the expectation is that obviously a large portion of that is going to be suitable for actual compaction within the core of the embankment because the core is -- it's metres wide, sort of thing, eight or 10 metres, in that range, on so it's not a large volume. The majority is obviously the shell, so it's a small over all comparison. But I'll get you the number. I think it's important to you know it.

MR. SMYTH: When I look -- I thought I saw 25 metres for the -- is that the core or what is the 25 metres? When I look at the embankments there was a line on top saying "25 metres", and then material coming out of the side which presumably is....

MR. GREG SMYTH: I'm get you the right number for the crest that so I can answer your question properly.

MR. SMYTH: Thank you.

CHAIRPERSON ROSS: The Secretariat makes me say "undertaking" whenever I hear that, so I'll treat it as such.

Let me continue on a question

that George started in some fashion.

You talked about using the relevant water quality objectives as a guide in your adaptive management. And that leads me to the question of your determination of significance.

Why would you not determine a significant adverse effect to be one that exceeds water quality objectives?

MR. GUSTAFSON: If I may, Mr. Chairman, there's a number of responses to that, but I think it's important that the Panel understand that the water quality guidelines are themselves just that, they are guidelines. They are not of any particular legislated effect.

It's because water quality varies naturally area to area. So in the permitting process what the Ministry looks at are site-specific water quality requirements, which may be more or less than the guidelines call for.

So the guidelines are kind of a rule of them. If you are not going to exceed them then the assumption is that you don't need to worry about them.

But the Ministry actually has

150-page-odd policy document called the B.C. Ministry of Environment Methods for Deriving Site Specific Water Quality Objectives in British Columbia, updated in April of this year.

It's to that document that the parties will refer when they reach the permitting stage, and specific water quality objectives and criteria will be installed in the permit.

CHAIRPERSON ROSS: Will those site-specific water quality objectives be determined by the government of the British Columbia then?

MR. GUSTAFSON: Yes. The Ministry of the Environment in conjunction with the -- in relation to the issuance I believe of the Mines Act permit. And if it isn't that permit that would contain the specific requirements, it would be the permit under the Environmental Management Act. I'm not sure which of those two permits would contain those requirements.

CHAIRPERSON ROSS: That's helpful. I'm not sure it answers the question, but it certainly is very helpful, and I thank you for that. I'm going to move on then.

Linked to that, now I

understand what targets you will be using for the adaptive management response. I guess the question I have is: With a five-week lead time for putting in some form of water treatment, are there any water quality variables that could provide an early warning indicator that is not early enough? The one that may jump to mind would be declining dissolved oxygen under ice or some circumstance like that, where the change may in fact be quite quick.

Now, I'm not suggesting a water treatment plant deals with low dissolved oxygen. I guess I'm trying to be reassured that there is no circumstance where the monitoring and evaluation would be done in such a time as to fail to provide an early enough warning that the adaptation could can be put in place. And that would also lead to -- well, let me stop there and I'll lead to my next question after I hear the answer.

MR. WHITEHOUSE: I would agree with you that dissolved oxygen can be reduced rapidly in a lake and it's also under ice which makes it a little more difficult, a little less in the eye, so you really can't visualize it very

well.

Perhaps there is a realistic need to address the problem before we see a problem with dissolved oxygen. I think it could be a very valuable tool to install prior to construction myself, and I also think that it would help improve water quality of Fish Lake before the mine actually is developed. Does that answer your question?

CHAIRPERSON ROSS: Sorry, I'm trying to follow your response here, but it keeps jumping when I talk. You say that would be a valuable tool to install. What would be a valuable tool to install?

MR. WHITEHOUSE: I'm sorry. Some sort of mechanism to deal with hypolimnetic oxygen depletion. Something like a hypolimnetic oxygenation system which are in common practice around B.C., and they're effective, and they have been shown to be effective for dealing for just that problem.

The other reason why I think it might be valuable to have in advance is Fish Lake has already exhibited signs in the natural conditions of being a lake that can be susceptible

to under ice oxygen depletion and potentially winter kill of fish.

CHAIRPERSON ROSS: That leads to my next question which is pretty much: How frequently would you measure dissolved oxygen under ice in Fish Lake, for example? Because if you don't know what it is, you can't adapt and respond.

MR. WHITEHOUSE: Well, the timing of sampling is something that is under full control of Taseko. If there is any indication -- as there is indication. We've seen indication that the lake exhibits under ice depletion. I believe the -- a solid monitoring program would probably be on the order of -- it's tough to say.

If you saw a problem you would obviously increase amounts. The timing of the winter, during the winter is important, too, because oxygen depletion reaches its maximum depletion for winter kill towards the end of the winter after the oxygen has had a chance to be used up by the microbes in the sediment.

So I think towards the end of the winter, certainly past January, February, I would say that you probably would want to increase

the rate of sampling for dissolved oxygen. All of these specifics can be ironed out after -- as a part of the whole ironing out of the adaptive management plan for Fish Lake.

CHAIRPERSON ROSS: I guess I'm anxious that something that could be very important is so loosely defined right now, and so I'm going to push on it, if I might.

Not only for dissolved oxygen under ice, which is sometimes tricky and there are some safety issues about making the measurements, one certainly doesn't want to compromise safety. But one also doesn't want to compromise the ability of an adaptive management plan to respond to concerns.

What would be a normal frequency for water quality monitoring more generally? I thought I heard, Mr. Jones, you indicate perhaps quarterly but -- I may have read too much into between the lines. Frequency of monitoring is the general area I would like to understand.

Mr. McManus?

MR. MCMANUS: Yes, it's an operational question that you are asking and I'm

operations, so I'll attempt to answer.

The adaptive management plan chart that Greg put up didn't have a timeline at the bottom. Well, it had a timeline but it was undefined. So those parameters, which may happen more quickly, would be determined. The monitoring program for that would be developed based on the repeatity of the perhaps change that would happen. Up to and continuing the continuous monitoring. There are devices which you can put in -- depending on what you need to know. For instance, at the mine site we have tailings flow -- continuous monitoring of pressures on pipes because a broken pipe can cause a change very quickly.

So it's not just water treatment, it's what is the mitigation you have to put in place based on what the occurrence is that's causing the problem.

So things can change very quickly or monitored very closely up to and including continuously. Something which may or may not happen quickly would be monitored at a lower frequency.

If that's any help to your

question. There's not a single answer to your question.

CHAIRPERSON ROSS: Thank you. Some of the fish enhancement -- I'm changing subjects here in case you didn't catch on.

Some of the fish enhancement schemes that you showed us looked -- this may sound denigrating but my purpose is just to ask a question -- look pretty temporary. They look like the first storm. I live in Calgary so I'm very familiar with big storms coming every now and then.

It looked like a storm event would wash out some of the mitigation measures. So I'm just looking for some information about how those habitat enhancement measures would be effective over the longer term, what size of a storm would render them less than useful?

MR. JONES: Just any one of them in particular, or just in general?

CHAIRPERSON ROSS: Once where you put logs on top of things, high water carries logs downstream. So, for example, things where you had boulders at the side of the river, a serious high flow would move them around and

re-distribute them. Just off the top of my head.

MR. YELLAND: The ones with the habitat compensation you refer to, that was the Taseko Lake off channel where they intend to develop upwards to six kilometres of off channel habitat. Those are the ones with the logs. The logs can be secured and anchored. There's various methods, guide books, provincial guide books that deal with how to secure a dead (muffled) logs in the water.

But the main thing for the flow for these off channel habitats using groundwater, essentially. So it's not subject to the high seasonal fluctuations like you would see with surface water in a river, in a steep gradient stream without a lake, for example.

So the water level in these groundwater fed channels, they rise a lot more slowly than the surface water does.

And as far as the other -- some of the berms we're talking about earlier on, on Haines Creek and Elkin Creek, that's the trouble with them right now is that they were built back in the forties and the berms weren't keyed in and that's why we're getting all this loss of water,

the seepage. So those would be designed by a geotechnical engineer and they would have to be keyed into the bottom to prevent the loss of water.

CHAIRPERSON ROSS: Thank you. That helps.

Yesterday -- I guess Saturday Dr. Morin raised questions about the concentrations of metals in pour water, citing some examples where the concentrations would be substantially higher than were estimated by you folks.

Can you help me to understand what kind of concentrations have been found? And perhaps the answer may be related to an earlier undertaking to provide similar information from Gibraltar, in which case I'm happy to wait for that that.

I see Mr. Gustafson nodding his head. So I'm taking that as a 'go away, ask your next question and move on.' In which case, thank you for my answer.

During operation and perhaps for sometime after that, the suggestion is that the fish habitat in Fish Creek upstream from Fish

Lake would be enhanced by larger flows.

I'm trying to figure out how these larger flows would be maintained after closure, assuming is everything goes smoothly and you are able to stop pumping. Would the flows then return more or less to the current flows, in which case, how would the enhances fish habitat persist?

MR. GREG SMYTH: Greg Smyth here.

So in identifying with the flow of augmentation would need to be in the inlets of the lake, both in the main stem as well as in the tributary one. An evaluation was done of what would be the ideal flow, and it's obviously different than what exists today because the spawning habitat in the outlet is lost so the inlets want -- has to do the job. Therefore, flows have to be different, and so the first step was to define what those flows are.

That sort of defined the recirculation volumes and timing and all that stuff during operations, as well as in some of the closure phases that were stipulated throughout out the EIS.

We kind've broken it into ten-year time frames to put some brackets. Then upon closure, full closure essentially, when the tailings facility is really in a point where there is going to be surface flows leaving the facility, the quality is suitable to release and that sort of thing. That would define the volume of flow, that would essentially move to those spawning channels, the two inlets.

The numbers that we looked at are at the upstream catchment, as is the case now. If we were to change the flow augmentation isn't enough to meet those design criteria that we're looking at in operations.

We're actually looking at putting much more flow than the catchment generates and flows into there right now. If you follow my thread, maybe not.

CHAIRPERSON ROSS: I'm sorry. Let's assume for the time being that everything goes tikity-boo and at sometime you walk away. After that, how is it that there is more flow in tributary one and the Upper Fish Creek where the spawning habitat would be than there is now?

MR. GREG SMYTH: I'm going to

see if Scott actually has this, but I believe there's an expectation for recirculation in the longer term.

MR. JONES: I'm going to try to answer that question.

So your question was -- just correct me if I'm wrong was -- assuming everything works according to the plan and Taseko was able to walk away, what would maintain those additional flows? It would have to be a pump to maintain those flows. I think that's the short answer.

CHAIRPERSON ROSS: Thank you. I have no questions at this time. If you give me a moment.

At this point Environment Canada is next and I think what we would like, if Environment Canada is okay, is for it to proceed, we'll run a little late, and at the end of its presentation we'll have a break for lunch and then return for questions.

Is that suitable for Environment Canada? Okay. Let's do that then.

MR. JONES: Mr. Chairperson? Would it be okay with the Panel if we had an undertaking related to the quantity of till

available for when in the pit to be used in the embankments. We could address that right now, if you like.

CHAIRPERSON ROSS: You could do it succinctly, I take it. Yes, please go right ahead.

MR. GREG SMYTH: So the crest the till core is specified at 20 metres. So 20 metres width is what's in the design documents.

The second question was about the volume of till. So I think you used the number of 60 million tons. We had cut that by a third, assume 30 percent is unsuitable, so that leaves a balance.

And then in the 40, 42 million range I think, tons. And then we need a little less than 20 million ton for the core of all three embankments. So there's kind of twice as much as we what need once we dismiss that third for unsuitable. That was the basis of the calculations.

CHAIRPERSON ROSS: Thank you. Environment Canada?

I understand we need to make some adaptations of the hardware around here as

well.

(DISCUSSION OFF THE RECORD)

CHAIRPERSON ROSS: Whenever you are ready. Go ahead.

MR. WRIGHT: Good morning, Mr. Chairman, members of the Panel, elders, chiefs, ladies and gentlemen.

My name is Steven Wright, spelled S-T-E-V-E-N, W-R-I-G-H-T. I'm the regional director for Environment Canada in the Pacific and Yukon region, and will be providing some context for Environment Canada's participation in the Federal Panel -- in this Federal Panel process.

Firstly, Environment Canada's team would like to thank the City of Williams Lake, and the people within whom whose traditional territory we are in today.

EC is participating as a federal authority and a Federal Review Panel, Panel's assessment of the New Prosperity project providing specialist and expert information and knowledge under section 20 of the Canadian Environmental Assessment Act 2012.

Also, EC may have a regulatory

role for the project as an amendment to the metal mining effluent regulations enacted under the Fisheries Act may be required.

Environment Canada's final submission and our presentation are in response to the Panel's June the 21st, 2013 request to present EC's technical review of potential environmental effects of the project and to provide information and recommendations as they relate to the department's expertise and mandate.

EC has provided expertise for this review in the areas of water quantity, water quality, climate change, wildlife and alternative assessments.

For today's session, EC experts will be addressing water quality, water quantity and climate change. I would like now to introduce Environment Canada's team who will be participating in today's hearings.

On my left is Mr. Phil Wong, who is a senior environmental assessment officer for this project. To my immediate right is Mr. Mike Hagen, who will be presenting on surface water quality.

Ms. Manon Lalonde, who is

unable to be here in person but is on the phone, will present on surface water quantity, specifically in the areas of water balance assessment.

Finally, on my extreme right is Dr. Emma Watson, who will be presenting on the subject of climate change.

And with that, I will turn it over to Mr. Michael Hagen will make a presentation on water quality.

PRESENTATION BY MICHAEL HAGEN:

MR. HAGEN: Good morning, Mr. Chairman, members of the Panel, elders, chiefs, ladies and gentlemen.

My name is Mike Hagen, spelled M-I-K-E, H-A-G-E-N. I would like to thank you for the loan of the realtime transcripting output, much appreciated.

I'm a senior program scientist at Environment Canada, specializing in water quality and aquatic effects monitoring. I will be speaking to you today about the potential effects of the proposed project on water quality, specifically highlighting uncertainties and risks that we have identified and how these

considerations inform our conclusions regarding potential effects.

General comments about how we approach this. Environment Canada possesses expertise regarding water quality effects of potential development and we are asked to provide advice in that area during the EA process.

During the EA process we look at the magnitudes, the extent and duration of potential project impacts that may affect the use of (muffled) the potential for adverse effects.

The way we do this is can be a fairly straightforward approach.

First, we would scrutinize baseline data quality. Fact (muffled) the natural variability, sampling variability, potential for analytical errors may accept the use of baseline data in data -- in water quality modelling and, therefore, the confidence that we have in the conditions that were made. Same for inputs.

Input to data quality modelling may be variable, so we will scrutinize water quality modelling assumptions and put terms. We'll ask: Are there discrepancies? Are there oversights? Are there alternate interpretations?

Are proposed mitigation and management practices likely to be successful? Are assumptions reasonable? And when considering output I very, very much rely on the opinions of other experts to get their advice about the inputs to the model.

Next. Recognizing that in general terms modelling tends to be conservative. At the start we can take predictions at face value and ask if there are potential for significant or for adverse effects on that basis. We do that by comparing to guidelines such as the Canadian Council of Minister of Environment, Canadian Environmental Quality guidelines, other guidelines such as B.C. Ministry Of Environment Water Quality Criteria, and also based on our experience at other sites.

A key part of this process is to identify uncertainties to determine what level of confidence we have. And in end, keeping in mind the magnitude, duration and extent of the potential impacts, we can advise whether an adverse effect is likely, not likely, or in some cases, we advised that we do not have sufficient information to come to a conclusion.

I just want to re-visit the

previous summary conclusion of the Panel from 2010. In the previous review, we did not have Fish Lake, so our attention was on Lower Fish Creek and the Taseko River.

The proponent at that time made commitment to ensure that the water quality downstream of the pit area by using the good management practices that many agencies promote. At that time it seemed reasonable and achievable.

Hence, our conclusion that no significant deleterious (ph) effects on water quality were expected if the Proponent follows the good management and water management practices. Good way to manage (muffled) identified.

Now, with respect to lower Fish Creek and, to a lesser extent, the Taseko River, we hold to that previous conclusion.

The Proponent once again commitments to water treatment at the outlet of the Pit Lake, if necessary. Environment Canada is of the view treatment will almost certainly be needed and needed indefinitely.

Still, the Proponent's making that commitment and they are able to achieve it -- seems reasonable that there should not be

significant adverse deleterious effect on water quality downstream of the pit area, with some caveats.

The main caveat there would be the question about seepage that has been discussed recently. For example, the seepage greater than the estimated, then contaminant loading could be higher and that could affect the magnitude of effects in the Taseko River, could be a little uncertain whether Taseko could, in fact, achieve their objective.

But now the New Prosperity Fish Lake part of the project, we presume that there is no point preserving Fish Lake water quality is not also preserved.

Given some inconsistencies in this EIS, some uncertainty regarding seepage from the tailings storage facility, the unproven nature of some of the water recirculation and some of the treated -- proposed treatment methods we are unable to draw conclusions about the Proponent's ability to maintain good water quality in Fish Lake.

And now I'll explain a little bit how we came to that.

Focusing on Fish Lake lake now. Clearly Fish Lake is a focus of this environmental assessment. Fish Lake was not assessed in the same way by presenting the same discussion technical depth as with the area lakes. Appendix 2.7.2.1-I only presents results in chart form.

The EIS itself discusses the background, but that discussion is incomplete. In the appendix, those charts do not present some substances of parameters. For example, hardness, pH, temperature, nitrite. Those are all of interest to Environment Canada.

Still, let's take those results predictions at face value. Many parameters are predicted to be under guidelines -- increased from baseline, but some are apt (ph) or inferior to guideline level, such as aluminum, silver, copper.

And some are predicted to exceed guideline levels, cadmium, iron, phosphorus, selenium.

Our concern at this point is there may be additive or synergistic effects from these levels, multiple levels, being close to guidelines. The margin for error is a little bit less, if we have a number of parameters that are

close to guidelines.

We also note that both sodium and chloride increase. There is a CCME water quality guidelines for selenity which is a 10 percent increase over baseline, and that appears to be exceeded.

Based on the predictions, we conclude that prediction levels are marginal for good water quality. They are likely to lead to changes in the aquatic community which may or may not be adverse.

One know other factor that we see here is that mercury is predicted to decrease, and this is interesting and somewhat unexpected. In our experience, land clearing and run off disturbance in general tends to increase total mercury in receiving waters that are disturbed.

We also find that an increase hydraulic resonance tying (ph) the lake, which the Proponent is predicting will happen, increase sedimentation that is associated with that. Increase the productivity as the Proponent predicts eutrophication and treat biological productivity in the lake. Mercury methylation becomes more likely.

This may have an implication of fish and Fish Lake are larger, possibly older, as appears to be suggested in the environmental impact statement. The question becomes whether there is going to be more methyl mercury accumulation.

The EIS did not discuss possible changes to total mercury and methyl mercury ratios deriving from altered methylation potential or to potential changes in fish population.

While this is not (muffled) by Environment Canada's area of expertise, we are concerned about the potential for human health effects may be insufficiently addressed.

We're aware that Health Canada is interested in methyl mercury from a food perspective and perhaps they will be speaking to this issue. But from Environment Canada's perspective, although decreasing -- well, decreasing mercury is somewhat contrary to our experience and it suggests some uncertainty in the water quality modelling.

Another factor that we look at, one of the reasons why the predictions may be

somewhat uncertain, is the seepage issue that has been discussed.

From our perspective, or from my perspective directly, inputs to water quality models have set confidence in outputs. Seepage from the tailings storage facility is greater than estimated, that could affect the concentrations and the predictions that are being made. It could more marginal than predicted. It could mean more aggressive management is needed. And that could mean more uncertainty whether those method could be successful.

So we see an increased uncertainty in a higher level of intervention. Greater uncertainty and also seepage is not conservative. It raises questions about other inputs to the water quality model, and (muffled) that overall confidence in the predictions that are being made.

I'll be addressing lake circulation and water treatment in the next two slides.

Now, in terms of lake circulation measured by the Proponent. The Proponent found few of any examples of successful

application of lake recirculation as they proposed. Environment Canada conducted literature search and found considerable information about recirculating aquatic systems which may provide some insight into the general success of lake recirculation. We do not have much expertise in this area and defer to other agencies which we know have submitted a more detailed report, but we can make some general comments.

