GIANT MINE PROJECT TEAM AND PARTIES TO THE EA
PRE-TECHNICAL REPORT WORKSHOP
Summary Report

This is a Summary Report prepared by DPRA Canada. All workshop participants were provided the opportunity to review and comment on an earlier draft Summary Report. Input received was incorporated into this final. DPRA remains solely responsible for any errors, omissions or misinterpretations contained in this report.

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LOCATION OF WORKSHOP: GNWT Boardroom
Basement of Lahm Ridge Tower
Yellowknife

OBJECTIVE OF WORKSHOP:

To update all Interested Parties to the Giant Mine Project EA, prior to the Technical Report submission, on site work and progress since the Technical Sessions in October 2011 and IR Round II in February 2012 and IR Round III in June 2012.

WORKSHOP ATTENDEES EXPECTED:
(Note that actual workshop attendees are provided in **Appendix I**

- Giant Project Team including AANDC, GNWT, PWGSC, and technical expert consultants
- Interested Parties to the EA
- Review Board staff as observers. [Note that "as observers" was removed at the workshop.]
- DPRA Consultants as facilitator and recorder

WORKSHOP PROCESS:

- The agenda is organized by theme and sub-theme based on the two rounds of Information Requests and the Technical Sessions held in October, 2011;
- Technical experts and other members of the Giant Mine Remediation Project Team will provide a brief update on progress and any on-site work related to the Project since the Technical Sessions;
- A period for questions and answers, and a discussion of recent results and what they mean, where there are remaining uncertainties and the process and timeline for resolving these; and
- A summary of the workshop will become part of the Review Board public record.

AGENDA ITEMS: DAY 1

1. OVERVIEW

1.1. Roundtable and Introductions

In a roundtable, all workshop participants introduced themselves. The list of workshop participants is provided as Appendix I.

1.2. Overview of the Purpose of Meeting

Following the review of some administrative matters, Ricki Hurst reviewed the workshop objective included in the draft agenda:

> "To update all interested parties to the Giant Mine Project EA, prior to the Technical Report submission, on site work and progress since the Technical Sessions in October 2011 and IR Round II in February 2012 and IR Round III in June 2012."

1.3. Discussion of workshop format, agenda and process

Ricki reviewed the workshop format, agenda and process as stated in the draft agenda. He then asked workshop participants to speak from their perspective, including what would make this a successful workshop.

Adrian Paradis: we propose doing it by themes and sub-themes as we did with the technical sessions. We would like to confirm where we have resolution on certain issues, and then identify outstanding issues that need resolution moving forward into public hearings.

Mike Nahir: we want to use this workshop to provide an update on technical matters and see what we can resolve today.

Kevin O'Reilly: Alternatives North (AN) had requested this sort of a session back in March and is glad that it is being held. We had asked that it be under the auspices of the Board, but we are glad that it is still being held. We are concerned that no transcribing is happening at this meeting. I had spoken to Octavio and Joanna about having transcribing and put it in an e-mail as this provides a more accurate record. I want it in the record that we had requested a transcript, and not having one makes things more difficult, as I will have to do extra review to ensure that our comments have been recorded properly. I am not happy that this request was not accommodated.

We do not have our technical experts here today because we have inadequate participant funding and do not have a new funding agreement in place for 2012-13. I had also asked that the presentations be circulated ahead of time so that we could be more prepared (emailed request to Adrian). It's not helpful that we didn't have this information ahead of time. I am glad this is finally being held, but we have

concerns about how it has been set up and the format. I am hoping to make progress today, as I have lots of questions.

Adrian: acknowledge Kevin's concerns. I am hoping to have a package from this workshop up on the registry by Friday morning and the summary shortly thereafter. As far as verbatim transcripts are concerned, they do have a purpose but as this is structured to be a less formal session, we felt that providing a summary of key discussion points, resolutions, and disagreements was more appropriate.

Alan Ehrlich: thank you for inviting the Board to participate. I think it's commendable that the developer, at the Parties' urging, has decided to hash out some issues now rather than waiting for the Public Hearings. We are here to observe, but I also encourage my [Review Board] colleagues to ask questions if it will help resolve issues before the Public Hearings.

Not having verbatim transcripts means that perhaps the commitments made during this session may not be legally binding. I recommend that to get around this, the Parties be able to review the summary of this meeting at the same time. This could help alleviate some of the concern about capturing what was said during this meeting.