In general, in a recirculating aquatic system nutrients and other contaminants tend to accumulate. We see this in the water quality predictions that are made, in particular phosphorus and nitrate are predicted to increase. Also the Proponent discusses the need for nutrient management.

We also see the increasing levels of sodium and chloride and suggesting selenity increases which would be expected in a recirculating system.

So from our perspective, Environment Canada is concerned that high levels of management at ever increasing levels of complexity also increase uncertainty and risk.

Regarding the treatment

options. Again, other agencies have commented on the Proponent treatment options. We do not have a great deal of expertise in technological development management options, but in our experience increasing levels of management intervention also increase levels of uncertainty regarding whether the actions will be effective and behave as expected. Ecosystems are complex. Complex intervention is risky.

The Proponent proposes a high level of reactive management into adaptive management plan and includes many options that are relatively untried or unproven that the scale proposed.

Other agencies commented on the uncertainty of achieving better (ph) results.

In our view, while the Proponent may be able to achieve satisfactory water quality using this method, it would be at a high level of uncertainty about effort, cost and risk.

Now, I'll make some comments about the other lakes in the area, and some of the comments I make about these other lakes also pertain to Fish Lake.

Little Onion Lake. Baseline on the water quality is good, reflective, a productive lake. The Proponent predicts essentially no changes to water quality in Little Onion Lake.

We note, however, that Little Onion Lake is upstream of Big Onion Lake and only about 1500 metres downstream of the tailings storage facility. The Proponent asserts that tailings storage facility pour water does not contribute to groundwater base flow into Little Onion Lake. We question this assertion, does seem probable based on our experience at other sites and reduces our confidence of the water quality predictions made by the Proponent.

Big Onion Lake is similar to Little Onion Lake in the initial water quality reflect the productive lake. After operation there's very little change, although some parameters are elevated. In contrast to little Onion Lake, TSF seepage it predicted, although there are inconsistencies in the EIS and the appendix that describes this.

I would like to highlight the risk of selenium effects at this point.

With respect to selenium, there is a small range between the central nature of selenium and the toxic level which could only be a little bit higher. Small range there. At higher levels, selenium may cause reproductive failure in pregnant or (muffled) at critical life stages. There seems to be a poor correlation between water concentration and tissue residue levels which cause effects. In other words, water concentration would be a poor indicator of potential effects.

The key point we want to make here, though, is that in our experience selenium concentrations have been increasing at other sites with little demonstrative ability of operating at those sites to control the trend (ph).

First, the long term success of treatment options have yet to be determined. Though, again, we conclude -- we see a high uncertainty regarding selenium, and then for other subjects that are little bit better understood.

Wasp Lake is not strictly speaking in the Fish Lake watershed. It's in the Beece Creek watershed. So it shows that this could be some effects of the mine project out of

the Fish Lake watershed.

Baseline water quality in Wasp Lake is good, reflects productive lake. The Proponent predicts essentially no change in water quality and -- that's not true. I went back in my slides instead of forward. I apologize. Wasp Lake is up there.

At closure, peak conditions in Wasp Lake, hardness has increased from 100 to about 1,000 milligrams per litre. Phosphate (ph) predicted to increased from one to about 1,000 milligrams per litre. Nutrients predicted to increase by about 10 percent, except for ortho phosphate, which would be a bioavailable form of phosphate predicted to increase about a thousand times suggesting eutrophication is likely.

Aluminum, arsenic, cadmium, copper, iron, mercury, selenium, silver, all exceeding guidelines by 5 to 10 times or more.

Aquatic community changes likely; possibly adverse in a situation like this.

We also note a number discrepancies between the EIS and the appendices that reduce confidence in predictions. The seepage discrepancies that were noted reduce our

confidence in predictions.

Low confidence means high uncertainty, means more risk. But in this case, Wasp Lake is non-fishbearing. It is only a small part of the Beece Creek watershed. Perhaps in this case the level is acceptable.

Next slide. Last slide. In Environment Canada's view, we note that the Proponent predicts Fish Lake will experience eutrophication and contamination as the project proceeds.

The Proponent asserts that active management will preserve the value of Fish Lake. Environment Canada notes that these practices are unproven as that scale proposed. Additional intervention may be needed to ensure preservation of water quality in Fish Lake.

Given the degree of uncertainty, Environment Canada is unable to draw any conclusions regarding the likelihood or magnitude of the effects of the project on water quality.

Thank you for your attention.

CHAIRPERSON ROSS: Thank you, Mr. Hagen. Do you wish to proceed with the next

phase of your presentation?

MR. WRIGHT: Mr. Chairman, we have two more presentations to go. Would you prefer we do the three, or do you want to take questions and then....

CHAIRPERSON ROSS: If this is a suitable time, perhaps a break for lunch would be in order.

MR. WRIGHT: I think the next two presentations complement each other, so perhaps now might be useful.

CHAIRPERSON ROSS: That sounds fine. Why don't we reconvene at 1:15. Better yet, we will reconvene at 1:15.

--- Recessed at 12:20 p.m.

--- Upon resuming at 1:15 p.m.

CHAIRPERSON ROSS: Good afternoon, ladies and gentleman. Just before we return I have an important announcement to make. The word "important" was inserted by me in humour. On our right we have a bottle of water now available. If you have your own cup especially you're welcome to use it. If you don't have your own cup, we do provide some paper cups, and the idea is to reduce the use of plastic bottles.

Of more substance, the plan is Environment Canada is to first question Mr. Hagen and then we have the other two presentations which we understand are somewhat linked.

So at this point I would turn to other Government of Canada folks who might have questions for Mr. Hagen and Environment Canada. Seeing none, I will move on to First Nations interested parties who might have questions. If you do have questions for Environment Canada -- Mr. Pearse.

QUESTIONS BY MR. PEARSE:

MR. PEARSE: Thank you. I'd first like to thank Mr. Hagen for this portion and all Environment Canada for their written submissions. I think most of my questions are for Mr. Hagen. I will try and weed those ones out if I stray. I'm sure somebody will let me know. The first question I have for you is: As a water quality scientist do you believe having multiple stressors would result in increased impacts? I know you talked about the synergistic effects in your report but I'd just like you to kind of clarify that, if you would.

MR. HAGEN: The question is

regarding multiple stressors in the system, I'm presuming you mean if these stressors are all at guidelines level or near guideline levels, so multiple stressor.

In a case like that we could have synergistic or additive or even antagonistic effects operating. In general terms, additive effects are where the effects of each parameter or substance would be added together.

A synergistic effect would be when the combination of the substances is greater than the whole so-to-speak. And antagonistic is when the concentration of the substance is interfering with the higher concentration of another substance, so the total effect is lower than if separately.

In general terms, looking at a specific combination of substances in a specific area would be very difficult to say what might happen and, in fact, that's one reason why we're quite concerned about a situation like that. We would do a site specific water effects or aquatic bioassay approach to see what effect mixtures have.

So that would be the

recommendation that we would in a case like that. If we have a mixture of a number of substances that are at guidelines and it's a concern, you do a specific bioassay approach to try to find out what the effect of those mixtures would be.

MR. PEARSE: Thank you. At several places throughout your presentation this morning you talked about not having enough information which led to uncertainties about what you could conclude, I think, if I understood you correctly.

And on page 5 of your submission there's particular reference to the details of the water quality model for Fish Lake concentrations, and that's an issue that we have raised before. We are in the same boat. So I wanted to ask you: On the basis of that, were you able to assure yourself that the SRK water quality modelling for Fish Lake had sufficient information to say, to validate it basically, or were you left in a position of just not being able to do that?

MR. HAGEN: Slide 5 is --

MR. PEARSE: The code was details could not be located. That's what you're looking for.

MR. HAGEN: One moment, while we take a look at the slide in question.

Mr. Pearse, do you not mean slide 4, which is the slide that directly addresses Fish Lake water quality?

MR. PEARSE: It may be there. I was looking at the written report, page 5. It's right at the bottom of page 5 you say that those details could not be located.

MR. HAGEN: Okay. What Mr. Pearse appears to be referring to is the lack of documentation in appendix it 2.7.3.1(i), which I referred to in my presentation. That appendix just shows the results of water quality modelling in figure form in charts. There are no tables and there's very little description of how the model was actually derived. I believe the Proponent put a summary of that into the EIS but we found it to be a bit incomplete.

So to respond to Mr. Pearse's question whether we found it adequate to come to a judgment, no we didn't.

MR. PEARSE: I think you're saying what I asked. What I was looking for was I really wanted to know whether you were able to

evaluate the model, and that may be the same thing, I'm not sure, but if it's not, if you could answer that question, I'd appreciate it. Thank you.

MR. HAGEN: Okay. I understand. It's a bit difficult to approach it in those terms. We do not have a great deal of experience in actually creating a water quality model. We tend to take these things at face value, but we can - and do try - to appreciate the uncertainty that go into the inputs, and recognize the uncertainty that may be coming out of the model, and I believe we've done that. I indicated that there were some uncertainties.

MR. PEARSE: Maybe this will help a bit. I assume you looked at the Knight Piesold model for the other areas around Fish Lake?

MR. HAGEN: We did.

MR. PEARSE: You found sufficient information in that model, in terms of a model report and so on, that enabled you to evaluate the model, look at the assumptions, the input parameters and say that's a good model or whatever, right?

MR. HAGEN: Yes, the information that was provided in the Knight Piesold appendix was such is that we have more confidence in the model prediction.

MR. PEARSE: Given the uncertainty around your assessment or what you found about the SRK model for Fish Lake, where does that take you when you look at the Tritan model that takes that information that model outputs and tries to predict impact to the aquatic life in Fish Lake?

What is your level of certainty about how good and reliable the Tritan study is?

MR. HAGEN: I'm sorry, Mr. Pearse, could you repeat that, please? It didn't come up on the transcript.

MR. PEARSE: Model number 2, the Tritan model, as I understand it, takes the outputs from the SRK model with the water concentration and puts that in another model to take about biological effects? Do I have that right?

MR. WRIGHT: Mr. Chairman, we're having trouble here. Can we have a moment to try and fix it?

CHAIRPERSON ROSS: Certainly. Let's try to fix it if we can.

MR. PEARSE: That model takes the SRK water quality results and uses those as input to that Tritan model, as I understand. Is that correct?

MR. HAGEN: I'm not sure on that point.

MR. PEARSE: Maybe we could get a quick confirmation from Tritan, because I want to finish this off.

CHAIRPERSON ROSS: Why don't you proceed with the next question, which seems more important.

MR. PEARSE: Okay. So, Mr. Hagen, what I'm asking is you've expressed some significant uncertainty about the SRK model because you didn't see all the data and discussion, and my understanding is that the Tritan model is based on the SRK.

So if you don't have good assurance on that what would you say about your confidence in the Tritan model, which really talks about the effects of biological life in Fish Lake, which is, I think, the critical piece?

MR. HAGEN: You are getting to one of the crux issues here, if we have uncertainty we don't have confidence in projections made and until we can address that and come to a consensus about what's happening in the model, then our confidence is not high enough to make a lot of judgment about what is happening.

MR. PEARSE: That's for Tritan as well as the others? If we can look at page 15 of the written submission -- page 10 of the written submission.

I just wondered, you note that there are some exceptions in the trends of various parameters and water quality looking at the graph that you got on page 10, some things go up and some down and you talked about mercury and selenium and sulphate. I'm wondering if you have any kind of explanation about why you would expect to see some things going up, some going down, in terms of water model?

CHAIRPERSON ROSS: Perhaps it would be worth while to take 5 minutes and see if we can make those work. So let's try that and we'll try to reconvene in 5 minutes.

--- Recess taken at 1:38 p.m.

--- Upon resuming at 1:45 p.m.

MR. PEARSE: On page 10 of your written submissions you talk about -- that's your, I think, presentation. I'm on different page. The written submission.

MR. HAGEN: I believe you were referring to the figure on page 10 so we pulled it up.

MR. PEARSE: I was referring to the text below the figure, but the text says -- you just talk about how different elements, some are going up and some decreasing over time, mercury decreasing over time, and my question really was: Is there an explanation about why those contradictory trends might be happening?

MR. HAGEN: I guess the question is, first of all, these lines on the graph are the Proponent's predictions, and we're just taking them at face value to start with and we'll note some increases and decreases. Are there explanations for those? It would depend on how the model is working, whether the inputs are correct, and I guess the appropriate thing to say about it right now is that if there are discrepancies identified our confidence in that

would be a little less. So even if we could explain why it was happening we may not have the confidence to really say that that was the real reason.

So there would need to be more dialogue and come to a consensus about whether those uncertainties can come down smaller and be more confident about that.

MR. PEARSE: For your recommendation number 1 you talk about, "the Proponent should provide the details of the modelling", and I guess a couple of questions from that; one is, I'm not sure who you're recommending that to, if that's a recommendation to the Proponent, but I think how would that fit into the Panel's deliberation in terms of is this a recommendation that should be done tomorrow or done down the road?

If you could explain how that recommendation would help the Panel.

MR. HAGEN: In an environmental assessment process there is this back and forth interaction with various parties and stakeholders where they're trying to come to an understanding with the assumptions and the way things are

working and eventually reach a consensus and understanding and lower the uncertainty about what the prediction means. So that kind of back and forth is an integral part of the EA and how we make it happen is -- I'm not sure I can say a lot about that.

MR. PEARSE: Thank you for that.

There's been discussion over the past few days and in the submission about the rates of seepage from the impoundment, and let me ask you this: If the seepage rate was an order of magnitude larger than what the Proponent predict, what would you expect to see reflected in the water quality concentrations, given that increased - for Fish Lake - given that increased seepage rate?

MR. HAGEN: Okay. Two points in response to that question; the first is, using the example of seepage we're talking about the Proponent's numbers, NRCan's numbers, the Panel's independent consultant's numbers, having some discussion back and forth, and there does seem to have been a convergence of opinion on what happened, and I believed the Proponent may have

agreed to re-do the model using a more conservative set of numbers.

And the second part of that response is what would I expect to see if seepage is increased? Well, I want to see it in the modelling rather than just speculate on what those might be.

MR. PEARSE: Given an order of magnitude increase in the seepage rate, you would have no professional sense of what you might expect to see in the results? You wouldn't know or...

MR. HAGEN: I really don't want to go further than to say a seepage an order of magnitude higher, there would be an increase in concentration in the lake. It would very much depend on the proportion of seepage in total input or loading to the lake.

So that's why we have a model, and with those numbers adjusted perhaps come to a better idea with more certainty and confidence about what the model is predicting.

MR. PEARSE: The issue of distance from the impoundment to the lake, whether close or 2 kilometres away, how does that affect

the ultimate concentration in the lakes? Is distance a factor?

MR. HAGEN: I think that's more NRCAN's expertise rather than mine. So I could pass it over to them but, in general terms, a longer distance, a longer time for seepage reach and potentially -- I should stop there. It's not really my area of expertise.

MR. PEARSE: Thank you, Mr. Hagen.

In your literature review I uncovered a few examples of sort of lake recirculation. Were there any examples that you found where the complete out flow of the lake was recirculated back into the upper end?

MR. HAGEN: No, we did not find examples of recirculating a lake. We did find examples in the literature research of aquatic systems, which are, perhaps, similar to the cape that the Proponent is proposing.

So looking at those examples as a way of informing the idea of how this might be or not effective mitigation.

MR. PEARSE: I'm not sure if this is a question for you, but I assume someone

has looked at the proposal by Biotech, which is the company's plan for treating the water that will be recirculated? Have you reviewed that proposal?

MR. HAGEN: Yes. Well, I did look at that report and maybe not in enough detail to go into detailed comment about it. But I'd also noticed that one of the other, one of the Ministries, the B.C. Ministries submitted a report on that which I thought was quite good.

MR. PEARSE: Thank you. On page 12 of your written submission you used the term, "Additional intervention to ensure success." I was looking trying to find it here and now I can't, but I think it's on this page somewhere. What did you have in mind about the additional intervention? Are there specific examples that you are thinking of there?

MR. HAGEN: No, no specific examples, but the meaning of that term is just the general appreciation that as management becomes more complex, the implications or the consequences that management may be unexpected which would trigger contingency plans which may be more complicated and you get this feedback loop.

So it really goes to the question of uncertainty about the level of management. And the flip side is that less management is more predictable, perhaps, and has more certainty.

MR. PEARSE: Thank you. Now, recommendation number 2 is at the bottom of that page and, again, what you're recommending here is the Proponent should conduct peer-reviewed research into the implications of recirculating water.

Back to my old question about the timing of this, who and when and how would that recommendation help the Panel figure out how to deal with this?

MR. HAGEN: Okay. The crux of that recommendation was to highlight there is some uncertainty in whether this would work and ideally would have more information about it, and we feel that the decision is up to the Panel to determine how that information will be gathered.

MR. PEARSE: Thank you. I'm going to jump ahead quickly to recommendation 3. I think probably it's a similar kind of response, but there you are talking about the nano

filtration of the Biotech proposal and you're again recommending further research ought to be done and I assume you're going to give me the same response about how that works for the Panel?

MR. HAGEN: That's right, yes.

CHAIRPERSON ROSS: The Panel is getting anxious about the clock ticking, so if you could shorten some of your material, that would be appreciated.

MR. PEARSE: I'm taking a bit of time to do that. Just trying to weed stuff out. Thank you.

Page 16, talking about Big Onion Lake, selenium concentrations long term increasing, presumably; does it reach a steady-state or are the increases just off into the future?

MR. HAGEN: I don't really want to get into the actual numbers and how fast they're increasing.

The point of this page and comment was to draw attention to the discrepancy between the EIS and it's appendix, and that would be cause for some uncertainty in trying to interpret this.

MR. PEARSE: A question about Wasp Lake, and in that section at page 18 you talk about that the MMER's actually talk about seepage as a waste, which I assume it's not legal to discharge waste?

I guess my real question about that is: How would the MMER's be implemented to deal with seepage that doesn't meet guidelines? How does that work?

MR. HAGEN: This section of our plan is more to treating the figure of 50 cubic metres per day which will capture a mine under the MMER.

So what we were saying here is that given the amount of seepage expected or which could have come from the tailings storage facility, the mine may be subject to the MMER and it's requirement.

MR. PEARSE: Sorry, just to be clear, so I understand this, the amount of seepage would be regulated; is that what this is saying?

MR. HAGEN: No, not the amount, but if that amount is greater than the threshold that is in section 2, then the operation becomes subject to the MMER, which means it has to meet

the requirements specified in the MMER.

MR. PEARSE: I'm getting almost to the end, Mr. Chairman.

We've heard some discussion from the company about the ability to respond fairly rapidly to intercept waters that may -- where concentrations are going up, and I would like to ask you what your sense is as to how quickly water concentrations could escalate and whether it's -- well, the idea is whether the mitigation could be implemented or whether concentrations could increase fairly rapidly? If you could comment.

MR. HAGEN: Can you clarify, are you talking about the concentrations in seepage water or the concentration in the lake?

MR. PEARSE: In the lake.

MR. HAGEN: Okay. The question, then, is how confident are we that the Proponent could respond rapidly to increasing concentrations in the lake and I think all I can say is we would identify that as an area of uncertainty. We're not sure.

MR. PEARSE: Let me -- I think what I was getting at was the collection wells and

will they detect -- assuming that they could monitor and detect seepage coming from the tailings impoundment how quickly could things be installed and fixed. And that may be a question you can't answer.

MR. HAGEN: It's not my area of expertise, but does sound like a question that NRCan could address and a hydro geology perspective.

MR. PEARSE: I assume concentrations in the water quality to increase fairly quickly in a matter of days? Weeks?

MR. HAGEN: They certainly can increase quickly if inputs are large enough and the receiver is small enough, but without having the numbers in a model it's not really much point in talking about it.

So this is really why we want to have confidence in the model and what the predictions are.

MR. PEARSE: Thank you, Mr. Hagen. I'm done. Thank you, Mr. Chairman.

CHAIRPERSON ROSS: Any other First Nations interested parties? Any other interested party organizations? Any interested

party individuals? Taseko?

QUESTIONS BY GREG SMYTH:

MR. SMYTH: We just have a couple of questions, Mr. Chairman. Hi. Thanks for the presentation.

I just had one question of clarification, actually, and it goes back to some -- it was about the discrepancies between the table, and I just wanted to clarify the numbers for Big Onion Lake, Wasp Lake and Fish Lake. There was a number of discrepancies between what was in the appendix of the water quality and what was reported in the EIS, and you're asking for clarification about those apparent discrepancies, is that correct?

MR. HAGEN: Yes, that's correct.

MR. SMYTH: Are those the only discrepancies that you're looking for clarification on?

MR. HAGEN: Well, there are a number of discrepancies, as we've noted, and I think the point of pointing them out is just to have some sort of interaction and some dialogue and an explanation for the discrepancy, and maybe

if we have that, then those discrepancies become resolved, and that gives us more confidence and certainty about the way things are working.

MR. SMYTH: Okay. Thank you for that.

CHAIRPERSON ROSS: Should I infer an undertaking of resolving those discrepancies?

MR. JONES: I think that would be a great inference.

CHAIRPERSON ROSS: Thank you. Any other questions at this time?

MR. JONES: I now have a question, who has the undertaking? Sorry, I would think we would take on the undertaking to deal with these ones specifically.

CHAIRPERSON ROSS: That was my assumption as well.

QUESTIONS BY SCOTT JONES:

MR. JONES: Our question was: Are there other discrepancies above and beyond these driving this uncertainty in the outcome?

Maybe if I could elaborate. We've only seen this document from Environment Canada within the last seven days, so just want to

make sure if we take an undertaking that we deal with it completely.

MR. HAGEN: I think if you look at our written submissions we probably detailed most of the discrepancies in there. So if you start with that, certainly that's a great start.

MR. JONES: Thank you.

QUESTIONS BY DYLAN MACGREGOR:

DARYL MACGREGOR: Dylan MacGregor. Thank you for your presentation.

I just have one quick question, and it's related to the response that Taseko presented to the Panel's information request 16, and for the Panel's benefit, that is registry document 400. It provides what Taseko felt was a substantive response in terms of details of the water quality modelling procedures.

I'm wondering if you've had a chance to review that and if you hadn't had a chance that might help resolve some of the uncertainty.

MR. HAGEN: I can't say that I've read submission 400. This information is coming in quick and fast, excuse me.

MR. WRIGHT: I'm wondering if

we can confirm the name of that document; is it a response to information question?

MR. MACGREGOR: It's Taseko's responses to the first set of information requests, as far as I know.

MR. HAGEN: I guess all I can do is say that I did see it, at this point.

MR. MACGREGOR: Okay. I guess perhaps it might be an open question, but a follow up question is if the information in that response isn't sufficient it would be useful to know what further information would be useful.

That response indicates that on pages 521 through 537 of the application, so by my math on-the-spot here, 16 pages worth of description of the modelling exercise, and I just had another look at it, it seems like there's a fair bit of information there to me.

So if you were looking for additional information it would be useful to have some specific guidance on what that would be. It's a bit of a process problem. I'm not sure how that works.

MR. WRIGHT: Mr. Chairman, can we take an undertaking to get back to them?

CHAIRPERSON ROSS: I think that would be very wise and I thank you for the suggestion. Expect I must admit I've forgotten your name and without this I can't tell whether the Court Reporter remember it either.

MR. WRIGHT: Steven Wright.

CHAIRPERSON ROSS: Thank you, Mr. Wright.

QUESTIONS BY SCOTT JONES:

MR. JONES: I may get the phrasing right because I'm referring back to a slide that was towards the end, but I think it was something to the effect that the water management is unproven at this scale, have I got at least the intent of the statement correct?

MR. HAGEN: That was the general statement, that just based on general review that what you're proposing is quite a lot more than has been done before, so it tends to be unproven at that scale.

MR. JONES: I would like to ask what do you mean by "water management" in that context? Are you asking --

MR. HAGEN: What do I mean by water management in that context, is that your

question?

MR. JONES: Yes, and to be more concise, when you say "water management" are you talking about that pumping system, or are you talking about the water treatment component that might be involved, or is it kind of -- I'm looking for clarity on that.

MR. HAGEN: When I speak about water management it's a very general sense. So it would be both of those things, the movement of water around the site, the treatment of water, what happens to it, how you manage water.

MR. JONES: Could I ask if there is some particular component of that system, whether it be the pumping or the monitoring or the potential water treatment, is there some individual component of that that you're thinking is un-tried at this scale? I'm asking can you be more precise about that.

MR. HAGEN: If you could direct me to the actual comment that I made where I used that phrase "water management" I could help you more, but when I say that, generally I'm just talking about the water management in general.

It would be up to your

discretion how you accomplish those goals within your water management plan.

CHAIRPERSON ROSS: Mr. Nelson, I assume you're trying to help us here.

MR. NELSON: Thank you, Mr. Chairman. I have a process question related to the undertakings that have been exchanged so I can wait until this is resolved and maybe we can address that.

MR. JONES: It was right towards the very end of your presentation. I'm just trying to get a greater sense of is there some piece of that water management system, some leg of it, some component of it, that you could be more specific about being un-proven at this scale?

MR. HAGEN: Sorry, you're talking about a specific management action that I would consider to be un-proven at that scale, the nano filtration is probably a good example of that. I'll leave it at that.

MR. JONES: Thank you.

MR. HAGEN: Excuse me, with special reference to recirculation, a few examples in this scale, I think the simplest thing for me to do is put it back to your response to the

Panel's request for information, supplementary information request 15-D where you admitted that you found no examples of lake recirculation in your literature search.

So that implies that that technique would be un-proven if it hadn't been tried elsewhere, and you have no precedents to use to maybe get started or a handle on how it might work in your case.

MR. JONES: Thank you. I think we're done.

CHAIRPERSON ROSS: Thank you very much, Mr. Nelson.

MR. NELSON: Thank you, Mr. Chairman. I almost wandered into a discussion of nano filtration.

There was some undertakings exchanged, as I understand it, and I appreciate that those have been taken to help us understand the information in the EIS.

Our concern is the timing of those undertakings. I understood Mr. Hagen to say this is information that would be normally helpful to the back and forth that occurs in an environmental assessment. What we wouldn't want

to see is this information come in at such a late stage that Mr. Hagen, other regulators, TNG and others, don't have an opportunity to consider and comment on for the benefit of the Panel.

We would appreciate if the Panel would consider imposing a reasonable timeline in terms of when you expect these undertakings to be fulfilled that would allow Mr. Hagen and others to assess that information and give you further advice, since this hasn't been information part of the original Environmental Impact Statement.

I would add, in a similar vein, last week there was some back and forth about modelling for the seepage collection pond, I believe the Panel requested that that be done. The company has advised that they're considering doing that. We would appreciate if a deadline were imposed on complying with that information request, because what we wouldn't want to see is new modelling arriving on the last day or week of the hearings when it's not really available for a critique from other parties.

That's our concern around process and we leave that in your hands.

CHAIRPERSON ROSS: Thank you, Mr. Nelson. I'm going to leave it for now, but before the end of day I would like some advice, both from Environment Canada if it will provide anything else, it's not clear anything else is necessary at this stage, and an estimate from Taseko of when you'd be able to provide that information. That would be helpful. The next questioners would be the Panel.

MR. KUPFER: No questions, thank you.

MR. SMYTH: Thank you for your presentation. I have no questions.

QUESTIONS BY CHAIRPERSON ROSS:

CHAIRPERSON ROSS: Sorry, I do. You talked about selenium concentrations in water not being a good indicator of adverse effects, are there other indicators that may be better; perhaps selenium concentration in fish?

MR. HAGEN: Yes, I can point to the EPA; for example, it does seem to be a consensus that the best indicator is a selenium level in fish tissue, particularly in ovaries or that kind of tissue, and the EPA does have guidelines for that too which I believe the CCME

is considering adopting and B.C. Ministry as well. So it's being worked on in that sense.

CHAIRPERSON ROSS: Thank you very much. I thought I had questions - plural - but I see that the other two have already been asked. So I thank you for your contribution, Mr. Hagen.

I guess I'll now turn it back to Environment Canada for your other two presentations which I understand we will do back-to-back and then have questions.

MR. WRIGHT: Yes, Mr. Chairman. I thank you for your patience and accommodation.

Next I'd like to turn to Ms. Manon Lalonde, who is going to present on -- sorry. I'm confused. Dr. Emma Watson, who is going to present on climate change.

PRESENTATION BY DR. EMMA WATSON:

DR. WATSON: Mr. Chair, members of the Panel, Elders, Chiefs, ladies and gentleman, my name is Emma Watson --

CHAIRPERSON ROSS: Dr. Watson, could you get a little closer to the microphone, please.

DR. WATSON: Spelled E-M-M-A,

W-A-T-S-O-N. I am an environmental assessment climate data analyst at Environment Canada specializing in climate science. I will be speaking to you today about climate change.

Climate change considerations are relevant to the project because future climate change over the closure and post closure period has been projected to be different from the current and past climate for the area.

Environment Canada has reviewed the climate change information presented in appendix 2.7.2.4AD and relevant sections of the main EIS as well as IR18 and SIR18, which related to climate change and lake productivity.

Environment Canada agrees with the Proponent's assessment that the range of climate due to natural variability in the observed climate record would likely be sufficient to characterize the range of climate over the construction and operational phases of the project. So the next 20 years or so.

However, Environment Canada has identified concerns with the Proponent's assessment of the future climate, so climate beyond the period of mine operation, and secondly

in their evaluation of the observed climate records.

First I'll speak about the concerns we had with their assessment of future climate change.

This is a quote from the Proponent's response to IR18:

> "A review of the historical climate data for the past 100 years would indicate there is no basis for assuming any material change in temperature and precipitation in the region within the time frame of project development and closure.
>
> Environment Canada notes that, regardless of the strength or sign of historical trends in the region, observed changes cannot be used to make direct inferences about future climate. future climate projections must be based on an understanding of the physical climate system and

the factors that influence climate."

The second concern we had on their assessment of future climate change is that in their responses to IR18 and SIR18 the Proponent appears to have extended linear trends in observed temperature records from Barkerville and Williams Lake to project future changes for the area.

Trends and variation in past climate records reflect both natural variability of the climate system and human influences. The changes due to natural variability are not predictable beyond the short term.

When I say "short term" I mean seasonal or annual. So these are shorter than the operation and closure time scale of the project.

A trend that is part of a natural variation may not continue in the future, therefore the simple extrapolation of the linear trend from an observed record to predict future climate is not justified.

In response to both of these issues Environment Canada recommended that an ensemble of climate model projections - and by "ensemble" we mean different models for a range of

scenarios - be examined to assess the range of possible future climate change for the region.

Information on potential future climate can only be provided from climate model simulations. However, due to simplifications of complex climate processes in climate model structure, uncertainty regarding future emissions and in estimating natural variability, it is common scientific practice to use a range of possible change from an ensemble of model simulations.

This is to reflect the uncertain nature of climate projection.

In response to the Panel's request in SIR18 the Proponent provided projections of annual and seasonal temperature and precipitation.

The projections provided in table 1 of SIR18 are considered reasonable by Environment Canada. However, Environment Canada recommends that the consideration of possible impacts of climate change presented in SIR18 be based on the range of possible changes from the ensemble of projections, not the ensemble mean.

This more robust scientific

approach ensures that the range of possible impacts and uncertainty in projections is adequately considered.

Now, I will talk about the Proponent's assessment of regional climate.

In the climate change appendix, so that appendix 2.7.2.4AD the Proponent provides an assessment of trends in precipitation and temperature data from the Barkerville climate station and a streamflow record from the Chilko River. And they later expanded this to include the Williams Lake temperature records.

From these they conclude that climate in the region has been consistent and that there is no clear evidence of climate change effects on the streamflow record examined.

It is Environment Canada's opinion that the Proponent does not demonstrate that the climate and hydrological trend analyses they present in appendix 2.7.2.4AD and IR18 are representative of regional conditions or long term climate variability at the site.

Climate trends for a particular place are best evaluated from multiple station data records to better reflect regional

conditions, because climate records from individual sites may include localized site-specific conditions which do not represent the longer term regional-scale climate signal.

Climate change trends need to be assessed on a regional or a larger scale. Better assessment of trends in observed climate and hydro climate variables could have been achieved by analyzing additional records from the region and/or synthesizing the peer reviewed literature and/or reports.

Regional record for this area do show considerable warming, particularly in minimum temperatures in the winter and spring over the 20th century.

This slide shows trends in annual temperatures for minimum temperature, mean temperature, maximum temperature and then also an annual precipitation over the period 1900 to 2004, and the scale on the bottom left corner shows the range of temperature increases over that period.

So you can see that the greatest increase are in minimum.

And the next slide, a similar set of plots, except this is showing seasonal

trends in minimum temperatures, just to highlight that the trends are different for different seasons. Again, their strongest increases in temperature are in winter and spring.

The published literature also indicates that significant changes in hydrology have occurred in this region and further changes are projected for the future; these include decreased winter snowpack, earlier snowpack-driven peak discharge and decreased streamflow volume during summer months.

Our key recommendations are in terms of their assessment of the future climate changes. The Proponent is encouraged to base the evaluation of possible impacts of climate change presented in SIR18 on the range of possible changes rather than the mean of the ensemble of climate model projections to account for uncertainty in the projections.

And, second, in terms of assessment of regional climate, the Proponent is encouraged to synthesize the peer-reviewed literature and/or reports to receive a better assessment of trends in observed climate and hydro climate variables.

Thank you for your attention.

CHAIRPERSON ROSS: Thank you, Dr. Watson. I understand we'll move to Ms. Lalonde's presentation which will be far away.

PRESENTATION BY MANON LALONDE(Via telephone).

MS. LALONDE: I'm calling in from to Ottawa.

So, Mr. Chairman, members of the Panel, Elders, Chief, ladies and gentleman. My name is Manon Lalonde, spelled M-A-N-O-N, L-A-L-O-N-D-E.

I am a senior project program engineer at Environment Canada specializing in the area of surface water hydrology. I will be speaking to you today about the surface water quantity component in the water balance assessment done by the Proponent.

Page 2. Hydrometeorological parameters such as estimates of precipitation over water bodies and runoff from catchment areas are used as input to the water balance assessment to quantify the water supply from precipitation.

These parameters which are linked to the tailings storage facility, or TSF, vary naturally in space and time and need to be

properly characterized to increase the accuracy of the water balance results; for instance, it is important that these parameters represent the long term mean average condition representative of the site and temporal variability, in other words, words the month-to-month and year-to-year changes in precipitation and runoff amount.

The focus of our review and of this presentation is on the proper characterization and consideration of these parameters in the water balance assessment that was conducted by the Proponent, and I want to note that this review was completely based on information found in the EIS, because for to the New Prosperity project Environment Canada has had no opportunity to exchange any information with the Proponent.

Page 3, in estimating the long term mean conditions of the site the Proponent faced a common problem in ungauged areas, especially in remote mountainous areas, that is having limited site-specific meterological and streamflow data, challenging site data collection conditions, possibly having localized influence such as orographic effects and having a limited

amount of regional data to rely on.

I will pause here to note that orographic effects are the effects of the rapidly rising air forced by mountains and creating precipitation. All these factors lead to uncertainty in estimating the mean precipitation and runoff amounts.

And to account for this uncertainty in the initial project the Proponent had conducted the water balance assessment for the different scenarios using upper and lower balance of means, hydro meterological parameters estimate. However, this approach was not used for the New Prosperity Project, and typically a sensitivity analysis would be employed to estimate the effects of uncertainty on results of the water balance assessment. However, there is no information provided in the EIS for the New Prosperity Project that would indicate that such a sensitivity analysis was conducted.

Page 4. In accounting for natural temporal variability in the water balance model, the Proponent has characterized precipitation and runoff as statistical distributions with a mean value and a measure of

dispersion around the means, and conducted Monte Carlo simulations that enabled possible combination of conditions.

The year-to-year variability, or the dispersion around the means was described using coefficients of variation which were obtained by analysis of the Water Survey of Canada streamflow data at regional stations.

Environment Canada views this approach and the coefficients of variations that were used as reasonable.

Page 5. So now moving on to the Proponent's results for the operational phase. The Proponent's results indicate that there is a high probability of operating in water surplus conditions with enough water buffer in the operating pond to operate the mine in consecutive dry years.

The Proponent has defined contingency measures that would be used if there's a water shortage or if there's an excess of water in the tailings storage facility. However, we note that we found no clear information in the EIA indicating what would be the probability of encountering such shortages or excesses.

It is Environment Canada's view that the assessment was performed using accepted engineering hydrologic methods, indicating that results are plausible, but uncertainty in estimating long term mean precipitation and runoff was not well-documented in the EIS. It would, therefore, be prudent to consider the probability of encountering extreme hydro climatic conditions that made lead to shortages or excesses as higher than depicted in the EIS.

Page 6. One of the mitigation measures proposed by the Proponent to minimize chances of discharging contaminated water to the environment, and I'm quoting what the Proponent wrote on page 1,360 of the EIS. So the quote is:

> "Conducting annual reviews by an acredited consultant of tailings hydrological model, operation and construction of the tailings complex and water balances based on site collected meteorological data."

However, we know that the water

and hydro geology, and I'm referring to page 1,495 of the EIS, it has no hydro meteorological components. So it is Environment Canada's view that the proposed annual reviews of models and the site collection of data are important to ensure the water management plan continues to reflect the best available information. And we recommend that that local monitoring including precipitation, temperature, other parameters needed to estimate evaporation, local stream flows, as well as lake and pond water levels.

Page 7. Now looking at the Proponent's results and approach for the post-closure phase. The Proponent's result indicate there will be a positive water balance on average or a water surplus with the potentially acid generating waste completely submerged during post closure and the Proponent estimates an annual post closure water surplus of 6.6 million cubic metres.

To account for the variable nature of the water supplied to the TSF in post closure, the Proponent proposes a design comprising a large supernatant pond with a capacity of 54 million cubic meters.

A question that may be on people's mind is what if seepage rates are higher than estimated by the Proponent. NRCan has estimated, as you know, that higher seepage rates are possible, possibly as high as 8,650 cubic metres per day or even as high as 10,000 cubic meters per day.

We looked at what that meant for the water balance and water input as this rainfall and run off fill up that water output as evaporation and increased seepage such that we continued to have a positive water balance on average. This indicates that the water would accumulate in the pond over the long term even with the increased seepage rates. However, we note that the water balance methods focuses on how much water is left in the pond and, as such Environment Canada can not infer any conclusion about the state of the saturation of the material within the TSF because this aspect pertains more to hydro geology, and this aspect was covered by the presentation of (unintelligible) from Natural Resources Canada on July 26th who, has identified limitations with the methodology used.

Page 8, it is Environment

Canada's view in prior years there may be more water leaving the TSF than coming into it resulting in a net annual water deficit or negative water balance.

We view the large supernatant pond, as I mentioned, on the previous slide as a measure to withstand water deficits in dry years, but with we can't infer conclusion about the state of saturation in the material within the TSF.

I'm going to take this opportunity to note that there is an error on page 23 of Environment Canada's written submission, it's in the third paragraph, the word "underlying" should be replaced with the word "within."

Now, about climate change, it is very difficult to quantify at this time the possible impact a changing climate would have on the annual water supply to the TSF in post closure, therefore Environment Canada would advise that should the project proceed the Proponent takes steps to ensure the detailed design of the supernatant pond and the need for additional mitigation measures would be based on the best understanding of the site's hydrological conditions as refined during the operational phase

monitoring program and also on up to date climate change projection and methods as these will improve over time.

Page 9, to conclude, the Proponent has used an accepted engineering approach using probabilistic presentation of precipitation and run off to account for natural variability. However, Environment Canada's opinion is that uncertainty in estimating long term hydro meterological parameters were not described adequately in the EIS. It would be, therefore, prudent to consider the probability of encountering extreme hydro climatic conditions as higher than depicted in the EIS during the operation.

Environment Canada views the monitoring of local site conditions and the periodic reviews of the model as important to ensuring the water management plans effect the best available information.

Also, we advise that good practice would entail reviewing the proposed supernatant pond site for post closure at the detailed design phase based on refined hydro climatic knowledge, including up to date climate

change projections and methods.

And that concludes my presentation.

CHAIRPERSON ROSS: Thank you, and I thank those who arranged for your presentation to be as clear as it was. Anything else at this Environment Canada, Mr. Wright?

MR. WRIGHT: No, that is all.

CHAIRPERSON ROSS: Other government of Canada, any questions for Environment Canada?