We may raise questions, but we want to be clear that we are not Board members, and even if we all agree that something is off the table, the Board may not. So I want that to be clear. We are not here to assert conclusions or describe Board concerns.

I also want to add [in reference to a term used in the draft agenda] that there was no IR Round 3. The Board chose to ask some extra questions, but it was not an invitation to all Parties to participate, so please don't call it IR Round 3. We've got a lot to cover in the next two days and it's a heroic thing for the developer to hold their own technical session and bring the parties together.

Morag McPherson: if this was Board led, there would be more clarity on the process, and we're not sure how the observer role works in this workshop. There is a little bit of uncertainty about what "observer" means in this context.

Alan: I think that, without suggesting conclusions, we might ask questions because the right people are in the room right now and the answers may help us do our jobs leading up to the Public Hearings.

Amy Sparks: what time will we be discussing the diffuser? [Asked to determine when an EC colleague should connect by teleconference]

Adrian: I also want to note that we have received inquiries from the media about whether this session is public. It is, though we have not widely circulated a public invitation. If this is a concern to anyone present, please let us know.

Ricki asked if there was any discomfort with having media in the room and the answer was 'no'.

Two new people joined the session and were asked if they had any additional comments. Lynn Boettger and Todd Slack introduced themselves but had no comments.

1.4. Questions about Agenda

Kevin: there are some things missing that don't fit on this agenda - such as commitments and access to information. We will need to ensure that these issues are covered. Is it possible that transcripting would be possible for tomorrow?

Adrian: do all the parties want verbatim transcripts? I think the record is going to be fine.

Todd: I think that transcripts are appropriate and given the nature of this project and the timeframes, we need the context that these commitments were made in.

Mike: what about Alan's suggestion that Parties be part of the review process of DPRA's drafts?

Alan: So that everyone knows what was in the original record, and what has been added or removed.

Kevin: can you please look into this? I had sent a request and did not see a response.

Adrian: I will enquire about whether this is possible.

Rick Walbourne: I don't think we care either way, but if some parties prefer transcripts, we're not opposed. We are open to options.

Alan: you could also make sure you spend ample time at the end to make sure that everything has been captured accurately and have final agreement on what was said before people walk out the door.

Henry Westermann: also, if someone feels during the discussion that a statement they have made needs to be included in the record, they should say so to ensure that it is included. This might provide some assurance.

Alan: we could possibly use a Dictaphone as well, if people would be comfortable with that.

Kevin: will all the presentations be provided?

Ricki: yes.

Rick: how will this information be included in the Board process?

Alan: anyone who wants information from this session to be considered by the Board needs to submit their input to the Board. Any Party wanting to submit their view on this session is welcome to do so. We will not be creating our own report for this session, but when the DPRA report is sent to the registry it will become part of the Board's body of evidence for consideration. Each party has a responsibility to ensure the Board has all the information.

Adrian: copies of the presentations will also be included in the registry.

2. UPDATES and DISCUSSION by THEME and SUB-THEME

2.1. Updates on Underground Freezing

- FOS Phase 1 findings
- 3D modelling
- Lessons learned to date
- Wetting/saturation
- Update on plans for Phase 2 FOS study

Daryl Hockley, presenting on FOS Phase 1 finding:

Daryl noted that some photos have been added to help illustrate some of the key concepts.

Outstanding Questions and Discussion on Underground Freezing

Ricki stated that the presentation will be made and there will be time for questions at the end, but that questions for clarification during the presentation would also be welcomed.

Slide 4 – Diagram of the freeze pipes and a description of the freeze testing.

Kevin: slide 4 - if I'm a layperson looking at this, I would ask why those groups of thermosyphons and active freeze pipes are off-centre? Is it showing where they appear on the surface?

Daryl: this doesn't show the underground workings. For example, there are bulkheads in some areas that help determine where we place the pipes. We also found that surface geography does affect where we put the underground pipes. Drill size is another factor.

Todd: are any of these groups of pipes been operating solely in passive mode yet? Is the plan to leave these two groups as passive for the next few years?

Daryl: no not in the summer time, although we think that during this FOS phase there is some value in measuring what happens when the ground warms in the summer.

Todd: if things go to pot or go sideways, what can we expect?

Daryl: we do see value in running some of these tests because over the long term we will be relying on the passive system.

Paul Mercredi: what about groups G and F?