Any First Nations interested parties? I'm seeing a negative over there. Any interested party organizations have any questions for this portion of Environment Canada's presentation? Any individual interested party have any question for Environment Canada? Taseko?

QUESTIONS BY MR. JONES:

MR. JONES: I had a question for Dr. Watson and I think Ms. Lalonde answered it but I'm going to ask it any way.

I understood Environment Canada doesn't see an issue with regard to climate change in the water balance during operations, more talking about climate change but the uncertainty

around climate change to regions. I guess my question was, being as the closure plan is something that evolves would it be more appropriate to make sure that as that plan evolves we're using the latest and greatest regional climate change information? And the reason I say I thought I heard the answer was I think Miss Lalonde's comment about -- I think she said do exactly that.

DR. WATSON: Yes, I'd recommend using the most up to date models because the scenarios change as well for the future. They're being refined right now, so using those up to date models.

MR. JONES: My other question was I guess for Environment Canada in general related to water quantity and climate change, would you expect the process leading up to permitting will provide additional information regarding to some uncertainties that you seem to be pointing out?

MR. WRIGHT: I don't know if Ms. Lalonde might be able to help answer that question. Is she still on --

MS. LALONDE: Yes, I'm on. I

may be able to help. But my understanding is that permitting is within the mandate of Environment Canada.

So right now we're looking at possible adverse impacts to the environmental assessment. I think permitting is more of the purview of the province. So I think that's as much as I can help with that.

MR. JONES: And I had a question for Miss Lalonde --

CHAIRPERSON ROSS: Sorry, before you move along. I thought I heard an earlier suggestion that Environment Canada may have a permitting role with respect to the metal mines effluent regulations as well. That would be right in your ball park, would it not?

MS. LALONDE: It's Manon Lalonde speaking.

I don't know if someone from mining and the MMER is in the room and can maybe address that. Maybe I spoke too quickly about that.

MR. HAGEN: Manon, I can answer that question. Two aspects of that; first, the MMER is not a permitting requirement. The

operator of an operating mine is expected to comply with the regulation. So we don't go through an approval stage at any time.

CHAIRPERSON ROSS: Thank you for that. Mr. Jones, go ahead.

MR. JONES: I think Mr. McManus has a question.

QUESTIONS BY MR. MCMANUS:

MR. MCMANUS: Thank you. John McManus with Taseko. In listening to the whole exchange and the presentation and exchange with Mr. Pearse, what I heard again and again, I think, was that part of the issue is there hasn't been the back and forth between the Proponent and Environment Canada, and that is, in your view? Part of the cause of the uncertainties.

MS. LALONDE: The question is about?

MR. HAGEN: I can respond to that question. The question is a good point. The opportunity to have a back and forth dialogue during a working group session during the EA process is very useful, and when we have Proponents that take advantage of that and engage in that kind of dialogue it enhances the

understanding that all parties have about the level of uncertainty and confidence that we would have in possibility of effect.

MR. MCMANUS: Thank you. And I'm not sure -- this is probably a process issue that I'm going to ask next, a lot of the other uncertainties we've encountered moving forward in this, we've said that type of tightening up of understanding of what exactly is going to happen doesn't have to happen before or during the EA process but could come afterwards.

I wonder what your thinking would be if we could have a working group committee to deal with these uncertainties. I didn't hear anything that stopped the project but things that you don't quite understand where we stand.

MR. WRIGHT: We are involved in an EA Panel review process and it would be up to the Panel to determine how they wanted to engage further.

MR. MCMANUS: I just pose the question and I don't have an answer other than we would be willing to do that if it's appropriate.

CHAIRPERSON ROSS: Any further

questions, Taseko?

MR. JONES: No, I think that's it. Thank you, Mr. Chairman.

CHAIRPERSON ROSS: Panel, any questions?

QUESTIONS BY MR. KUPFER:

MR. KUPFER: I'm not sure this is a question, but so I'm clear. Is Environment Canada requesting further information from the company at this time?

MR. WRIGHT: We have made a number of recommendations related to the desirability of further analysis and information be undertaken before the decision is made I guess.

MR. KUPFER: Follow up, I think. In your mind does this require some exchange of information in the near future, fairly soon, in another words, or are you just suggesting it be left that way and for us to determine whether we need more?

CHAIRPERSON ROSS: I think, George, what I earlier asked Taseko to do was to give us an estimate before the end of today when it could provide the information that has been requested by Environment Canada by way of an

undertaking that will help us to move forward at that time.

MR. KUPFER: Then I presume Environment Canada would review that quickly?

MR. WRIGHT: We would undertake to review it as quickly as possible but he'd have to understand completely what was being requested.

QUESTIONS BY MR. SMYTH:

MR. SMYTH: Thank you for your presentations. I've taken note of NRCan talking about the possible deficiencies of the water in the TSF at closure and it's been reiterated again by you folks and so my question really - or request - goes over to Taseko, maybe not necessarily now but at some stage in the hearing you could tell us if this took place would you would mitigate against that?

MR. JONES: Specifically against a shortage of water, is that the question?

MR. SMYTH: That's correct, the shortage of water in the TSF post closure.

MR. JONES: Can we take that as an undertaking?

QUESTIONS BY CHAIRPERSON ROSS:

CHAIRPERSON ROSS: That would

be appreciated. Thank you very much. For Miss Lalonde I have some perhaps related questions.

At the bottom of your slide 5 you indicate it would be prudent to consider the probability of encountering extreme hydro climatic conditions as higher than depicted in the environmental impact statement. Do you have any sense of how much higher or specific extreme hydro climatic conditions? That would be especially important.

MS. LALONDE: Yes, thank you for your question.

The short answer is no, I don't have an idea of how much higher they would be, and that's why a sensitivity analysis comes in handy in those situations. When facing uncertainty in the input parameters you're able to use this type of analysis to say well, what if the rainfall and the runoff really is lower than what I used as an average condition? You run those into your model and see how the results would change. Let's say that the result currently gives you that on any given day you run into the chance of having a 5 percent, let's say shortage, if you do a sensitivity analysis with the lower value and you

see that the probability goes up to 7 per cent, well, you say, no big deal. But if you do the sensitivity analysis and it goes up to 50 percent you say oh, I have a problem.

So that's why this type of analysis is really useful, and that's why I was commenting that it was too bad it's not part of the EIS. So it's difficult to say.

CHAIRPERSON ROSS: Thank you. That helps. On page 8 of your presentation you refer to the fact that Environment Canada can not infer the conclusion about the state of saturation of the material within the tailings storage facility.

I want to be very clear about what material you're referring to, are you referring to the tailings or are you referring to the potentially acid generating rock that would be stored in the tailings storage facility?

MS. LALONDE: I'm referring to anything below the ground level. I'm not sure how deep the PAG material would be placed. So anything below ground level I'm saying that the water balance assessment, the part that I looked at, balancing input and output and water

quantities, it doesn't tell us anything about the state of the saturation of material within or below the ground level or the surface of the TSF.

CHAIRPERSON ROSS: Thank you. That helps. Where he have no further questions for Environment Canada.

Thank you so much for your presentation and your helpful contributions to the Panel review.

MS. LALONDE: You're welcome.

CHAIRPERSON ROSS: The next presenters are Rina Freed and James Kuipers on behalf of the Tsilhoqot'in National Government.

In terms of how this will unfold, as soon as this presentation has been made, we'll have a short break and come back for questions.

MR. PEARSE: Mr. Chairman, Tony Pearse. We have two presenters likely to be half an hour each. So I'm raising that because of your proposed time for a break. If you're happy to go, we'll go, but it's just a thought.

CHAIRPERSON ROSS: Our schedule has them 30 minutes, period. So why don't we have a break now and you three can work on how you can

come closer to our schedule. We'll be back in 15 minutes.

--- Recess taken at 3:00 p.m.

--- Upon resuming at 3:15 p.m.

CHAIRPERSON ROSS: Good afternoon, ladies and gentleman. Just before we get started I would like to deal with two matters.

The first one is an apology to TNG. Apparently the request was properly made and we managed to bungle it. So I appeared to be accusing you of trying to take too much time. We would still appreciate it if you could shorten it, but I want to be clear about the responsibility. It is on behalf of ourselves. Thank you very much.

The second one is I was asked to clarify the Panel's understanding of the request for an undertaking by Taseko to respond to some concerns that Environment Canada has raised. This is our understanding, and I'll elaborate a little bit as I go through it.

There were discrepancies identified in Environment Canada's submission, and I think it's clear that Taseko agreed to deal with those -- clarify those discrepancies.

In addition, there were some other requests in the Environment Canada submission, and I understood that Taseko had agreed to provide some further information, such as the more details about the water quality model for Fish Lake, and I think that would be helpful for the Panel.

In addition, if there are other matters that would benefit the two, we would encourage Taseko and Environment Canada to talk so that they can work things out to enhance the prospect of there being a helpful response. Environment Canada seemed to think it was necessary for us to bless such discussions. I'm not sure why, but we certainly do. We agree with Environment Canada that getting together to discuss these matters is helpful. We won't engage in that, of course, for reasons I have discussed many times, but for the Ministry that is not only helpful -- not only proper but helpful is what I'm trying to say.

Mr. McManus?

MR. MCMANUS: Thank you, Dr. Ross. Just one question on that. I don't know how much engagement we can have while the

environmental assessment process is still going on. A large portion of our team is going to be totally tied up so I think some of those discussions in my mind would actually happen after we finish the hearings.

CHAIRPERSON ROSS: Let me be clear. I'm not talking about a big party or a major workshop. I'm talking about some phone calls to clarify. I think that's the sort of thing that would be helpful and I hope possible, and that's what I had in mind. If you need to hold a 3-day workshop to deal with those things, then I would encourage the two of you to find a way of having a 10 minute phone call -- sorry. Whether it's 10 minutes or whatever, is between the two of you. If there's need for clarification, make a phone call or something. That's all I'm looking for.

MR. MCMANUS: Certainly. I will call Mr. Wright. Thank you.

CHAIRPERSON ROSS: Thank you, Mr. McManus. At this point, I'll turn to over to TNG.

MR. PEARSE: Thank you Mr. Chairman. It's Tony Pearse for TNG. We have two

presenters this afternoon.

Dr. Rina Freed, is a registered professional environmental engineer. She has 12 years experience as a water quality modelling specialist, and she'll be talking about the Proponent's water quality modelling.

We have Jim Kuipers who is a professional engineer in mining and minerals. He has 30 years experience in the mining industry and the mining environment compliance area.

We would propose to start off with Dr. Freed and then make her available for questions and then move on to Mr. Kuipers. Just as a note, Mr. Kuipers -- there is no overhead paper for Mr. Kuipers' presentation. We just got the one.

PRESENTATION BY DR. RINA FREED:

MS. FREED: Mr. Chairman, members of the Panel, elders, colleagues, and members of the public, thank you for the opportunity to speak. The spelling of my name is R-I-N-A, F-R-E-E-D. I specialize in mine water management, water quality modelling and hydro geology. For over a decade I have been working primarily with mining companies to model the water

quality impacts of proposed operating and closed mines. I have reviewed, as well, a number of mining projects. So the title of my talk today is the water quality modelling as a review of the New Prosperity EIS, and I work with Source Environmental Associates.

The SEA review has focused on Fish Lake, in particular, the water quality modelling. We are familiar with the key pathways of concern which we also identified which are the seepage from the tailings storage facility. There's also other sources including the ore piles and things like discharge from the tailings pond post closure.

Now, one of the key questions of this review is will the proposed water treatment of Fish Lake achieve the goal of maintaining a healthy, functioning ecosystem. The SCA answer to this was not clear in the environmental assessment documents and appendices provided and so a water quality model was developed for Fish Lake in GoldSim, a standard industry software, to evaluate the effectiveness, especially of the treatment.

We were familiar with the

different treatment proposals that Taseko has made so far for Fish Lake. There is the May 2013 biotech proposal, this provide a conceptual plan for treatment and that was revised recently, this month, by Taseko. So one thing we need to ultimately be aware of is that the water quality predictions in the EIS don't take into account treatment of Fish Lake.

So that is the answer then to why we're building this water quality model of Fish Lake so that we can take into account the effect of the proposed treatment.

Rather than model all of the parameters of concern which would be a bit of an overwhelming undertaking for a review, cadmium was selected. Cadmium does illustrate the effectiveness of the treatment just as another parameter of concern could, such as the ones listed here, and also cadmium is a very sensitive constituent in the aquatic ecosystem.

Here I've put up for your benefit, some of the water quality results presented in the EIS from appendix 2.7.2.1-I. So these are the figures we've been referring to. That is the main basis for the information

provided.

Now in this graph, it shows the different water management periods: 1, 2, 3, 4, 5; and 5 and on is post closure. So I mostly focussed on that in this particular slide showing that if you look at the mean value that's in blue there -- there's lots of squiggly lines -- but, generally speaking, we're at about .09 micrograms per litre for cadmium. Just for reference the guideline is shown on this graph as well, and that's around .03 micrograms per litre. So I've changed everything into micrograms per litre rather than milligrams per litre so it's easier for everyone to not have to deal with all that many zeros.

Now in the EIS there's a number of cadmium concentrations reported in those same figures. What I have done for you is summarized them here in this figure so that you can have a sense of them. For example, the tailings seepage tales and waste rock have a combined seepage for water of approximately 1 milligram per litre -- microgram per litre. Thank you, Tony. And in the seepage ponds we're in the 1 to 3 microgram per litre where it's in pond 2 or the 3 to 6 microgram

per litre range according to those graphs.

In the streams to Fish Lake were approximately .1, and Fish Lake itself you've already seen in the .09 range. The ore seepage piles are surprisingly high in terms of maximums up to 6 milligrams per litre.

This graph, this figure also helps understand a little bit about the concern of TSF seepage paths. So you can see the tailings facility there, at least part of it in the slide, and the seepage ponds as well as I've depicted 10 capture wells as proposed by Taseko spread out across.

There's some arrows -- actually, I can probably show them -- there's also some arrows showing how seepage can bypass some of these captures wells and the seepage ponds and the ditches to eventually end up these -- in the streams and then in Fish Lake.

So for reference, the B.C. water quality volume for cadmium, which is hardness dependant, is in the range of .03 micrograms per litre.

Let's see, make sure I'm not speaking too fast, am I?

Here, I've added a slide for the ore stock pile, surprisingly high at 6 milligrams per litre maximum and partly put this slide in there because I haven't found a basis to explain these concentrations. This leads back to the TNG information request to understand the modelling that was completed for Fish Lake in more detail. There is some information provided especially if one digs around and spends an inordinate amount of time putting it all together, which I have, and I haven't been able to get past some of the source loading such as the ore pile. I haven't quite been able to understand those in sufficient detail.

Just to highlight the TSS seepage concern from the point of view of SCA. We are concerned that this pathway to Fish Lake from the TSF is a fatal flaw of the project. Now Taseko has discussed this concern in the original hearings, and we're familiar with that. I have appended to my written submission the memo that was provided where they model the concentrations of a number of parameters based on putting the tailing storage facility on land. And in my opinion that was an alternative assessment. That

was their chance to assess this exact same alternative that they're putting before you right now. I think maybe they've done some more detailed engineering, but in my opinion that was already said to be flaw because of the seepage concern and the water quality guidelines in Fish Lake.

So SCA has developed a GoldSim water quality model to consider Taseko and NRCan seepage estimates from the TSF, and because NRCan only looked at the seepage out of the tailing facility not amount captured or amount escaping to Fish Lake, I used the same assumptions that Taseko used for the capture efficiency.

This picture depicts what a GoldSim model looks like to some extent. There's water balance contained in this container which basically keeps track of water going in and out of this reservoir. And there's cell pathways. These cell pathways keep track of mass. So in this case cadmium. How much kilograms of cadmium goes in and how much goes out. The model includes treatment and so that takes mass loading out of the Fish Lake system as conceptualized here. And there's also a sync(ph) for the Fish Lake outflow.

Now I am lumping Fish Lake and the inlet streams which I'll show in the next slide. And so all the mass balance loading assumptions are listed here. Finally, we get a water quality prediction for Fish Lake.

This is a conceptual model showing how the model is put together. So as I said, this is representing Fish Lake and the inlet streams, and so we have lumped them together for ease of presentation here. There's just all the mass loadings in and all the mass loadings out.

So what is coming in? There is the TSF seepage, of course, there's runoff -- overland runoff from the project site and then there's the other sources. And those include the ore stockpile and things like the TSF pond to closure.

One of the outlets, we have TSF pond pumping and Pit Lake at closure and another outflow, of course, is the recirculation that is proposed. So the recirculation line in the updated July 17 proposal by Taseko does contain provision for treatment off that line. So some percent of the recirculation gets treated. So this is the conceptual model that was considered

in the mass balance modelling.

This diagram from the EIS, it's a little bit busy. This is the one that SRK would have put together and put in the EIS. But it does help understand the sources to some extent such as the ore pile. And this is sort of the level of information that we're kind of trying to sort through when we try to review the model.

The sea water balance model flows are listed in this table here and the interesting thing here is that the recirculation value compared to the outflow value is about one-half, so yet about a half of the inflow coming from overland runoff, half recirculation and precipitation evaporation are fairly balanced. And then the other thing I've listed here is the treatment rate. It's 35 percent of recirculation. I recall 2 million metres cubed a day was in the July recent treatment rate proposed. The other treatment rate that Biotech suggested was 8,000 gallons per minute. So now when we compare these on a litres per second basis to the inflows and outflows, you can see that the more recent proposal was less than half the Biotech proposal, and the treatment rate in terms of the Biotech

rate is less than but fairly similar to the recent recirculation rate. So I think that's helpful just to see all those numbers and the same units.

Now, the TSF seepage rate, this is an interesting component of this work. We know that NRCan predicted some of the values. Very familiar with the 28.1 litres per second, that's total, going towards the main dam. Nothing to do with deep ground water and 65 percent of that is estimated by the seepage modelling to go through the main dam; 35 percent of that is estimated to go under the main dam.

Now, the way I interpreted that is that NRCan's estimate from the base case seepage modelling -- this isn't the conservative case, but the base case -- that value 59 litres a second is comparable to the flow of seepage under the dam. So then when we look at what is the actual seepage to Fish Lake -- this is the part NRCan didn't necessarily discuss -- then the EIS predict 2.4 litres a second. It took me a little while to sort through all that, but eventually I saw that that was including all the different components of seepage related to the TSF including base and seepage and so on. Anyhow, that compares

to if we apply the 50 percent that goes past the ponds, the 40 percent that goes past the capture wells, then it's a 20 percent bypass over around 12 litres a second of seepage into Fish Lake based on the NRCan seepage modelling and these are the assumptions from the EIS as far as I could gather.

Now, this slide shows in a little more detail just the 8 percent seepage pathway passing under the main dam. This is where I understood how this assumption will work. A hundred percent of the seepage passes through -- gets captured. So, I'm not going to try to go through this detail, but if anyone needs that explained, then I'm sure Taseko could do that.

Okay, so the mass balance assumptions. Those are related to the kilograms of cadmium, for example in this case, passing through the system. In terms of overland runoff assumed to be -- at least if it's non-contact water -- assumed in the baseline level and that's in the order of .025 micrograms per litre. This comes directly from the Knight Piesold Modelling Water Quality Report. The TSF seepage water quality very clearly explained in terms of waste rock and tailings in Appendix H from that one page

source term appendix. The treated outflow now in the Biotech case for cadmium was .001 micrograms per litre and the revised rate was a bit lower than that, 5 times lower.

Now for reference, the B.C. water quality guideline is there and that's also listed in the EIS. And the treatment methods I think we're all familiar with as outlined in the Biotech report.

So, what were the modelling approaches taken, what were the scenarios? In the first case the scenario was just the same thing as modelled by the EIS. The same seepage rates, the 2.4 litres a second and this comprised a model calibration step.

In the next scenario the seepage rate remained the same but treatment was added in the Biotech proposal.

In the next case, the only thing that changed was the NRCan seepage flow rate, the 12 litres a second I explained earlier was included in this scenario. Then I admit I had that all finished and we got the revised treatment approach from Taseko so I added the scenarios for that. All that changed from C to D is the

treatment approach. And in Scenario E we have one more scenario, the maximum possible treatment capacity that would be 100 percent recirculation.

So as an example providing water quality modelling results here for Scenario C, this is the NRCan seepage with the Biotech treatment. So starting at the bottom here is the water quality treated outflow, the affluent, from the Biotech proposal. This is scenario C with the Biotech treatment. Then in green we have the water quality guidelines. So this is micrograms per litre on a log scale so that we're able to compare numbers. And so moving up from the guideline -- I'm sorry -- is the actual water quality prediction.

So now, I should mention here that only 5 years are shown, but the model was run a hundred years but because I was primarily concerned with the post-closure situation and mean average results, the annual average results, the result that's shown here for five years is they don't change after that. But you can see how we start at around baseline, similar to the guideline here, and increase to the level of the red line which is the EIS proposed closure rate. So why is

it that with treatment we end up right back where we started? In this case it's because of the increase in the TSF seepage from the NRCan prediction. And then, finally, at the top just for reference is the actual pour water quality of TSF seepage.

So that is generally what the example looks like.

The results, I've tabulated here for the different scenarios, so the in EIS the prediction was .09. With no treatment this was the model calibration step I would like to mention here that in that conceptual model earlier there were the other sources so this includes calibration of the other sources since I wasn't quite clear on what those were per se. I used the value and the EIS to calibrate that and then I used the TSF seepage rate as well. So I hope that's clear, but please ask me if it's not.

The first Scenario B with the EIS and the Biotech treatment, we're still in the general range. It does make a difference. With the Scenario C with the NRCan seepage, we're back up like we just saw in the previous example.

Scenario D the revised

treatment approach 35 percent recirculation. We are very similar to the EIS prediction. This could be surprising, but recall that the treatment rate, capacity at 35 percent was less than half of the Biotech treatment rate. So it's actually not that surprising because the water quality in Fish Lake is most sensitive to the capacity of the treatment, the flow rate, rather than the actual water quality of effluent predicted because in the mass loading water balance that makes a much bigger difference.

Finally, interesting results here. At a hundred percent recirculation, so this would be the maximum amount we could recirculate in the system, the cadmium levels are still above the B.C. water quality guideline. And so as far as I can tell, we can't really increase the water -- I don't see how Taseko could increase the treatment rate above this since they're saying they're just going to go up to the recirculation rate, and the recirculation rate does reflect the inflow. So I think that even with treatment, you have a clear conclusion here. We're not meeting the water quality guideline.

Now, I did take particular

exception to the statement by Taseko that the inflow concentrations would somehow be maintained at 75 percent of the guideline. So if the guideline is .03 micrograms per litre for cadmium, I don't see how there's any basis for this claim we when have the clear mass loadings that they have already predicted themselves for seepage into Fish Lake and then we have the potential base case example from NRCan to consider. This really flummoxed me. I couldn't see how this was possible. I don't think it is technically possible to maintain inflow concentrations at the Fish Lake water quality that would be the inflow in to the treatment process at 75 percent of the guideline.

Okay, so now I'm going to talk about some other issues other than the modelling that was done. In particular, Taseko has not indicated why the upper estimates of cadmium concentrations are 6 times higher for Pond 2 in the range of 6 micrograms per litre, and again I'm picking on cadmium, than for the TSF seepage pore water. So this is -- and I'm sure there's some explanation in the SRK water quality model, but that wasn't provided, at least not in a way that I

could -- I don't think it was provided in a standard approach.

In Appendix 2.7.2.4 also the same seepage ponds are shown with 10 times lower cadmium concentration. I don't know which one is in error and so this could result in under prediction or over prediction. It's hard to tell. But here can you see this is milligrams per litre so we're in the 6 milligrams per litre range in the seepage pond. And there's got to be another source, obviously, other than just the TSF seepage going into that pond because the TSF seepage is much lower.

Another issue related to Fish Lake water quality modelling, there's abrupt change, so we go along, we've got operations, end of operations, closure 1, closure 2, I believe, and at some point around year 2050 three's a sharp spike in Fish Lake in sulphate levels, at least, well, for all the maximum and for the different statistical graphs here and that hasn't been made clear. In general the rationale for the water quality result presented in the appendix provided, the results are not clear.

Okay, now I'm going to look

into some of the mitigation methods that have been proposed and talk about that to some extent. And, for example, the TSF has somewhat of a liner propose, I suppose, and my comment is that there's a large uncertainty regarding the spacial extent and hydraulic connectivity of the TSF till foundation materials. I understand that the effectiveness of this till liner to limit seepage is very questionable and the EIS assumptions have been debated already, and I think there's a commitment by the Proponent to augment the liner, this natural liner with additional materials.

Now, I'm looking a bit at the Ministry of Energy and my comment here. I do have a high regard for Kendall Fontaine(ph) and Bruce Matson's report and so a number of their comments are very similar to the comments that I'm making in this submission and in their written submission. The sensitivity analysis shows that significantly higher seepage rates than used in the water quality loading models could occur. So I've kind of taken that into account. A key uncertainty of the review has been identified. Taseko has not shown that the existing natural till can be sufficiently enhanced over the large

TSF area for the proposed design level of this hydraulic conductivity. SCA finds that with no adequate TSF liner, the project may pose a great environmental risk for the Province of B.C.

The next thing is this ore, low-grade ore seepage issue. I brought it up a little bit earlier in terms of not understanding the model, but I was going to make a few more comments that the Ministry of Energy and Mines also discussed. So a portion of the seepage from the ore stock pile will discharge to Fish Lake bypassing the composite liner and this is explained in the response to IR50. The seepage model has incorporated unrealistically low seepage rates which are based on low head and low permeability material below the base of the liner. So this does come from the Ministry of Energy and Mines again. It's very difficult in my experience in modelling seepage liners and in being aware of other consultant's work to achieve 99 percent effectiveness with an installed liner. So Ministry of Energy and Mines commented that the liner is -- the effectiveness of the liner is overly optimistic from an effect assessment perspective. I would like to add that the ore

pile assumptions are not conservative and result in under predictions in the mass loading rates to Fish Lake.

Okay. The long term water management has been discussed in this project as well, and fresh water diversions and flow augmentation have not been applied at B.C. mine sites at this scale or for this length of time. Taseko is making very significant commitment to long-term recirculation to preserve ecological value of Fish Lake. It's a very large undertaking. Perpetual pumping should be assumed for a number of streams, the main dam seepage, ground water recovery, recirculation of Fish Lake and seepage collection from the south and west dams.

The mitigations represent significant long term liabilities that have to be covered by a very large financial security. Again, just echo that I appreciated the comments on this from the Ministry of Energy and Mines.

In terms of accidents and malfunctions, the risk assessment conducted did not consider these in relation to mitigation measures from maintaining Fish Lake such as

recirculation and aeration. And accident and malfunctions related to the water treatment of TSF seepage were not considered. These measures are the primary mitigations for the project and any accidents or malfunctions related to them could have direct effects to Fish Lake. In my professional judgment, this is a critical error of the impact assessment of the risk for the project.

Now from the perspective of the overall project rather than specifically Fish Lake, the Pit Lake discharge did stand out to me. Once the Pit does discharge, the concentrations in Fish Lake are predicted to be relatively high. Higher than Fish Lake in the .35 microgram per litre level for cadmium as my example. A number of other parameters are also high. I'm concerned this will cause impact to lower Fish Creek and possibly Taseko River. I know there's a proposal to treat, but the effects of the treatment have not been modelled. The lack -- so I think even just having the treatment capacity and the cost of that would be helpful. The lack of detail conceptual plans to mitigate Pit Lake discharge in Lower Fish Creek in Taseko River is of real concern for the Panel's assessment of the proposed

projet.

Now, overall another thing that really stood out was the financial security. And not withstanding that, the conclusions are that treatment is not technically feasible for Fish Lake. The total treatment proposed by Taseko is a significant long-term cost. So there's treatment of water, pulling water out of Fish Lake for recirculation. There's treatment of long term Pit Lake discharges. There's treatment of seepages collected. I'm imagining the seepage is collected. And there's the additional discharge as to water bodies that could also require -- so all in all, it's a lot of treatment.

The combined rate of treatment required to meet water quality guidelines and thresholds for all the COC's in the receiving environment was not described by Taseko. The cost of treatment along with recirculation may be economically unfeasible for the project.

Now that I've gone through those mitigations, I did look briefly at the water balance. So in particular, this is another area of expertise for myself and so I wanted to consider this key question: Could the NRCan TSF

seepage estimates result in exposed tailing in the TSF?

So, from my understanding, total, this isn't just the main dam now, but in total, we could have up to 116 litres per second seepage from the TSF.

So SCA evaluated the effect of the change in seepage using an annual water balance presented for the TSF pond. And I didn't mention it earlier, but the water management report from NP was very helpful in terms of the annual numbers. That's where I pulled all the numbers from for the original water balance and this is where I also got the numbers for this water balance cover assessment. So that's the back of the Appendix Water Management.

The TSF Pond is predicted to have a water deficit for the upper range of the TSF seepage results. Details of this analysis are provided in the written submission that SCA provided. This analysis does not consider the site-specific historical range as well. I was only looking at mean results, mean annual results not -- all it is to say is that it could be conceivably in a low flow year, it could have an

even larger deficit given the a high range of TSF seepage. The water cover the tail and waste rock is a critical mitigation required to prevent onset of acid rock drainage.

Another -- this is the last issue that stood out was lower Fish Creek. There are some salmon present as I understand it. Lower Fish Creek is suitable in June, not necessarily year round. The EIS predicted increase in service water flow in lower Fish Creek of 76 percent during operations and closure. For the first part for approximately 50 years the flows are drastically reduced. However, at post closure then the cadmium concentrations start to be very high. So this appears to pose quite a serious risk to lower Fish Creek taken all together. This just gives an example of the predicted levels from the Knight Piesold appendix water quality modelling of cadmium levels. So the Fish Creek levels are remarkably high.

Just as a general statement to the Panel, in my opinion, the industry standard is to model the mitigation proposed, not propose mitigation and leave it to the imagination of the reviewers to find out how well that mitigation

would do. So I would like to say that I in my experience, the proposed mitigation is modelled. It's not level to these high exceedances. If you're going to say you're going to meet water quality guidelines, then show with your model that that's the case.

So, in conclusion, the Fish Lake water quality modelling, the SEA model results show that water quality guidelines for cadmium in Fish Lake can't be met with the proposed treatment. Even with a hundred percent recirculation directed to treatment, Fish Lake cadmium levels continue to be above B.C. water quality guidelines for the prosection of aquatic life. SEA used the base case seepage from NRCan as opposed to the conservative case and used all the assumptions from the EIS in terms of seepage capture and used overly optimistic 99 percent liner efficiency and we still came up with this result.

So in the opinion of this water quality modeller, the results could be a lot worse. Water quality concentrations of cadmium in Fish Lake could be much higher -- this is the point I've just made -- because of nonconservative

nature of the both model that I put together and the SRK water quality model.

In terms of mitigation, the following plans are of concern, in particular the ore and low-grade ore stockpiles have been modelled optimistically. The TSF seepage liner composed of native till isn't adequate for mitigating the effects of TSF seepage on Fish Lake. The long term recirculation and seepage comeback are onerous and need to be maintained in perpetuity. This is not something that I'm seeing on the projects that I'm reviewing and working on for the mining industry. Failures of the recirculation and seepage pump back systems weren't considered in the accidents and malfunction section of the EIS posing a significant risk to Fish Lake over the long term.

In terms of treatments, the treatment requirements the project could include a number of different streams, Fish Lake, Pit Lake discharges to lower Fish Creek, seepage pond water collected and other mine discharges. Overall, this amounts to a very large amount of water to treat making the cost potentially prohibitive. A substantial environmental and financial risk to

the public would arise if the project were to proceed as designed.

Overall, adequate mitigation plans for dressing potential impact to Fish Lake water quality were not provided by Taseko. As Taseko does not intend to construct an adequate liner system to prosect Fish Lake, it is not possible to conclude that the risks to Fish Lake are acceptable. Thank you.

CHAIRPERSON ROSS: Thank you, Dr. Freed. As I understand, we'll now take questions for Dr. Freed.

Government of Canada, any questions for Dr. Freed? I see some negative shaking of heads.

I'll move on to other First Nation questions of Dr. Freed?

Seeing nothing exciting happening, I'll move on to interested party organizations?

Interested party individuals?

Taseko?

MR. JONES: Mr. MacGregor has a few questions.

QUESTIONS BY MR. MACGREGOR:

MR. MACGREGOR: Dylan MacGregor. Thank you very much for your presentation, Dr. Freed. I have only a couple of questions and they're in no particular order so I'll just get started here.

I'm going to make a reference to your written submission so that's the registry document No. 708. And it's just a point of clarification, I think it's important for the Panel. On page 19 you make reference to there being an ARD potential for the tailings, and I'm just wondering what the basis of that was, the test work that I'm familiar with doesn't indicate that.

MS. FREED: Thank you for clarifying that. In particular, then I suppose it's the PAG waste drop that would be of concern. You're saying that tailings don't have potential for going acid if they're exposed to air and water, right?

MR. MACGREGROR: That's what the test work and the application show.

MS. FREED: Oh, I said thank you for the clarification.

MR. MACGREGOR: Okay. Thank you. In your presentation there I suppose I have to ask this in the form of a question so I'll ask if you've read a number of different things. In the application itself, in the EIS document, I'm wondering if you've read the section on Page 494 that says under a heading, "Ore stock pile source term" and goes on to describe the ore stock pile source term.

MS. FREED: Thank you, I have.

MR. MACGREGOR: And references Appendix 2.7.2.1-E which has the numerical. So the section in the document describes the derivation of the source term and the appendix contains the numerical values for the source term, and it's titled Mine Rock Source Term Inputs.

MS. FREED: Yes, I believe I've read that. Thank you.

MR. MACGREGOR: I think this is my last question. I have a number of things that I jotted down, but you've clearly done a lot of work in developing this model that you put together. I think it's probably fairly characterized as a verification model or an audit of the work that was in Taseko's document. I

wonder why you chose cadmium in particular at a parameter that is in all of the source terms in fairly low concentrations and we were seeing a number of sort of sub-microgram per litre numbers in your presentation. You pointed out that you had converted to microgram per litre to make it easy for people to follow. I'm wondering why you chose cadmium in particular to develop the model with, given that it is kind of odd level model of verification, wondering why you didn't chose to use something more of a major ion like sulphate, for example, to really build your model around and use something that wasn't so susceptible to influences from low detection rates, for example. In my view that would be a standard way to do this kind of thing.

MS. FREED: Thank you for the question. I did actually -- the first part of the question is was this a verification and my intention here was I didn't have enough information to verify. My intention more was to test the statement that the treatment would meet the water quality guidelines. So I guess it isn't in my opinion a verification model per se. I didn't have enough information to verify the

model. I was more using the same assumptions that were used in the modelling as far as I could gather to test the statement about the treatment.

But on the other question about cadmium and why I chose that. I actually chose sulphate to begin with. That was my initial thought. So I did all the modelling with that, presented to the TNG and the comment I got back is we don't care about sulphate, can you pick something that's a little more concerning.

And then I will take issue with one thing that you said about cadmium levels being low. We went up to 6 milligrams per litre; do you consider that low for cadmium?

MR. MACGREGOR: No, I don't consider that low. The general sort of sub-microgram per litre concentration that were discussing in your presentation I would consider low.

MS. FREED: They are above the water quality guidelines, and I think we'll have presentations from TNG stating how they can be toxic at that level.

MR. MACGREGOR: I'm sure we all look forward to that.

MS. FREED: Thank you.

MR. MACGREGOR: I don't have any further questions. I don't know about the rest of the Taseko party.

CHAIRPERSON ROSS: Thank you very much, Mr. Jones, Mr. MacGregor. I think it's the Panel.

QUESTIONS BY MR. KUPFER:

MR. KUPFER: Since you've done this on other occasions, that is the question I was requesting to ask, why cadmium? So and I'm sorry, I didn't quite understand the full exchange that took place there. Would you please reiterate why you chose cadmium? Did you try anything else or are you charged to do anything else? But first of all, will you please repeat that again.

MS. FREED: Yes, of course. Thank you. I did start out the modelling exercise looking at the TSF for water qualities and it struck me that 2,000 milligrams per litre sulphate seemed high. So I'll look at sulphate. It's not conservative in the sense of solutransport. It doesn't attenuate or anything. And so after I had done that presentation for my client, the TNG, I was asked -- I mean, I didn't want to model every,

single parameter. I'm not working for the mining company. I'm working for the First Nations here. So I thought I'd find an example, see if works. And after I looked at sulphate, there were exceedances, but in any case the comment back to me was, Well -- from some of the ecologists -- well, we're not as concerned about sulphate. Maybe it is still of concern, I don't want to put words in anybody's mouth. But they wanted me to chose a metal that might be more toxic to rainbow trout. I didn't necessarily consult with them which would be best but I had to pick one to follow through.

MR. KUPFER: You said two ecologists -- that was the word you were using -- you consulted they had a more ecological concern and cadmium fit that better?

MS. FREED: Yeah, but it was more of a harm for the fish than the sulphate. Exactly.

QUESTIONS BY MR. SMYTH:

MR. SMYTH: Thank you for your presentation. A lot of work. You listed a number of other COC's that would be of concern. Can you comment on any of those, which ones you might rate

in order?

MS. FREED: I would like to say that I appreciated the comment from Environment Canada on this topic, and as I was looking through the comments and also when I was doing my review, I thought that selenium stood out especially from the Biotech proposal because that treatment level barely changed the water quality and it wouldn't, I don't think, help meet the water quality guideline in Fish Lake.

But I'm going to defer to the presentation by Don MacDonald tomorrow because it's more within his specialty than in my own, if that's okay with you.

MR. SMYTH: In your work one other mining projects, adequate liners -- what would you consider an adequate liner for this project?

MS. FREED: I happened to work on the (INAUDIBLE) and in that case there was engineered liner proposed and it was accepted after the EA process. And I know it's a smaller scale mine and for this low grade ore -- there's an underground mine -- for this low grade ore deposit it's not necessarily standard; however, I

don't see how in my professional judgment this project can proceed without some sort of restriction on the TSF seepage problem.

MR. SMYTH: And are you thinking liners on the embankments or on the foundation or both?

MS. FREED: I think he said the Tsilhoquot'in project it was the liner on the foundation.

MR. SMYTH: I'm talking about this project.

MS. FREED: In this project, I'm not being asked by the mining company to come up with mitigation measures, and I don't think my client would necessarily like me to try to solve the problem. So it's not necessarily my job there.

MR. SMYTH: All right. You posed the question why the seepage collection ponds would have different values of cadmium in it and the company didn't respond. I had the same question, you know, if you're reporting different numbers of cadmium in two ponds downstream at the same TSF, I'm wondering -- maybe you don't have to comment now but maybe later -- why you are

reporting different numbers there.

MR. JONES: We'll take that as an undertaking. We don't have it right now.

QUESTIONS BY CHAIRPERSON ROSS:

CHAIRPERSON ROSS: Thank you, Mr. Jones.

In your model for cadmium, I think I got it off a slide, but I'm not sure -- what's the baseline? What is the cadmium concentration of Fish Lake today?

MS. FREED: Well, the baseline characterization was not necessarily done all that adequately because as far as I understood it, the detection limit was set far too high and so it was always getting detection limit and then they reduced the metal detection limit I think in 2006. I'm just really paraphrasing what I recall from the Knight Piesold water quality report. And so the modeller there took the approach of using .025 microgram per litre cadmium as the baseline -- that's what I used as well -- and that was -- because that was the highest value that was ever measured on site, not necessarily Fish Lake. And because that I think reflected half the detection limit used in the past. That was the best I think

they could do.

CHAIRPERSON ROSS: That's good. I was just interested in what you used. That's fine. You said .028 micrograms per litre hardness dependence was the B.C. guideline. Earlier on, I asked about water quality guidelines and was told that at some time in -- if this mine proceeds -- at some time in the future, the government of British Columbia would prescribe an -- I hesitate to use the word guideline, but I'll do it any way -- a guideline for cadmium for this particular site. For other mines that have gone ahead, the .029 micrograms per litre commonly used?

MS. FREED: In my opinion, I'd like to answer the question a little more fully than just a yes or no. First of all, I wouldn't necessarily agree we come up with these site-specific water quality objectives for every parameter. For example, in the case of -- I picked on Tsilhqot'in Chief last time -- but in the receiving environment we had exceedances of the water quality guidelines because of baseline conditions.