Daryl: they started off being operated passively, and in May 2011 we switched those into hybrid mode. The current concept is to actively freeze, either with a classical or hybrid system, and then switch to passive over the long term.

Todd: what happens after you turn the system off?

Daryl: we want to see what happens. We haven't yet cooled the centre of the chamber to the temperature we want, so we are currently debating when we switch to passive mode. We need to understand the physical properties of the dust, as this allows us to model.

Kevin: as I recall, your target is to have a freeze wall that is -10 C over 10 meters?

Daryl: yes.

Alan: are you making your contour inferences using modelling only?

Daryl: yes. We have to parameterize the model, but the physics is very good and proven.

Kevin: which one is the cut-off? Is it -10 C? Which level of blue? It looks like there isn't ten meters of freeze there. [Kevin references the colour coding used in the PowerPoint presentation]

Daryl: we haven't yet turned them all on, as we haven't completed construction of the bulkheads.

Kevin: will the entire chamber freeze in time?

Daryl: yes.

Kevin: then why are you doing the wetting?

Daryl: we are still determining that.

Paul: will you have anything coming down the middle?

Daryl: the current thinking is to have the freezing around the outside. Our preference is to not drill through the dust. But we may perhaps be able to build a "ceiling" as well as the walls.

Alan: why would you not want to drill into the dust?

Daryl: it's hazardous material and workers do not like working in that type of material.

Adrian: drilling into the dust adds many levels of complexity and the less handling of the waste the better. It's a health and safety issue.

Kevin: are thermosyphons horizontal as well, or just vertical?

Daryl: there are horizontal, but vertical is more appropriate for the flow of material through the pipe. For long term ease of maintenance, vertical, or mostly vertical thermosyphons are preferable. Some variance, 15-20 degree angles, is allowable. For the floor, we have active freezing pipes rather than horizontal thermosyphons.

Kevin: so you can create a wall, and a ceiling, but not a floor?

Daryl: because the rock is more conductive than we originally thought, if we extend the pipes further down, they will close that bottom fairly quickly. It's looking like we may not need horizontal pipes.

Todd: if the rock is more conductive for cold, it would theoretically be more conductive for heat as well. Is there a surficial influence? How does this affect worst-case scenarios?

Daryl: slide 13 shows our temperature data.

Kevin: the passive system, using whatever diameter and spacing and so on, only works to about -10 C. Different configurations will allow you to get it to work at higher temperatures as a passive system?

Daryl: we can fiddle with the pressure of the CO2 and get it to work on warmer days, but we set it up so we have maximum cooling power.

Kevin: can you keep it frozen forever?

Daryl: yes. Keeping it frozen forever is going to work. This is what we've modelled. The point of the testing is to give us the data we need to do this sort of modelling. Every freeze system in the world is based on this kind of modelling. One concern was about 3D modelling. We are doing 3D modelling, but it does have its difficulties. One challenge is displaying a 3D model on a 2D surface (paper or screen). 3D modelling is inherently more complex, and we usually only do this type of modelling when a problem is 3 dimensional. We have noticed some positive effects from our 3D modelling of some of the corners. At no time will we be putting together a 3D model of the full extent, this was never the intent.

Todd: if you are not the designer, who is? And if this is not the design, what is?

Daryl: we are the technical advisor. When we were contracted, it was made clear that the technical advisor would not be doing the design. This was to ensure no bias from the technical advisor. We will hand our technical recommendations over to the designers to create. We have a report that will be submitted for the design team to work from.

Rudy: there are a lot of pieces that will go in, such as drills, pads, pipes, etc. The details such as the number of bolts, etc. will come along later. (Such a contract has yet to be procured).

Daryl: to work effectively with a design team, you want them to have as much detail as possible in their guidelines. There are many stages of design.

Alan: to paraphrase: you're going to take some of the weirder shapes and by describing how to do the difficult ones, you can work back and figure out the simpler ones.

Daryl: our guidelines will be more specific than that.

Alan: so your design guidelines will be robust enough to cover all the chambers. Also, the FOS is for a relatively small chamber, and you mention the conductivity of the rock. If you have a small one, it has a lot of edge compared to middle, and it's freezing nicely. Do you know how this will work in the larger chambers, where you have more centre to surface?