So in my experience, the most common reason we develop site-specific water

quality objectives in the province of British Columbia is so we can deal with that instance where baseline is higher than the water quality guideline.

So what I do when I assess impact for water quality predictions is look at what is higher; is base line higher or is the water quality guideline higher? If baseline is higher, then that would be a need for site-specific water quality objective.

Now, in many mines we have mineralization affecting water quality, and so --

CHAIRPERSON ROSS: Sorry, I missed that. We have?

MS. FREED: We have the case that the baseline water quality exceeds because it's in mineralized areas. It's very common. However, in this project I haven't seen any evidence of that. I've just seen fairly soft, very good water quality. So I don't see a real basis for that type of site-specific water quality objective.

Now, there are cases, some mines where you might get a higher --

CHAIRPERSON ROSS: Sorry, if

there is no exceedance in the baseline, then what would the government of B.C. use for a water quality --

MS. FREED: This is what I'm saying. Typically they use the water quality guideline method.

CHAIRPERSON ROSS: And the water quality guideline is .028 micrograms per litre for cadmium.

MS. FREED: For this hardness level, yes.

CHAIRPERSON ROSS: For that hardness level?

MS. FREED: Yes.

CHAIRPERSON ROSS: That's what I was getting at. Thank you.

I don't have time for that question and it was a little peripheral. So let me move on to water balance concerns. I'm not a mine planner, mine engineer but I would have thought that if I had a tailings pond that I needed to keep full so I would protect my PAG material and it was getting a little low, since I've got a pump there that's pumping in perpetuity, I'd crank it up a little bit.

Wouldn't that be a simple mitigative measure to deal with that concern? The pumping from ground water that's coming up, couldn't I do that?

MS. FREED: Well, I guess first of all, I don't think that it's my job to necessarily come up with the mitigation, but since you're asking me I guess I have to think that through. I have seen an example of the Red Dog Mine in Alaska where I saw tailings high and dry exposed. And so I think it can happen. But it's just not possible with the hydrologic range of water conditions that you are able to allow at least certain times of the year much water to accumulate because you might not have enough space. This is a different issue, mind you.

In terms of the recirculation, I'd have to look it into it. It wasn't my objective to see if I can solve the problem. So I think it's possible you can solve that problem through recirculation. However, you need that water to maintain the fish and inlet streams for spawning. So you have to have a balance there.

CHAIRPERSON ROSS: What about the pump back wells. Could they be ratcheted up?

MS. FREED: I think the pump

back wells at closure do not go back to the tailings pond. I think they go around to the pit lake and they bypass the Fish Lake system, because at closure the plan is to discharge water from the clean TSF pond into Fish Lake. I don't think you'd want to put that fairly nasty water up into the TSF pond, but that would be a Taseko decision.

CHAIRPERSON ROSS: Thank you so much. We have no further questions for you. So we can move on to your colleague.

PRESENTATION BY JAMES KUIPERS:

MR. KUIPERS: Thank you, Mr. Chairman, members of the Panel, members of the audience. My name is James Kuipers. I'm a consulting engineer, the principle consulting engineer for Kuipers and Associates based in Montana. I very much appreciate the opportunity to talk with you today about this project.

CHAIRPERSON ROSS: Mr. Kuipers, just because I managed to mangle the pronunciation of your name earlier, could you spell it for the court reporter.

MR. KUIPERS: Absolutely. It's K-U-I-P-E-R-S, and no problem there. That happens regularly.

Let me start by just giving you a bit of information on my background that might help you appreciate the perspective I'm coming at this from. I actually grew up in a mining family. My grandfather had me working underground with him when I was 12 years old. When I was 16, he basically had me as a driller, hucker and blaster. I had other ideas for my education, but he decided that we needed a mining engineer in the family, so quite bluntly I became a mining engineer. I graduated from Montana School of Mines with specifically a degree in mineral process engineering. Also have spent quite a bit of my time working the mining as well as mineral processing and metallurgy sites.

If you step back to 1983 when I entered the mining industry as a professional, the industry really didn't have environmental engineers yet. We were just beginning to take on the discipline of environmental aspects of various sites, and it was typically left to those of us with the analytical chemistry sampling and other backgrounds, in my particular case that of mineral processing engineer, to address environmental facets.

During my career with the industry, I moved from basically a metallurgical position to that of mill superintendant, eventually project manger, and then as a senior technical person working for a corporation Angle-American, which is one of the world's largest mining corporations. I worked for Angle-American for seven years. And then I also eventually went to work for Denver Mineral Engineers, a fairly large consulting and equipment firm, as their manager of process engineering from 1992 to 1995. I think it's very pointed to note that this was the era in which mine water treatment really began to be looked at as a very significant science. Essentially began to realize in that era that mines were going to pollute and we were going to need to effect treatment, both in terms of source controls and actual pumping and active treatment at many different mine sites.

In 1996 I made a conscious decision -- actually 1995 -- to take a year off from the industry and decide whether or not this was the type of activities I wanted to spend my endeavours on. When I came back after a year off, I was approached by a number of different folks to

see if I might have an interest in supporting the environmental community on mining issues. And I chose at that point, quite honesty what I thought would be a one-time job on a very controversial mine in Montana to work for the environmental groups in the state and consider trying to address the issues they were raising. That was 17 years ago. I can tell you that that wasn't just a one-time job. From 1996 to about 2001, I primarily worked for environmental groups in the US.

In 2001 I began to transition a lot of that work to State, Tribal and federal government work and since 2006 --

CHAIRPERSON ROSS: We're soon going to get to New Prosperity Mine?

MR. KUIPERS: Yes. Since 2006 my primary work has been for government, and in that work for government presently, for example, the US/EPA, I'm reviewing all the different environmental impact statements that are produced in the US under the National Environmental Policy Act.

I've also been recently contracted to rewrite the United States EPA's acid

mine drainage prediction technical report dealing with the type of issues that you're discussing here.

Also I work for the Selkirk First Nation in the Yukon as well as Little Salmon (Native word) working on the, for the Selkirk Nation, the Minto Mine, which is an existing mine, and this will all come back to relevancy to New Prosperity in a minute.

In 2006, I was the author of a major report that came out. And really it's the only report of it's kind where we compared the predicted water quality and environmental impact statements with the actual water quality. And a very important thing we do as scientists is comparative studies. As we all know, there's all kinds of talk today about the predictions for the mine site. What's important to recognize is predictions and reality are oftentimes two very different things.

The 2006 study -- we actually reviewed over a hundred different environmental impact statements -- we found 25 of them that had adequate data that would allow us to look at the predicted versus actual water quality. It's very

important to know that in essentially all those cases where we had abundant water and a high contaminant leeching potential, and I would characterize this site as having both those characteristics, very near adjacent water to the sources and the sources themselves having significant contaminant leeching potential.

Essentially in all cases, the predictions under estimated the actual impacts. And the impact in almost every case resulted in significant exceedances of those predicted water quality outcomes. Now, when you look at what the major cause and effect of those inaccuracies was or were, it's very important to note there were 3 different primary factors.

The first was adequate geochemical characterization. So in terms of assessing the contaminant leaching potential -- and you heard our witnesses talking about that previously -- it's very important that you estimate that conservatively and that you recognize that that contaminant leaching potential is what drives these various water quality issues.

So a very adequate, I'd say very robust geochemical characterization program

is an absolute necessity if you wish to have accurate predictions.

The second aspect is hydro geological characterization, the way the water flows between the pathways and the receptors determining what kind of flow rates you're looking at, what the availability of water is, various things like that.

A site like this where a tremendous amount of mitigation depends on the ability to manage water, and I will suggest to you it can be managed at least from a technical perspective, but it requires that you understand the water. That you know how it flows; where it flows. When we talk about capture, it's not just a simple thing of putting a well in the ground, but you actually have to have the ability to find where that water is, where it's flowing's through various flow paths and other things. And one of the things we have learned the hard way is there's preferential flow at mine sites; and while we might think it might be dispersed homogenous flow, and essentially it's being modelled as that, in fact, it's the preferential flow paths that result in a lot more water moving a lot more quickly

which are most important to identify.

What you also have to realize is that it's this characterization of the geochemistry and the hydro geology that leads to the third factor, and that's the proposed mitigation.

It's really that combination or that entire per diem, if you will, of adequate characterization that allows you to ensure your mitigation is adequate. And I would suggest mitigation adequacy is not just in terms of the physical reclamation and closure plan, but also the financial resources to back up that plan and carry it out in perpetuity if necessarily.

When I look at the New Prosperity Mine in particular and the characterization deficiencies that have been identified by my colleagues today and previously as well as will be identified tomorrow, I really see the characterization deficiencies at this particular project as representing a critical key flaw in the project proposal.

What that means is because we've underestimated the risk by not really vetting out the characterization, in turn, we've

underestimated the required mitigation. And I think you've heard that discussed how it may that we're pumping 400 litres per minute, but there's other discussion it may be 4,000 litres a minute. That's a big difference when it comes to actually managing a mine site, as I'll explain further.

A couple of keys things that I want to address, and I'm very respective of your time so I'm not going to read off of my report, but rather get to what I think are some of the more succinct issues that I've heard discussed here.

The first is in terms of the precedent of this mine site. When we talk about reclamation and closure plans, mitigation plans at various mine sites -- and I might just for now stick with North America, the US and Canada as an example. While there are a couple of other sites I'm aware of, proposed sites, that might have the degree of water management, treatment and other various mitigations required, this site is unique in that it would require one of the most onerous water management aspects that I've seen.

Now, I don't disagree with the Proponent that we certainly as engineers, as

miners, we know how to pump water and yes if we need another pump, it's not that difficult to put it in. But there's two things: You have to be there to do it and you have to have the money to do it. And in this particular mine's case, what's very important to realize is we're not talking about in 50 years or a hundred years, we're talking for a thousand years or more. In my opinion, active mitigation at this site will be required to meet water quality standards. And I think it's very important to note that this is not an usual result for a major mine of this type.

Recently the Mine Environmental Neutral Drainage folks in Canada produced a water treatment report, and it's quite telling that we have over a hundred mine sites in North America alone that are actively treating water and quite probably will be for some time to come.

Another aspect I want to discuss is the water treatment proposal. I'm a water treatment engineer. I design water treatment plants, still to this day work very closely with a number of people on it. I'm also very familiar with Biotech and the work they've done previously and are doing today. And there's

a couple of key aspects that I think we need to look at.

One is simply that the history of application of water treatment systems to mine sites. The Minto Mine in the Yukon is a very good example. That mine was permitted approximately 7 years ago, has been operating since then, and it too had a proposed Biotech water treatment system that when the mine was permitted, it was proposed that that treatment system would be both entirely adequate to treat water, and also would be able to treat water to the baseline water quality standards at that site.

Well, two things have happened. Number one, the treatment system that was originally installed, originally projected for the mine site was inadequate. It did not include treatment for nitrate and selenium and didn't necessarily treat adequately for the copper and other things it was intended to.

The second part of it, though, is as we now look at the treatment system and what we need to go forward, it's very clear that rather than being able to treat to meet standards, the proposal at Minto is to change the standards and

to allow much higher discharges into the receiving environment.

I have a very hard time seeing how treatment can be reliable when it becomes a very common place thing once the water quality is determined to be less than what was originally projected to then rather than propose additional treatment, they actually propose changing the standards. And I think that is something we could almost anticipate happening at this site.

The other thing is that we have parts of the Biotech proposal that you might notice were labelled "proprietary." Now, some of parts of the proposal are labeled proprietary, such as the ultrafiltration, nano filtration step up front. I'll just be quite blunt and say that that particular application and approach has been used numerous times at other mine sites. I'm not sure why they have it labelled proprietary, but it always raises questions when that happens.

But I'm particularly concerned about their labelling of the selenium circuit proprietary. In my report, I actually cite a study by CH John Hill, conducted for the mining industry recently in 2010, and they

specifically -- the study is for the treatment of selenium -- and they specifically recognize that the treatment of selenium is extremely problematic, both technically and from an economic stand point. We simply -- and I deal with selenium at numerous mine sites. Nearly all the phosphate mines in the U.S. are now superfund sites dealing with selenium. It was mentioned how -- by Environment Canada -- how we're seeing more and more selenium at mine sites. Selenium is a contaminant concern at over 50 percent of the mine sites that I'm familiar with and it's becoming more and more a major contaminative concern. As a process engineer, I can tell you right now we have no proven viable technologies for the treatment of selenium, and if Biotech has a proprietary technology then they should come out. They should be using it. It should be quite popular out there treating these technologies. I don't see it and personally I have a lot of skepticism as to both the technical and economic viability of what is being proposed. Again, if they truly have something patented, let's come out with the facts of it instead of hiding behind proprietary.

The next thing I would mention is the adaptive management plan. Now I consider reclamation closure planning to require 3 different steps. The first and actually in some cases the most important step is failure modes effects analysis. As an engineer it's failure modes effect analysis that allowed all of us to fly safely here, and I expect to be able to fly safely home. The airline industry has made a real quality process of doing failure modes effect analysis and the key is when they recognize something can fail, they back it up; they provide redundancies. And so it's not just simply a matter of if it fails, we'll rise and fix it. No, They've actually recognized that failures, in order to keep the plane in the air need to have redundancies that already exist.

Now, what we keep hearing in the case of this company is we'll come in and add that additional measure or we can go get it in five weeks. I'll have to come back to that.

But when you look at real planning, what you do is you do a very strict failure modes effect analysis and determine what are the likely failures or high consequence

failures. You design your adaptive management plan around recognition of the those failures. The adaptive management plan that the company has put in front of you essentially says little or no likelihood of any failure. Well, bluntly they're not ready for the plane to crash and when it crashes, I think their plane might very well hit the ground. And the ideal mine-planning scenario would in fact have those redundancies installed.

The question was asked, what about the tailings facility; what would you do differently? I would put in a composite liner system that actually provided redundancies in terms of a primary liner and then a secondary leak detection and then the secondary liner beneath it. It won't result in zero discharge. Liners still leak. But the idea of a two-layer redundant liner is the type of thing I would expect to see in a well thought out mitigation plan.

Ideally what we would have seen, for example, in the failure mode effect analysis conducted by the company is they would hire an independent group of professionals with a high degree of experience to assess the mine site without bias. Essentially, what you have in front

of you is something that is highly biased, it's basically the mine says their going to succeed. I'm sure in their opinion they will and they will have no major problems. But a very good example of what I would include for failure modes analysis, and I think it's a very important scenario for you to consider, is that of early closure. Now, the reality is mining companies go bankrupt and they go bankrupt regularly. Mining is the only industry that I'm aware of where there are financial security requirements such as you would see discussed for this project. And the reason for that is essentially because we recognize the likelihood of the mines going bankrupt. It's part of the precautionary principle that you employ here in Canada and we employ elsewhere. During my career, 3 different companies I was employed by went bankrupt. Since I've been working basically on the other side of the fence, I've been involved in bankruptcy of Pegasus Gold, resulted in 13 different mines being subject to different bankruptcy proceedings in the U.S. primarily. I worked with the Asarco bankruptcy, and they say the big folks can't go bankrupt. Well, Asarco went bankrupt. I think

the US EPA got maybe a hundred million out of 2 billion that they estimated they needed. I've dealt with a number of recent bankruptcies.

And so one of the things we predicate mine planning on is that potential for them to go bankrupt. If the company were to go bankrupt mid-stream, and again I don't wish this on the company, it's not something I wish upon anybody but it's reality, the commodities prices go up and down. If they were to go bankrupt at such a time as the ore stockpile was in place, as the low grade stockpile had yet to be milled because that's going to be milled at the end economics provided -- if that were left in place the tailings facility, for example, would not be fully built out, the pad would not be placed. You'd have a mine site that the plan required perfect execution and halfway through that execution, suddenly it's entirely possible for the mine to disappear, the mine operators to disappear.

At that point, you would be entirely dependent upon the financial security and the ability of the government to carry out the various aspect that have been explained.

Certainly the government can run a mine site if they have to, but their not the mining company and it's not their business to generally do that, and I think the success of them doing so would be questionable.

The real concern I have, though, is even if that did happen that the money would essentially run out. As you look at the plan, number one it's very optimistic so the ability to actually have the monies in place to buy the additional pump and to put the additional people at work to potentially do water treatment, it doesn't appear to be there. Even if they had estimated it properly, and that might mean an order of magnitude more effort than what's been imagined; order of magnitude more money than what's been imagined. Let's say they have allowed for that. You still have the issue of the financial security only lasting for a given amount of time. Financial security is based upon typically in British Columbia, my understanding is a 3 percent debt discount rate. So a 3 percent difference between inflation and what you're collecting in the bank. So you place a trust fund in the bank for the benefit of the government in

the event the company goes bankrupt. But if your inflation rate goes up and you don't get a return, that fund could be gone in as little as 30 years, might last 70 years. It's only intended to typically last 100 years. And even if it's an in perpetuity account that might go further, it's still subject to that issue of discount rate.

So my point is, without the plan and without the funding to assure what the company's proposing, you can't be certain that what they predicted would happen even if one were to accept their underestimation, in my opinion, of the various aspects here.

Just a couple of other things. There was a question about responding to an exceedance and I found this very interesting from the Panel. I've been involved in a number of different mine site. For example, we're bankrupt, we're the government that was operating them. I also work at a large number superfund sites and the suggestion was made by the company that ideally they would see the trend of water quality changing, it might take four years and they have four years to kind of respond and adapt to that change. But the question was posed, Well, what if

it was much more quick? And I can tell you that in my experience, it typically is something that when you start to see water quality effects in the environment, they oftentimes do move relatively quickly.

Well, the suggestion was made they get a treatment plant on site in five weeks. Number one, I would tell you that I just can't believe anybody would make that suggestion. There are no off-the-shelf, ready-to-go water treatment plants built just for Taseko sitting there not being used. The additional thing is, you know, maybe if it was a 400 litre per minute type application. I've actually supplied on very short notice reverse osmosis systems that are about 400 litres per minute. We're talking potentially needing 4,000 or 8,000 litres per minute. That's not a five week off-the-shelf application.

In fact, I just have gone through an exercise with Chevron Mining Corporation on the Questa Mine in New Mexico where we discovered that they had a very significance discharge issue from tailings impoundment and it was causing water quality exceedances. And the result that we came back with just in a meeting

this last week with the company is it will take two years from now for them to pilot, design, build, and ultimately operate a water treatment plant of sufficient capacity and sufficient sophistication. And I pose to you that that's the case here. And then they need a one year shake-down period before they expect to meet water quality standards.

So maybe in a very, again, ideal circumstance they can get something there in five weeks. I have my doubts about that. I can tell you in the more likely circumstances of something larger, more sophisticated and other things, it could take them 3 years during which time there could be exceedances of water quality standards while they're getting their mitigation in place. And in fact it's -- I'm not saying we can't mitigate it, but I am saying it's not something you do instantaneously and particularly if your plan did not contemplate it happening. A better plain might be for them to propose to have the water treatment in place and if they don't neat it great, rather than suggest we'll be able to provide a miracle at the last minute.

And I really think in the

interests of time, that's -- I'll conclude my presentation.

CHAIRPERSON ROSS: Thank you very much, Mr. Kuipers.

Government of Canada? Any questions for Mr. Kuipers? I'm not seeing anything.

Any other First Nations? Interested parties? Not seeing any.

Any interested party organizations? Not seeing any.

Any interested party individuals? I see Mr. Gustafson going over because he knows he's next on the list.

Mr. McManus?

QUESTIONS BY MR. MCMANUS:

MR. MCMANUS: Thank you, Mr. Kuipers.

John McManus, I'm a mining engineer too, by the way. I was taking a lot of notes and I have questions in no particular order other than as they came up. So I will try to work my way through them.

One the things you mentioned was in the 2006 report that compared predicted to

actual exceedances that there were 100 environmental impact statements to be looked at where the 25 percent of those exceeded the predicted levels.

MR. KUIPERS: No, I'm sorry. Let me clarify. We looked at over a hundred different environmental impact statements. We had 25 in which we were able to obtain the data necessary to conduct a case study where we actually had predicted versus actual data.

MR. MCMANUS: Thank you. Can you tell me what time frame those predictions were made in?

MR. KUIPERS: Yes. Those predictions were made -- the range and time is anywhere from mines that have been permitted beginning in 1979 to mines have that been permitted through the period of about 2004. The Pogo Mine in Alaska would have been the most current mine.