Daryl: the most important thing is that we have abundant freezing power for the initial freeze, to cover any gaps. We have more freeze power than we need, and we can make use of those in our freezing zones. Our modelling shows that the distance between the pipes gives us enough freezing power to create the initial freeze faster than we thought and be able to freeze a large area.

Amy: so, your modelling shows it's going to freeze faster than you thought?

Daryl: yes, we thought we would be looking at a range of one to three years, and now we're looking at one year for the initial freeze.

Alan: so your limits on your power to cool the brine water: are they financial, or equipment? Are you confident that your range is going to cool it as you expect to?

Daryl: -35C is a target, but you can go to -40C if you want to. It's conceivable that we could run our pipes in series, and even at -25C, it's still doing its job of freezing.

Mike: pipe diameter and spacing have been shown to have little effect on the freezing, and these are major cost factors.

Daryl: it is much harder to freeze wet dust than dry dust.

Kevin: what happens if the dust is not saturated?

Daryl: it's a difference of months and years.

Kevin: then why would you wet it at all?

Daryl: we are still working on this decision, and the results of the FOS will be a part of this decision. What we are asking ourselves is whether the wet freeze is of more value than the dry freeze.

Todd: was the initial purpose to create a heat sink?

Daryl: the purpose was the idea that the ice would provide thermal inertia to keep the chamber cooler longer. We are looking at the cost implications and the pros and cons of wetting versus not wetting and our results will go into our design recommendations and guidelines.

Kevin: Slide 23 – is this model for saturated or unsaturated dust?

Daryl: this is for saturated.

Alan: so for a 50 year period, even assuming a greater amount of climate change expected, you have good containment for the modelling you have and you can say this with a high degree of confidence.

Daryl: I can say more than that. By 50 years we will have reached a steady state. If we say 50 years or 500 years, it will remain frozen. There would be a 7.2 degrees increase over 50 years and then it remains steady after that. It will remain frozen after 50 years, even with only passive freezing.

Kevin: what difference does it make to run this model without the wetting?

Daryl: my suspicion is that it will make no difference at all. Freezing water only happens at 0 C. With salinity, it's at 0 to -1C. Our modelling shows -5 or colder, so it's a set point.

Paul: you talk about adding mass to this system, because it takes longer to warm?

Daryl: it has to be water. It's the most benign cooling agent you can add to the system.

Kevin: what happens if the water expands and cracks the pillars?

Daryl: we will discuss wetting in more detail shortly, and we are still considering the benefits of wetting. There are a number of factors that will need to be managed and a lot of challenges.

Kevin: is there an issue with how much energy it will take to freeze the block?

Daryl: we have a number of issues to consider, including the costs and the potential expansion of the block. I want to distinguish between the layperson's version of risk and the engineers' version of risk. There are still engineering risks, such as ensuring we don't crack the crown pillar and how we ensure the water doesn't leak out. We will deal with these risks, and address the potential cost factors associated with wetting.

Todd: what we discussed in the Technical Session was measures and criteria for determining if this will be a success. We have heard -10 C over 10 meters, so just to be clear, under these conditions, are we seeing this? So while we're not above 0 C, we're already exceeding criteria discussed in the technical sessions?

Daryl: we want to be clear that we never said it will be -10 C over 10 m forever. That is for the initial freeze.

Todd: how will a person on the ground in 25 years know that the freeze is still successful?

Daryl: we are still determining these numbers. 0 would not be acceptable, so we need to set some numbers that are in the right range.

Todd: this is THE component of your project. We have asked for this over and over again. This is the most studied part of the project, so we should have these numbers.

Daryl: even if I gave you a number right now, it would not be sufficient for your needs. Once we have these models complete, we can look at where would be the best point from which to monitor. We need to work these things out before we can have quality modeling.

Todd: to leave these things for the future, that leaves the project with an avenue to claim success. We need to have something now to measure and determine whether this will be a success.

Daryl: if we give a number, that means the engineers have a hard rule to design for and limits their flexibility to work toward a design that works based on the circumstances. My fear is that if we give the engineers too hard and fast a rule, it limits their ability to work flexibly based on their circumstances.

Todd: you have to give us something as a starting point, there has to be some kind of design guidelines that will have relatively hard and fast rules. This is the principle question we are discussing, so this has to happen in the next month or so, so we know that the rule isn't a bad rule.

Daryl: I have to think more on this and will give you an answer.

Mike: this […a narrative of failure…] is an interesting proposition, and we will need some time to think about this.

Kevin: I understood you were looking for -5 inside the block, which sounds sort of reasonable, and we don't expect anybody could attach a monitor to the corner of the block, for example. But we do need

you to tell us how and where you are going to monitor. When you take this to the MVLWB, you will need this information or you won't get a licence. We need some assurance that this is going to work and how you know it's going to work. I see that you've done your 3D modelling, and accounted for climate change at the high end, but you need to tell us what are your contingencies in general terms, to ensure that this system will work in the years to come. Telling us that you will have an answer in five years doesn't give the public confidence, and before you start contracting or applying for licences, you need to know how you are going to monitor and what will be your measures of success. Mike should be answering these questions, not Daryl.

Mike: the purpose of the FOS was to determine the outside limits and we've established that it works. -5 was our target inside, -10 was our target outside, and we're still on that path. In extreme scenarios, we will need to have some mitigation measures, and our adaptation will have to work. I can't talk to 10,000 years down the road, but I believe we are on the path you guys hope we're on. We haven't been specific on the details you're asking about, because we are still in the FOS phase, and this will be determined in the design phase.

Todd: for the purpose of the EA, you are basically asking us to "trust you". For the people of Yellowknife, it's not enough to have Ottawa say you will do a good job. We need numbers on paper.

Mike: we have committed to the FOS parameters, and we have been up front about the design guidelines. We have put a lot of investment into this modelling and we think that has been worthwhile.

Octavio Melo: would it be fair to say that in addition to FOS modelling and so on, would you be able to give some idea of where monitoring would occur and at what point mitigative measures will need to be taken, e.g. trigger points and applicable contingencies?

Adrian: the FOS is a moving target, and we are in the midst of an EA, so it's a matter of timing. Unfortunately, the two things do not merge well.

Amy: could you be broader with your monitoring points? Make it a less specific rule?

Daryl: that is what I would like to think about and get back to you on.

Daryl: I'm worried that if we give you a premature number, people will be bound by something that doesn't work. I will try and come up with something you can have confidence in that still allows us the flexibility we need for design.

Kevin: thank you for bringing this forward, but I don't really know where this FOS stuff is going. It seems you keep meeting and deciding what to change. It seems this is being done off-the-cuff. It seems that the reason you wanted the FOS exempted from the EA was so you could keep changing the design.

What is the plan and how will this information be used that will give you the design information? You guys are doing this stuff, you don't communicate it very well and you make the decisions on what the design will be at the end of the day and that's not a good way to proceed with this project. We don't like what you're doing. Once you have a design, how do you measure for success, how do you monitor? I want to see a series of scenarios for this modelling so I know what the options are. I know you are worried about costs, but sometimes cost isn't an issue for those living right next to the project. I don't have a sense of how the FOS will be used.

Mike: I just want to address the cost issue. I want to be clear that cost is not the only driver in this issue. I want to remind you that the Frozen Block method is an expensive option that we have had to sell to Ottawa. In terms of determining what success is, we've had to adapt to all the different chambers and stopes, and to continue monitoring to obtain more results. We have outlined a series of mitigative options and are looking at a number of parameters to see where we can adapt our system and see how those adaptations affect the effectiveness of the system. We're looking at how to continue monitoring and adapting variables to obtain optimal performance. Procurement is also a big deal for us, and we anticipate that through the licencing process, we will have more precision about how and where to monitor the system and what the triggers will be.

Octavio: Daryl and I discussed involvement of the parties in the process of reviewing these results and commenting on what you can measure, etc. and we will talk tomorrow about the EMS, which provides an opportunity to have discussions about elements and components. There may be other vehicles, which we will discuss tomorrow.

Kevin: this is helpful. BHP Billiton, as a private developer, had a workshop where they walked stakeholders through the details of their tailings design for the life of the project. They walked people through the costs and the designs, and the company took the advice of the folks because they hadn't made their decisions without stakeholder input. We expect at least as much from a government proponent, especially for a project as significant as this. I would like to see a more robust set of scenarios, and see the triggers and the design implications and how you take this into monitoring. I don't know much about the last EMS Working Group meeting, but it seems to be focused on taking down buildings, and I think the frozen block method is the key piece to be focusing on, forget the buildings.

Octavio: we need to work out as we move forward summarising all the information and commitments into matrices that we can sit down and look at and identify where our uncertainties are. We look at these to determine what we're going to measure.