MR. MCMANUS: What percentage of those 25 exceeded their predictions?

MR. KUIPERS: In the case of those where there was close proximity to water quality -- excuse me, close proximity to water

resources and high contaminate leaching potential, I believe essentially 87 percent or better.

MR. MCMANUS: Exceeded?

MR. KUIPERS: Yes, resulted in exceedances.

MR. MCMANUS: You also mentioned that knowledge of environmental aspects has evolved quite a bit since the 1990's.

MR. KUIPERS: I don't know that I mentioned that, but I wouldn't disagree with that statement.

MR. MCMANUS: Yeah. You did say that, and I agree with you. So some of these 25 obviously were -- the predictions were made with a much lower level of ability to predict than current?

MR. KUIPERS: They were made with different approaches, and, yes. The different state of the science, yes. It's important to know because I think I understand where you're going. We actually did a comparative study to take a look at the difference between mines permitted early on if you will, say, for example, I believe between the period 1979 to 1990 and then we looked at 1990 to about 95 and 95

forward. What we essentially saw, though, were the same issues in terms of underestimation throughout the different periods. While the techniques have improved, the utilization of that information in terms of having it tell us we need to take more samples, better samples, do the proper analysis in fact has not been recognized by industry and practice. So while in concept one would expect that the ability to make more accurate predictions has improved, industry would need to take that information and adequately use it. And I'll just simply state that where you have very large mining companies with internal policies and other things, we have seen the substantive improvement in their practices, but it hasn't been in general with the mining industry and I would take a look at this project in particular and say at least in my opinion it does not represent the state of the art that would be preferred in terms of a much more robust approach.

MR. MCMANUS: Thank you. We've discussed that in other areas so I'll leave it alone.

You also said that one precedent on this site -- and I don't know why

it's precedent -- but in order to run a management of the system, you have to be there to do it and you have to have the money to do it. Have you encountered a lot of other sites with a proposal like this where the collection and the pumping system is established at the beginning of the property? So those costs of establishing the treatment is already there, other than the treatment plant itself?

MR. KUIPERS: I would note that I have noticed that same aspect in nearly all proposals have you noted I've actually asked the question that in a bankruptcy situation, that equipment would be owned by the bankruptcy court and the trustee, and in fact would not be available to the company -- or to the regulators to operate without them essentially purchasing that equipment or otherwise coming to agreement with the trustee.

MR. MCMANUS: That depends on how the bankruptcy occurs and the security that the government has and we're going to get clarification from British Columbia on that. They do not in a bankruptcy have access to that security. That is primarily for -- in the case of

default, the protection of the environment. Just a clarification. Sorry. That's not a question. I'm sorry. Stop.

You used Minto as an example of a Biotech treatment that did not work 7 years ago. Do you have a ratio of success to failure on treatment plants?

MR. KUIPERS: No, I do not.

MR. MCMANUS: Okay. Now, I'm not sure on the timing of this and I'm putting these questions together so I'm not trying to trip up, but Biotech told us they provided within 5 weeks a plant to Minto which was able to treat 8,000 cubic litres per day; were you aware of that?

MR. KUIPERS: I'm not aware of 8,000 litres per day. I'm familiar they ended up supplying a reverse osmosis system that essentially is creating a large amount of brine that hasn't been addressed in terms of how that will be dealt with.

MR. MCMANUS: We have a source that says that's correct.

Do you know when selenium became a contaminant of concern and when people

started working on treatment systems?

MR. KUIPERS: My first knowledge of people working on treatment for selenium, I actually worked on it going back to the 1980's.

MR. MCMANUS: Okay. You mentioned the case of a bankruptcy of a mine of this sort. Can you tell me what typically happens over the long term if the mining that built the mine goes bankrupt, what becomes of the property?

MR. KUIPERS: What becomes of the property?

MR. MCMANUS: Yeah. What becomes of the project, usually?

MR. KUIPERS: Let me give you the most pertinent example I can and that was when Pegasus Gold went bankrupt, and I was actually at the Zortman Landusky mine site the day that happened. And I should say the original bankruptcy was a Chapter 11 reorganization, or 7 reorganization and they went into a Chapter 11 foreclosure later. Initially, when the company first went bankrupt, the funding was thought to be something that could be negotiated. But literally as Pegasus went bankrupt, they called their

employees, they said, You're out of work. You're done. We're closing the gates.

Fortunately, the regulators, Montana Department of Environmental Quality and the U.S. Bureau of Land Management were at the mine site. And when they were told that essentially operations were closing, they were shutting off the pump and the employees were abandoning the site at the management's direction, the state and federal agencies hired the operators as they left the gate. They actually made a phone call and said, Can we do this? And received permission from their superiors to do so. They hired several operators at the site and we fortunately managed not to spill any water and to continue the operations at that site. That was extremely fortunate. But the reality is that when this happens the company no longer exists, essentially right then, and it becomes the responsibility of the regulators and they have to have both the know how and the financial ability to run these operations.

MR. MCMANUS: I think we'll hear from the Ministry of Mines on how that works in British Columbia. But I've been working in

this province a long time and seen companies go bankrupt, and I can't think of any instances of a premature closure of the mine where eventually another company does not come a long and purchase it for whatever cents on the dollar and brought back in to production recently.

MR. KUIPERS: If the Panel would care to here, I can give you a dozen cases where, in fact, there has been no company come back in. Just stick with the Pegasus example. At Zortman Landusky here was still well over a million ounces of gold in the ground. There was a very modest attempt by a contractor to come in and make some money. After six months, it was realized he was actually loosing money. That was 1998. It's 2013, 15 years later, nobody has bought that mine to open it up to mine the remaining 1 million ounces.

MR. MCMANUS: That was in B.C., sir --

MR. KUIPERS: No, this was in the U.S., in Montana. For example, I haven't heard of anybody proposing to re-open Farrow any time recently or Giant Bay any time recently.

MR. MCMANUS: Actually Farrow

went through a re-opening. They closed prematurely and then they were bought by Kira and re-opened.

MR. KUIPERS: And would you care to explain what the environmental liabilities on that site are today.

-- (speaker overlap).

MR. MCMANUS: That's a historic site. I know there was problems. I'm aware of that. This is 2013.

MR. KUIPERS: The problems still exist in 2013.

CHAIRPERSON ROSS: Could we move along with the questioning, please.

MR. MCMANUS: Yes. Sorry.

CHAIRPERSON ROSS: The comment was not directed to you Mr. McManus.

MR. MCMANUS: Thank you very much. That was my last question. Thank you.

CHAIRPERSON ROSS: Anything else from Taseko?

The Panel?

QUESTIONS BY MR. KUPFER:

MR. KUPFER: From your experience, and you have some Canadian experience

I noticed as you been through, but not extensive in British Columbia.

MR. KUIPERS: Well, actually I should mention that I worked in British Columbia back beginning back in the 1990's and in fact I was part of a company called Costech Research out of north Vancouver for a couple of years. So I've actually worked at Red Lake. So I have experience from an operations and management stand point prior to 1996 in Canada and then a fair amount of experience off and on with mines in Canada since then.

MR. KUPFER: Thank you for that addition.

Do you think could a company or a community protect themselves by having treatment options prepared ahead of time?

MR. KUIPERS: That certainly would be an improvement and one way to ensure that if it becomes necessary, it's available. And I might mention that I think an adaptive management plan that starts with active treatment and then allows for, if you will, not use using that treatment depending upon the monitoring results would be a more preferred precautionary approach

to this type of situation.

MR. KUPFER: Thank you.

CHAIRPERSON ROSS: I believe the Panel has no further questions. And so I thank TNG for it's presentations. Thank you very much.

The next presenter we have is David Williams, Friends of Nemiah Valley.

Mr. Williams, go right ahead.

PRESENTATION BY DAVID WILLIAMS:

MR. WILLIAMS: Thank you Mr. Chairman. I'm not a water quality expert. This is a more terrestrial and general statement I'm making today. (Native being spoken). Good afternoon.

First, I would like to acknowledge we are the guests of the Secwepemc First Nations people here. This is unseeded territory, and they, like the Tsilhoqot'in, are the first occupiers of the land they have lived in since time before memory.

As I understand it a basic tenent of English/Canadian law is that those who first occupy vacant lands are the owners of those lands until such time as they give up ownership.

Thank you, Dr. Ross, Dr. Kupfer, and Dr. Smith for agreeing to listen to me. You are a distinguished Panel, and I feel honoured to appear before you.

My name is David Williams, with an "S" no relation so far as we know to (Native being spoken) Roger. Though I speak for Friends of the Nemiah Valley, perhaps I should tell you a little about who I am.

I'm a born and bred British Columbian and through my grandmother have routes here going back many hundred's of generations. My English pioneer land surveyor grandfather married his(Native word) wife and began a family in Quesnel in the 1890's.

My father was born there in 1898. Mt. Sidney Williams and Atasko Lake is named after my grandfather, Mt. Agnes at Quesnel after my grandmother.

Sidney Williams entered the Nemiah Valley in the early 1980's as inspector of surveys. As a result of that survey, he gave the great guardian mountain of the Xeni Gwet'in, it's English name of Tatlo. He took my father there in 1913 on horseback, and in 1967 my father took me

to the Nemiah Valley. I now have a home there in the Brittany Triangle 26 kilometres off any road. I walked many Tsilhoqot'in trails, camped out in the triangle and other parts of Tsilhoqot'in in all kinds of conditions for over 60 years.

I'm able to speak with passion and great depth of feeling but also personal knowledge of the land and people of the Nemiah Valley. The people are very special. They are my dear friends. As caretakers of the land, they recognize and take seriously their duty to protect it from undue harm. I stand with them in that great task. I know the (Native being spoken) fairly well. I've walked that land and conducted bear hazard assessments and assisted with grizzly bear research projects throughout that area. I have degrees in anthropology and library science. And I have also been a seaman, small rancher, worked in engineering and land surveying and been a hunter, a carpenter and built my own log houses. I've done economic development analysis. My more highly-qualified sons says I just couldn't hold a job.

As president of FONV, I'm a volunteer as our entire board. I have no

particular expertise that I'm offering here, just my experience. And many years of experience, but I speak for FONV and present this as an introduction to our expert speakers. They are the experts here on our behalf, not myself. I just want to present a few highlights and tell you who our organization is and what it does.

Friends of the Nemiah Valley (FONV) is a not-for-profit society under the Societies Act of B.C. We were formed in December 2000 as a result of the imminent threat of industrial scale logging in the Brittany Triangle (Tachelach'ed) placed between the waters, traditional hunting lands of the Tsilhoqot'in people of Xeni. Subsequently, we entered into a formal protocol agreement with the Xeni Gwet'in First Nations Government whereby we would agree to work together to protect the environment of the Nemiah Valley and nearby areas, and the chosen way of life of the Xeni Gwet'in people.

FONV programs include ongoing support for the Roger William case for Rights and Title, creation of the Elegesi Qayus Wild Horse Preserve, original wildlife research, cultural support for Xeni Gwet'in. We were instrumental in

introducing the First Voices program to the Nemiah Valley Naghatanequed School, funding of a Wild Horse Ranger (now in it's 12th year), cultural and social support for Xeni Gwet'in in the form of grants to the Nemiah Valley rodeo, to the Brittany Elders and Youth Gatherings and the Youth Wagon Ride. We provide logistical, guiding and some financial support to graduate students undertaking field research in Tsilhoqot'in territories. We have also supported the wild horse DNA study, a conservation analysis by the Craighead Institute of the Chilcotin dryland grizzly bear -- and I have a copy of that for you -- and the wolf diet did study. Every two years we conduct a helicount of the wild horses in the Brittany Triangle.

Our role during the present hearings is to present science-based information to the Panel that will aid you in your independent assessment of the Project, primarily but not exclusively with regard to terrestrial and sociocultural effects. Consequently you will have received submissions from the following range of experts:

You've already heard a presentation by Dr. Mark Pinkoski on the impact of

New Prosperity on aboriginal rights and title and the duty to consult and we hope it was useful.

The McKinnon report by Geotechnical engineer Don MacKinnon of West Coast Consulting. A review of increased road costs to the province that would be necessitated by New Prosperity.

The Lerner Report; Implications of New Prosperity Mine for the Xeni Gwet'in Vision For Sustainable Development by Economist John Lerner of Ecolibrio.

And tomorrow morning, you'll hear a technical report by Wayne core, RPBio, on grizzly bear feeding habitat values, movement corridors and grizzly bear numbers using the Teztan Biny MDA an effort of the Taseko study area combined with a detailed review of the New Prosperity 2011 EIS on grizzly bears and several other species of concern.

Karen Hurley, PhD, will be evaluating the sections of the EIS on cumulative impacts, watershed values and sustainability from an integrated, ecosystem, long-term perspective.

And finally a presentation by Dr. Jonaki Bhattacharyya on the cultural

relationships of Xeni Gwet'in and other Tsilhoqot'in people to the environments in the project area and the significance of the socio-ecological system that would be impacted by the proposed mine.

Our position. Our position on New Prosperity is informed by our experience with the Prosperity Mine Hearings in 2010 and subsequent Panel Report of July 2010 by our painstaking combined review of EIS for New Prosperity Mine and by a perusal of the many submissions to date from individuals and organizations, whether technical or not, and by the conclusions of our own experts.

While I've listened with great interest to the geology and hydro geology presentations and the technical reports to date and am able to understand to some extent, I have no qualification that would allow me to comment on them personally. However the precautionary principle was seen to be indicated given the many uncertainties that are evident.

Our position is also informed by our deep friendship with the Tsilhoqot'in people of Xeni Gwet'in and other Tsilhoqot'in

communities and our formal commitments to protect the environment and their chosen way of life.

We've concluded that we have no option but to oppose New Prosperity Mine for the following reasons:

The first is environmental impacts on the land, water, fish and terrestrial species, especially the blue listed Chilcotin grizzly bear. These would be so significant that they could not be mitigated and would add to a cumulative degradation of whole ecosystems within the region.

The consequences of the power line and road upgrading and other infrastructure developments required for the proposed mine would almost certainly result in a cascade effect of further mine development to the south, large areas of which are already under mining claims. Presently protected areas such as Ts'il(ph) Park, Big Creek Park, South Chilcotin Mountain Park, Nunsti Park and Upper Lillooet Park would become what biologists term islands of extinction for the large carnivores, the very apex species which indicate the relative ecological health of natural ecosystems.

There's the potential for long term contamination of the entire Fraser River system, and therefore danger to the priceless and already stressed salmon stocks of one of the province's greatest resources.

The potential for protection of the Chilcotin Arc, southern British Columbia's last great wilderness comparable in size to the ecological values to the Greater Yellowstone or the Great Bear Rainforest would be utterly compromised. And I have a report here for you by Dr. Carlos Carroll, December 2005, Priorities For Carnivore Conservation in the Cariboo Tsilhoqot'in Region.

The mitigation efforts outlined by the proponent appeared to us to be so complex as to be highly prone to failure. Given the lifespan of the structures and response to contamination, chemicals and physical structures involved, the containment, active maintenance of mitigation structures and response to contamination will surely outlast the lifespan of the corporation so at some point, the people of British Columbia will be responsible for maintenance.

On environmental grounds, we suggest this application should be denied. I'm not writing your report for you, but I just have some suggestions. The socio-cultural impacts, these are of extreme concern to us. Like all First Nations populations in Canada, the people of the Nemiah Valley have been heavily impacted by a colonial era that is only now becoming recognized by the Settler Society as having imposed a form of cultural genocide.

The legacy of residential school abuse, of the loss of language, the loss of a land base through the reserve system, of holocaust diseases like small pox, and some commentators believe deliberately spread by land speculators, and I refer to a recent book by Mr. Tom Swanky and subsequent social breakdown are realities that the people are just now learning to overcome.

What has been a painful process toward a reinvigorated culture and way of life would, we believe, be utterly compromised by the imposition of this mine.

The destruction of Little Fish Lake, (Native being spoken), of Fish Creek and

probably, ultimately, of Fish Lake, Teztan Biny, of the whole Nabas area, would be felt as a sacrilege and would be personally deeply wounding to every member of the community.

Today this community is bravely following a complex path that will allow it to be a part of the greater society on it's own terms and in a fashion that will sustain it socially, culturally and economically for seven generations and more. Within the communities, this mine is seen to represent a form of unwelcome, imposed development, neo-colonial in nature, that will close that path.

For this reason we oppose New Prosperity Mine.

The economic impacts. First Nations communities like Xeni Gwet'in and Yunesit'in have their own economic vision and you will hear more of this from John Lerner. In Nemiah, this vision includes protection for natural ecosystems while employing the best of modern planning and technology. They seek to be self-reliant, resilient, and sustainable for the long term, from ecosystem-based planning to forest management to the development of an independent

solar and wind power grid with underground lines, to a declared Aboriginal Wilderness Preserve and Elegesi Qayus Wild Horse Preserve, the Xeni Gwet'in are well ahead of the curve. They have pinned their future hopes for sustainable economic development upon minimal impact cultural and wilderness tourism initiatives that require maintenance of the land, waters and air in as natural a state as possible.

The Xeni Gwet'in have commissioned climate change studies and are planning for a future with reduced water flows and weather extremes. In this way too they are ahead of many communities in the Western hemisphere.

The several non First Nations lodges and bed and breakfast operators in the areas whose establishments can be valued in the many millions of dollars, share the shame ecological values and, as far as we can tell, without exception, the non First Nations residents of the Valley share the environmental values of the Xeni Gwet'in friends and neighbours and are strongly opposed to this mine.

A mine such as New Prosperity would compromise the Xeni Gwet'in vision for

sustainable development. We feel it is culturally inappropriate to a people whose first commitment is to sustainability for the long term, rather than wealth accumulation for the moment.

In 2010 we at FONV commissioned a report by Dr. Marvin Shaeffer of the Simon Fraser. Dr. Shaeffer concluded that there would be no net benefit provided by the Prosperity mine. He concluded:

> "Contrary to statements in The EIS suggesting this statement would generate billions of dollars on net benefits, the project would appear, based on the available information, to generate significant net cost for British Columbia's and Canadians as a whole."

Mining Watch has now commissioned an updated report from Dr. Shaeffer. The conclusions are un-changed for New Prosperity Mine.

Despite some increased net benefits derived from employment and business activity and some increased government revenues, these are rather dramatically offset by the increased cost of power that B.C. Hydro has to pay. That suggest a significantly greater loss for B.C. Hydro than previously estimated, closer to $50 million per year, as compared to the estimated $35 million in the report for the original project. Some of you may ask why your hydro bill is so high.

Dr. Shaeffer concludes the project would appear to generate significant net costs. And I have a question, the power line to be installed, I understand, by B.C. Hydro and that would be at public cost. I stand to be corrected on that but it's a question I think should be raised, and it's to be de-commissioned at the end of the mine life.

The road upgrade review prepared by geotechnical engineer Don MacKinnon for this review fills a gap that was not addressed in the previous assessment of Prosperity Mine. It lays bear an additional subsidy to Taseko by the taxpayer's of British Columbia. It concludes the

required upgrades prior to the introduction of mine traffic would cost $26.2 million, and extra annual maintenance costs due to mine traffic over the proposed 20 year life of the mine are $0.8 millin annually, an additional $16 million. Total overall cost would be $42.2 million over 20 years. Should the mine life be extended to 30 or more years, and we believe this is highly likely, given that half the ore will still be in the ground should the mining company still exist then costs continue to rise and may include the cost of replacing the aging Tsilhoqot'in River bridge at Hanceville.

These extra costs to the public purse only add to the conclusion drawn by Dr. Shaeffer there would be no net public benefit to the project.

The principle argument put forward by local New Prosperity proponents is that it will provide much needed jobs in the Cariboo Chilcotin and that it will revitalize local businesses.

Dr. Shaeffer points out that many of those filling the jobs that the mine provides will have to come from elsewhere. In the

face of greatly increased demand for skilled workers throughout Western Canada due to increasing resource development and the imminent retirement of many older workers, the reality is that we are facing considerable skilled labour shortage. Unemployment is due to decline. There is already significant new mine development underway in the Cariboo Chilcotin alone and Taseko's own Gibraltar is undergoing considerable expansion.