Kevin: Mike talked about other projects like Colomac and Faro where working groups have been set up to better understand and help evaluate the data being collected and determine where it's going. I want to know what your plans are about what you're going to test and how you're going to decide how to do it.

Adrian: I have a general question about priorities for the parties – we've spent time on different aspects of the consultation and engagement, and there is good work coming out of that. Between October and now there hasn't been a lot done in terms of meeting about the FOS. I pose to you; give us some feedback on what your priorities are? Are we not focussing on the correct things at the correct time?

Mike: I understand that there is a frustration about not knowing what's going on and that information is not complete and not being shared.

Todd: what we are concerned about is that this is a huge piece of the project, and the information doesn't look like it will be available in time for the EA. We know what the project is proposing for things like soil and water quality, so why not FOS? E.g. "The remediation will be successful when the soil sample comes back at x amount". So what is the equivalent for the FOS?

Mike: in the DAR it states that information.

Daryl: the DAR states the freezing levels – there is a huge difference between a freeze system and soil contamination levels. There are a lot of different factors that need to be worked out.

Paul: my interpretation is that you do not want to handcuff the designer by being too prescriptive.

Daryl: basically, I think that we would be in a better position to give you numbers once the FOS has been completed and the design is further underway.

Paul: I am wondering if a "narrative of failure" rather than a "definition of success" be more appropriate? E.g. so instead of target -5, say do not go above -3 or something like that. I understand that the engineering parlance has to be specific for their task, but I'm wondering if the narrative of failure approach would provide parties with a better idea of how these measures could be applied. Using words rather than numbers to ensure that the designer can have the flexibility they need while staying within their parameters and thresholds.

Mike: this is an interesting proposition, and we will need some time to think about this.

Kevin: one of the criteria you already talked about is that you need to keep the block frozen below -5 or things will start to leak out of it. That might be one criterion. Another along the narrative lines is maybe that the community wants 5 years advance warning that the system is thawing, for example. That's the sort of thing we need to think about as a measure of mitigation and success in terms of action points and triggers.

Paul: there are a number of ways you can get to that narrative of failure, but the narrative is the same.

Daryl: would it be satisfactory if the whole process of coming to what Kevin describes, e.g. "this is how we think a failure might occur, and in order to monitor that, one needs thresholds, and needs to consider warning periods, who to contact, etc." if we lay these out at this stage, would that provide some confidence from the parties?

Kevin: yes, what are the steps you are going to go through to get to where you need to go?

Mike: you (Kevin) spoke about decisions being made, and there are some implications that will come out of the FOS that we can address.

Todd: I think there is information that you don't need right away, but you do need to set some rules that will bind future engineers to ensure that success is maintained.

Mike: I understand the desire for a target, but we do have to keep flexible.

Alan: it is possible that the Board will want to know the cost of the project/ cost comparisons, and so be prepared to present some cost information at the Public Hearings.

Kevin: slide 32 – Trade-off Study, I understand that you can release some information about configurations and what works, while holding back proprietary information, but I want to know if you will be submitting this to the Review Board? I would like to see this before the Public hearing, and if this is happening in July, this would be a good way to pull all this work together. It would be helpful if this package could be put together and submitted before the Hearings. A version of the Trade-Off Study that includes considerations and steps would be appreciated.

Mike: we need to look into that and check the federal process for whether or not we can do that.

Alan: I also suggest that if you are putting something on the record; indicate how much active maintenance is required for these tasks over the long term, so we know what is required over the long term.

Alan: when you say "effectiveness", I want to make sure we're on the same page. I assume it means no change to the amount of time it takes the block to thaw whether the block will be wetted or not? Would the thaw time change?

Daryl: the wetting study is under the assumption that we are going to wet, and describes the complications. What effectiveness means is that none of these obstacles will prevent the freeze from happening.

Alan: assuming no ongoing maintenance of the site, in 1,000 years or something, let's say everything has shut down. If there will be differences in thaw time between wetted or not wetted, we need to know what those differences will be.

Daryl: we always look at the long term. All of our thawing scenarios have looked at non-operational thermosyphons. Wetting or not wetting the block will not have a significant difference in the thaw times. We only take credit for the freezing outside the chambers. We assume that once that shell has thawed and any water reaches the arsenic, it doesn't matter what's inside the shell, it's the shell itself that we are talking about now and this is unaffected by wetting or thawing inside the shell. Wetting prevents water flowing through, but not contact. It's important to have the results of the FOS so we can say with authority and confidence how things are expected to occur.

Paul: will each chamber have a floor?

Daryl: longer pipes will be used, and they last forever, and therefore there will be a frozen floor.

Paul: so this happens during Phase one. When does wetting occur?

Daryl: any wetting, if it occurs, will be done after the -10 C over 10 m has been achieved. The groundwater has very little effect on the freezing. The geothermal gradient is what constrains how far down you can freeze.

Rudy Schmidtke: we have a lot of man-made contours underground, and we have done a lot of testing and exploration and the groundwater will not be an issue.

Paul: so you will still need to drill a well through the middle, should the team decide that route, what are the implications?

Daryl: we will have to consider the size and other H&S concerns if we choose to move forward on this.

Kevin: will the wetting update be filed with the Review Board before the Public Hearings?

Mike: yes we plan to. (I'm looking into what's required in releasing material in regard to protocols on proprietary material)

Kevin: how will wetting effect reversibility of the freeze, should the arsenic be mined in the future or a different system be put in place? This is something to keep in mind going into public hearings.

Daryl: we have a visual demonstration.

Todd: I have a suggestion for potential opportunity here. One of the questions will be future land use, and now we have a good idea of what this will look like. I think it's worth considering whether now is the time to get together and discuss the types of land use that will be permitted in and around the thermosyphon forest.

Adrian: the city has committed to holding a workshop on this subject, and we are willing to provide all the information

Kevin: I want to confirm that the commitments on the FOS Study and the Wetting update have been captured. I also want to mention the visual demonstration and suggest that live monitoring information might be put on the website so people can do their own monitoring.

I like that the wetting might not be necessary, and I like that a passive system looks feasible, as I think an approach that requires less technology, less energy and less maintenance is preferable, especially in terms of perpetual care. I get this feeling that maybe a passive freezing system will be able to be done rather than a lot of drilling and active freezing. I would like to know more about this. You've talked about wetting and that it requires drilling, and that it proposes more risk than not wetting. Something about the wetting doesn't seem quite right. We heard Bill Horn say if you add water and freeze it, it will expand, and so what does that do to the chamber and the crown pillar? It makes me think it might not be a good idea. I understand that wetting might provide an extra level of redundancy in terms of thermal inertia. I would like this better defined. For me, the less messing around we do under there, the more reversible it could be. I think we should be moving towards the passive freezing system.

Daryl: there would be about the same amount of drilling, but the big difference would be the initial freeze.

Adrian: I want to talk about live data, and how we can make this data meaningful so people accessing it can understand it and use it.

2.2. Updates and Discussion on Water

- Diffuser
- Ice thickness
- Modelling
- Sediment survey
- Effect on habitat

John Hull, discussing the Diffuser.

Outstanding Questions and Discussion on Underground Freezing

Morag: have you estimated the velocities coming out of the diffuser ports?

John: I don't have those with me, but we have that information and I can get that number for you. [Note that the velocities were provided by Bruce later in this presentation as provided originally in the response to IR AN 10.]

Todd: does the mixing refer to temperature as well as contaminants?

John: we did include temperature in our criteria.

Todd: so which of your criteria was the driver in the ratios?

John: arsenic has always been the primary driver.

Todd: so temperature is returning to ambient before you get to your 100:1 ratio?

John: yes, so it would not impact the ice thickness. We considered angle of the pipes, and the temperature of the water leaving the Water Treatment Plant, as well as the cooling of the water in the pipe as it runs along the bottom of the bay. Does this answer your concern?

Todd: fair enough.

Anne Wilson: question about stratification – why does it range from 6-12 meters in the different graphs? Why would the stratification remain below the thermocline?

John: modelling suggests it wouldn't break through the thermal layer separating the bottom and top waters and one of the factors is the temperature in the Bay during different times of year. If it did break through, it would only improve the mixing.

Bruce: in regard to Morag's question, the velocity of the discharge from the diffuser ports is found in the response to to AN IR 10 and ranges between 6 and 10 metres per second.

Todd: you just said that the ice thickness would not be affected, but now you're saying some ice thinning could occur.

John: we are still making sure that the modelling is correct and that the monitoring occurs. What we are saying is that if modelling shows thinning, we will make adjustments to the design to ensure that actual thinning does not occur.