Here is a quote from the Victoria Times columnist last Thursday:

> "B.C. will soon need over 75,000 skilled workers for the LNG industry and another 60,000 to help with the construction of plants and pipe lines according to The B.C. Natural Gas Workforce Strategy Centre."

Another argument for development of this low grade copper and gold mine is that society needs these metals. Copper is a

valuable industrial metal with many uses. While there is indication demand is beginning to outstrip supply worldwide, at least 80 percent of all copper ever produced is still available or in use do to recycling.

Julian Simon of the Cadiff(ph) Institute has argued that new finds will continue and the very notion of peak anything is flawed. There is support for this view in the recent explosion of shale gas reserves which is threatening to create a worldwide glut of energy.

For this reasons and others, such as increasingly sophisticated extraction methods from existing mines and more recycling the need for more low grade and environmentally problematic mines like New Prosperity is moot.

Unlike copper, gold is primarily used an as repository of wealth; at least 41 percent ends up as jewellery, primarily in Asia, and 32 percent in gold bars and coins. Central banks hold another 11 percent, thus 84 percent of all gold produced does not go to provide the industrial elements we deem essential to contemporary society. There is no real shortage. It is only the presumed shortage that

creates the value of the metal.

While New Prosperity may create wealth for some shareholders and the managers of Taseko Mines Ltd., when methodologically correct accounting procedures are used and utilized in a holistic approach it looks like a very bad deal for most of the rest of us, and especially for the people of the Nemiah Valley.

We fear the mine itself may not even be economically viable in the long term. We are told this is a low quality deposit and there are some less-than-ideal financing methods. Rapidly fluctuating pricing of golden ensures that there is no such thing as long term certainty.

We are left with a nightmare vision of a bankrupt operation and the rest of us left with an abandoned mine that will require reclamation and water quality monitoring for hundreds, if not thousands of years.

The economic arguments alone seem to indicate that that society should step back from allowing such a venture.

Legal impacts. Chief Roger William on behalf of the Tsilhoqot'in Nation has taken the case for rights and title to the courts

of the land.

In November 2007, Mr. Justice David Vickers of the Supreme Court of British Columbia, after months of testimony, found that in the Xeni Gwet'in caretaker area the Tsilhoqot'in had proven rights to a vast area that includes Nabas, Fish Lake, Fish Creek and Little Fish Lake, the area under contention here.

He also found that title had been proven to approximately half of the total area claimed.

CHAIRPERSON ROSS: Mr. Williams, it's getting late and we've heard several of these. So if you can find some way of --

MR. WILLIAMS: I can speed it up.

All Canada is watching this landmark case for it's significance for First Nations wherever they are without treaties and wherever development is planned on unseeded First Nations territories.

Should this mine be approved, it is the stated intention of the Tsilhoqot'in to return to the courts to prevent it's construction

and protect their rights. We have every expectation that they would be successful. In any event, a prolonged and costly court case will tie any development up for years. At the vest least approval of New Prosperity Mine before the final Supreme Court of Canada decision would, it seems to us, be premature.

I was going to talk about Taseko Mine but I don't think I need to, except to say we note that there is no trust, or very little trust, between the Tsilhoqot'in people and Taseko Mines Corporation and that is regrettable, but it happened through a chain of events I have followed with some interest and is delineated in Jane Wellburn's Masters Thesis in Anthropology a couple of years ago.

In conclusion, the Tsilhoqot'in people and many of us involved in these hearings question why we must go through this process again.

The previous proposal, as horrendous as we deemed it to be, was supposed to be less damaging than the present proposal, even according to Taseko's vice president of engineering, and yet, it was rejected, and we've

lot about that today.

This seems an imposition to us costing in time, money and human resource. And one must ask, when is a win not a win? The answer is as here when they change the goalposts.

Widely respected ex-Xeni Gwet'in councillor Marilyn Baptiste has said we are in a fight for our lives. Marilyn has rightly stated the case for the people of Xeni Gwet'in.

Ultimately there's a morale question here. What rights have we, relative newcomers to a land that we came to and found abundant in resources and already inhabited by a sophisticated people, to continue to take from them and from a land in a way that consistently degrades both their way of life and the land they need to survive.

One more paragraph.

I recently flew over much of British Columbia and Alberta. I looked for places untouched by industrial development and settlement. I could find virtually none. We have accomplished this transformation in a mere 150 years. I wondered how the other species we share this land with, especially the great carnivores

like wolf and bears could continue to survive and how people who choose to live a life dependent on the land could continue to survive within some measure of their age-old ways as they choose. And I believe we have a test case here. How we resolve it goes to our character as a country, a country still reaching toward true nationhood. And can we continue to overcome the wrongs we've inflicted on the Indigenous people? Wrongs that have been an integral part of a global colonial movement of which we've been a part and that have led to catastrophic losses of species and cultures. Can we dispel that dark shadow? I think we can and I think you have the opportunity to take a first step in this new and better direction by listening carefully and hearing the Tsilhoqot'in people and those who stand beside them. I know you will, and I thank you for listening and I'll be happy to answer any questions.

CHAIRPERSON ROSS: Thank you, Mr. Williams. Any questions from the Government of Canada? Seeing negative shaking of heads. Any questions from the First Nations interested parties? Any questions from interested party

organizations? Any questions from interested party individuals? Any questions from Taseko?

QUESTIONS BY MR. KUPFER:

MR. KUPFER: One quick question, where did you get your information on the transmission line? Can you identify that, by any chance, on that being constructed, how it's being constructed?

MR. WILLIAMS: I posed that as a question. I don't know whose constructing it. I assume because it's not mentioned in the EIS, as far as I know --

MR. KUPFER: Thank you. Taseko can comment on that. I just want to say thank you for your sharing your personal story and your questions.

CHAIRPERSON ROSS: Because it's getting late in the day I'll thank you for your presentation and we'll move on to our last presentation of the day.

Our next speaker is Brian Toth, Executive Director of the Upper Fraser Fisheries Conservation Alliance.

PRESENTATION BY BRIAN TOTH:

MR. TOTH: Thank you, Mr.

Chairman and Panel members and SEA staff and Panel observers. I'll be quick, as I understand probably I'm the last here.

My name is Brian Toth, Brian with an "I". Toth, T-O-T-H. I'm the executive director of the Upper Fraser Fisheries Conservation Alliance, which is a not-for-profit society that is provincially registered and geographically based in the Upper Fraser watershed.

So our area from which our membership is selected is the salmon grade portion of Upper Fraser, so encompassing the five major watersheds of the Upper Fraser watershed, approximately upstream of Clinton, Canoe Creek.

We have a finance board selected from those areas, First Nations in those areas, including groups from the Tsilhoqot'in National Government and the Northern Secwepemc.

Our mandate is to advance the fisheries and aquatic-related interests of those First Nation groups and, really, how we were initiated in 2005, is when we formally incorporated, is commonalities in both cultures and challenges related to fishery management and

issues and interest.

Our core funding is provided from Fisheries and Oceans Canada and our role in relation to that funding is to facilitate essentially the information exchange component of consultation.

So the DFO has a rather large obligation to First Nations around managing fish to meet their fisheries needs and we facilitate a portion of that consultation.

So our area of expertise, and we have approximately five technical people that work for the organization, including myself. We work to build capacity to engage in the consultation, which is a very technical process in understanding fisheries management and work to build co-management relationships, both amongst First Nations and with the Department of Fisheries and Oceans, and other management agencies.

Some of the key activities that we do in relation to the consultation function are coordinate and facilitate watershed level forums, so we do those approximately 8 times a year, and we participate in a multitude of fisheries management processes, both First Nation to First

Nation, which is tier 1, bilateral government to First Nations government, and multi-lateral, which stakeholders and governments.

Our expertise is in understanding anadromous fish management and particularity Fraser anadromous fish, anadromous being salmon and steelhead, the policy surrounding how they're managed and it's application and how it inter-relates with First Nations' interests.

So interpreting the implications of management across those interests and a good understanding of the fish docs and how they support those interests and use.

So the UFFCA has submitted two documents to the Panel, the first is a review of the stock status information for just the Tsilhoqot'in anadromous stocks and the second is looking at the relevance of that stock status information in relation to Tsilhoqot'in use of the resource and their interests in the salmon resource.

First a bit about background and the methodology on how we did this. A stock status -- I need to explain we didn't do a status assessment looking at a long term period of record

of stocks. So spawning escapement records. We looked at existing information where government agencies had already done a status assessment. So we used existing information where it existed and where it doesn't I will explain what we did.

In a sense stock status looks at the population health, so a trend or abundance and from that you can infer resilience, vulnerability and risk of extirpation.

DFO's salmon management framework has been continually evolving and most recently since 2005 the department has adopted what's called "the wild salmon policy". The wild salmon policy provides units of biodiversity through which the department will manage towards. The conservation unit is the concept, and I'll refer to what is written in the policy about that in a moment, and essentially it also provides the criteria and the thresholds through which you would assess that conservation unit to determine it's health.

Conservation unit is the unit of biodiversity that the department has chosen to manage salmon through and it's defined as a group of wild salmon if you lose it would unlikely

re-colonize within a certain length of time.

So salmon do stray and re-colonize, lost areas. What they focussed on is what wouldn't be re-colonized in an acceptable period of time if you lost it. So the focus is on management of biodiversity and the conservation unit is the chosen unit of biodiversity that they determined.

Again, straight from the wild salmon policy, diversity is important because it's an insurance. It's a bank if you are faced with changing climactic conditions etc., the greater degree of biodiversity that you have in the landscape in relation to wild salmon, the better that chances that they'll be able to adapt and exist. And there are great examples of that occurring now on the Fraser River watershed.

For sockeye the wild salmon policy CU's are defined and the reference points are defined and it allows you to complete a status, and that has been done.

The DFO has published two papers on that particular aspect of applying status through wild salmon policy for Fraser sockeye. In the absence of wild salmon policy,

there's the ability to default to COSEWIC, which is the Committee on the Status of Endangered Wildlife in Canada.

So COSEWIC has done an evaluation of interior Fraser Coho of which Tsilhoqot'in Coho are a category of that CU they are endangered. Where stocks have not had their status formally assessed what we did was we looked at how DFO manages those stocks. So this is in the case of steelhead and Chinook.

So if there haven't been wild salmon policy for COSEWIC assessed we strictly looked at how are they managed on an annual basis and inferred from that how it relates to the other stocks that have been assessed.

Why did we do this? The purpose and intent is essentially understanding the status of those anadromous stocks within the Tsilhoquot'in gives you the ability to contextualize their existing viability and sustainability under the existing management framework, in further resilience to any additional negative effects and interpret the implication of any risk that may be identified in relation to this project.

So this is a very brief summary of what's in the written documents. In terms of Tsilhoqot'in conservation units, there is one Coho conservation unit, so the Coho that are present in the Tsilhoqot'in watershed are a component of what's known as the interior Fraser Coho conservation unit. It's status was COSEWIC assessed in May 2002 and designated as endangered. It still remains endangered. DFO has managed to a 3 percent exploitation rate, with no directed fisheries.

So it's essentially being managed to rebuild, which it has not been doing successfully to a large extent and 3 percent allows other fisheries that are vitally important economically to the commercial fisheries for (muffled) to occur.

There are 2 Chinook conservation units within the Middle and Upper Fraser and are both referred to as 5-2, referring to their life history, one spring, one summer. Both those CU's are managed as conservation concerns within DFO. It's a zoned approach must like the wild salmon policy but it's of their own making because the wild salmon policy criteria for

evaluating status hasn't caught up to Chinook just yet. They're in zone 1 and are at the lowest of their record in terms of escapement numbers. And there's one steelhead conservation unit within the Tsilhoqot'in, and the management objective for that stock is essentially to minimize the impact of all Canadian fisheries.

There are three sockeye conservation units, so these are independent biodiversity units. There's two that return to the Chilko Lake, they differ in life history and there is one that returns to the Taseko system. The two in the Chilko that returned to Chilko Lake, one is presently un-assessable in terms of status because it's deemed data deficient. The large Chilko, which is called the Chilko summer CU is designated as healthy. It's trending red or bad.

CHAIRPERSON ROSS: Mr. Toth, we're soon going to get to newspaper right?

MR. TOTH: Yes, we are.

Taseko is a small stock. It's been designated in the red zone meaning it's not healthy. It's designated provisional, meaning there are issues with the data related to the

spawning escapement monitoring.

It exceeds the thresholds identified through the wild salmon policy and the abundance indices have decreased from a peak period of 2,900 effected female spawners to 376 effected female spawners. In 2012 it was 40 effected female spawners.

So, summary conclusions. As I mentioned, the Chinook are not formally wild salmon policy assessed but are currently qualified as zone 1. Steelhead, again, not formally wild salmon policy assessed, but are managed as though they are in the red zone and are COSEWIC endangered.

So, overall, in terms of Chinook, Steelhead and Coho stats relative to potential project effects and risks, all of these stocks are at poor status; in fact, poorest in their period of record.

Diminished abundance and productivity. Adding any additional negative consequence to the productivity or survivability of these stocks is incongruent with DFO's existing management strategy and objectives for these stocks, the wild salmon policy and I would argue

also the precautionary principle. Any potential risk should be considered within that context and also the precautionary principle where we don't have data to properly assess the status of those stocks.

In terms of sockeye, as I mentioned the Chilko -- the one large stock returning to the Chilko Lake is actually designated as green right now, the other one is not assessable.

The Taseko stock is currently very poor in terms of status, or red zone, via wild salmon policy, provisional. It's an individual, designateable unit of biodiversity, not a population or a deem, as it's called in genetic terms.

Both the viability and resilience of the stock are at risk due to the existing management framework, so the framework through which DFO manages that stock which, at present, fails to recognize and adequately respond to it's status.

So Tsilhoqot'in sockeye and particularly Taseko sockeye relative to potential project effects and risk, any additional negative

influence on the Taseko sockeye stock's productivity and survivability would be incongruent with DFO's management strategy, the wild salmon policy and the precautionary principle and, generally, in terms of how it's been returning of recent, it would be very prudent. There's zero tolerance for additional negative effects.

Implications of risk should be considered, again, within the context of loss of independent biodiversity units.

We did two pieces of work, the second was looking at stock status relative to the Tsilhoqot'in nation interest. So understanding the status and health of the salmon resources that returned to the Tsilhoqot'in River is important to understanding how they're utilized within Tsilhoqot'in culture.

Findings. The Tsilhoqot'in S, or summer sockeye CU is supporting the bulk of the quantum of Tsilhoqot'in sockeye salmon needs. I'll show you a map in a moment. They're essentially are reduced or no alternatives for fishing in the Fraser mainstem because a number of additional upstream sockeye CU's are also trending

towards red zones.

So, essentially, if you're a First Nations attempting to practice your fishing right upstream of Hope, as it sits right now, you are essentially fishing Chilko in most years, and the stocks in the Thompson system to the right, some of them trending green and some are amber. It should be noted that they are largely cyclical. So that is the large dominant Adam stock, which only returns in large numbers once every four years.

What that means in terms of Tsilhoqot'in sockeye is it's increasingly becoming important to the overall Fraser sockeye catch, all catches, commercial, First Nations and recreational. It means there's increasing pressure on the stock and it's fished in aggregate fisheries, so with other stock which is going to increase the risk to further declines of the Taseko sockeye stock, which co-migrates with it, and reduced abundance of fish running to the Tsilhoqot'in itself. These are figures of the proportion that the Chilko stock actually contributes to overall Fraser sockeye catch. Not just sockeye fisheries in the Fraser River but

every fishery that might catch a Fraser sockeye.

The trend on the right hand side of the graph is most interesting and when you remove the late, those cyclical Adams run sockeye out of it, in the lower right both those graphs it's noticeable from 2004 to 2010 what a much larger proportion the Chilko is actually becoming of all Fraser sockeye catch. And that's by-and-large because of it's health, but of the stocks it co-migrates with, that map with all the red dots declining at the same time it's staying relatively healthy.

In summary, any risk of potential downstream impacts on the Chilko River should be considered within the context of the importance of that Chilko sockeye conservation units and it's contribution to all Fraser sockeye fisheries.

Tsilhoqot'in Nation fisheries for Coho, Chinook and Steelhead are all presently constrained by the abundance. When there is status and health of these stocks, the fisheries each support unique cultural practices and therefore cultural practices are at risk and rights are compromised and at risk.

Without any additional factors that may impair the productivity of the Tsilhoqot'in watershed salmon resource, Tsilhoqot'in's interest in these stocks it at considerable risk as it presently stands. That's it. Thank you.

CHAIRPERSON ROSS: Thank you. Questions from the Government of Canada? Questions from First Nations interested parties? Question from interested party organizations? Questions from interested party individual? Taseko?

MR. JONES: No questions.

CHAIRPERSON ROSS: Panel.

QUESTIONS FROM MR. KUPFER:

MR. KUPFER: Would you clarify for me, DFO is a member of the committee or just the funder?

MR. TOTH: They are one of our funders, a core funder, and they participate in our meetings, of course, because it is their consultation forums that we facilitate. They are not actually a board member or any kind of designated authority or governing structure or part of our governing structure, no.

MR. KUPFER: Your studies to date lead you to conclude that any risk would be detrimental to First Nations' culture and you're anticipating there might be a risk?

MR. TOTH: I have not looked at enough information about the mine to say for myself whether there is risk of effects or not. I understand listening today there is some obvious issues there.

All I'm saying is this is the status of the stocks and it should be considered within any potential effects or consideration of risk.

MR. KUPFER: Thank you.

CHAIRPERSON ROSS: For that very reason that we appreciate receiving your advice and your information.

QUESTIONS BY MR. SMYTH:

MR. SMYTH: B.C. has just gone through the most expensive and longest commission looking at salmon, the Cohen Commission, and I read the executive summary, I don't know if I can recall everything in it, there's so many items at play here, and what you're assuming is that there is going to be release or possible release of

metals from this mine into the Taseko River to have an impact?

MR. TOTH: No, I'm not assuming that. All's I'm saying is in the case of the Taseko the primary concern would the stock of sockeye and it's status and what any negative effect that may occur that is identified via this process in the EIS, it's implications.

So essentially in the case of the Taseko you have a stock that's virtually -- it couldn't go any lower. Last year there was 40 effected female spawners in that population. So if there's additional negative effects added through the project or risk it should be considered within the context of the loss of a designateable unit of biodiversity of Fraser sockeye.

MR. SMYTH: These females are probably being captured downstream?

MR. TOTH: That's part of the issue, yes.

CHAIRPERSON ROSS: Thank you very much, Mr. Toth. I think we'll move on now. At this point my understanding is Taseko needs, and I quote, "a minute".

MR. GUSTAFSON: I have good news for you. We've decided to defer our comment until our closing, until tomorrow.

CHAIRPERSON ROSS: Only down to five seconds now. Thank you very much Mr. Gustafson. In terms of my comments, again, as usual, we thank the many presenters for helpful information.

Mr. Nelson, you're looking like you need to say something?

MR. NELSON: I'm afraid so. I'm loathe to extend this any longer than it's already been today.

I may have missed the point -- I understood we were meant to learn from Taseko by the end of the session today when we could expect responses to the questions posed to them by Environment Canada.

CHAIRPERSON ROSS: Thank you. I overlooked that. Any advice, Mr. Gustafson?

MR. GUSTAFSON: I was awaiting your invitation, Mr. Chairman. Taseko does confirm that it will be able to respond to all currently outstanding undertakings before the commencement of the community sessions and we'll

provide them as they're available but that would be the latest.

And one other piece of news that I think you will appreciate, and that's the company will proceed with the remodelling, or re-running the model with respect to the TSF seepage pond deficiencies. I think that's what it related tod, and that work will be done not by the end of next week but as quickly as possible and we're just not sure exactly how long that will take. But it will certainly take a little longer than the other undertakings.

CHAIRPERSON ROSS: That's helpful. Thank you. And thank you, Mr. Nelson, for reminding me.

Again, thank you for all of the advice today. Tomorrow morning 9 o'clock, we will have the second day of this session with one exception and that is Mr. Core will talk to us about grizzly bears tomorrow because we simply could not work him in on any other day.

So I think I have forgotten what time tomorrow but he will be out of place. And lastly, closing ceremony.

--- Closing ceremony.

--- All the foregoing non-English words, when spellings not provided, are represented phonetically.

--- Whereupon the hearing was adjourned, to resume at 9:00 a.m on Tuesday, July 30th, 2013.

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

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