Todd: you said you would be studying the ice thickness during the freeze and thaw periods. What has been done on this?

John: we have been doing some modelling to check what the water quality is. In January, we sampled at a number of locations (see slide 12). This year we studied in February and March. The plan is to do an August-September timeline, and again in September-October, and again in January-February. We have

also gone back to the historical data for ice thickness, and have determined that so far, the mean and maximum numbers are in the range we have sampled, and we are waiting to see what the data we have yet to collect will show us.

Amy: if the maximum depth in Feb is only 4.4 metres, how would that affect reaching your goals? If the water depth was less, how would that affect your models?

John: we wouldn't put the diffuser in shallow water because we wouldn't get the desired mixing, so we did a survey of the Bay to determine the optimum location of the diffuser.

Alan: which way do the currents flow from the diffuser?

John: one of the things that the upcoming sampling periods will incorporate is currents. We need currents, under ice samples, and water quality.

Alan: you should have preliminary sampling available for the public hearings if you're doing sampling in August.

nod of heads at the proponent table

Bruce: If samples are not collected until the later half of August, it is doubtful that results will be back from the lab in time for the hearings.

Kevin: why haven't monthly samples been taken between October and now? Why hasn't this work been done?

John: Some, but not all of the sampling required for the model has been done to this point. Further modeling is required for the EMS planning and this will be done as needed.

Kevin: we talked about the shoulder season in October, what is it that you are going to be able to tell us in the Public hearing? What is local thinning? How thin is that? How will that effect the shoulder season? How is February-March data going to answer these questions?

John: we can put our data into our modeling system. During the EMS phase, we will be able to adjust our model accordingly to ensure thinning doesn't occur.

Kevin: so there will be no thinning along the 81 m trough?

Mike: the comment is that we want to validate that the ice is not thinning.

John: the model says there is no difference during the shoulder season.

Kevin: I want to see that modeling.

John: we want to complete our modelling. The modelling shows that no thinning of ice will occur. We need to do our sampling to confirm that our model is correct.

Bruce: the plots show the physical mixing of the discharge with the ambient water in the Bay.

Kevin: has the thermal modeling been done? You've shown mixing, but what about thermal modeling? This is not the thermal modeling we have been expecting. The energy of the mixing could create temperature differences, couldn't it?

Bruce: we are still collecting the data to confirm this modelling.

Mike: we don't have the data yet to complete the thermal modeling. That data will be collected this summer. We're saying that we do not expect thinning of the ice, and we are trying to verify this through our data.

Todd: do you commit to 'no thinning of the ice'?

Daryl: this can only be verified through modeling and the data we are going to collect. The essential point is that we can modify design to ensure no ice thinning occurs.

Mike: we need our evidence before we can verify anything.

Todd: the YKDFN use this area all the time. We're concerned that at a later date, the project team might say, well there's thinning and there's nothing we can do about it. What is the proponent's commitment to ensuring that the ice thinning will not occur?

Mike: our commitment is to meeting our remediation objective concerning ice thinning as a result of our design.

Kevin: we are looking for a commitment that the diffuser will not cause any thinning of the ice.

Daryl: we have to look at it in terms of safe use, e.g. if the ice is 1m thick and it thins to 99 cm, there is a thinning, but no threat to public safety. We need to look at the end uses – TK can inform us of the uses and we can ensure the design will meet these standards. The onus is on both sides to determine use and the design can be modified as needed to ensure safe use, depending on what that is.

Kevin: we are going to have to agree to disagree because I don't see how we will get out of this. This is your project and if your project causes thinning, you should be responsible for that impact. If you can't make that commitment now, this issue will go to the hearing and we'll see what the review board has to say. Shifting the onus onto the public is not the correct way to move forward.

Anne: Water Quality Monitoring – you said September, will there be summer work? Why is the second water quality sampling in September, why not through the summer?

John: there will be future sampling done into the future

Anne: are there any concerns with the diffuser arms staying in place?

John: diffuser installations in other instances have been successful and pipes haven't been moved or damages. Monitoring and inspection of the pipes will occur, and will be determined during the EMS planning.

Morag: there hasn't been an instance where a fisheries authorisation is required; this information is still to be determined as we get more details on the diffuser. It's not pre-determined that you need a fisheries authorisation but the information being collected will inform that decision.

John: our data that we're collecting will be used for this as well.

Bruce: To answer Amy's question about prediction of effects on sediments in the mixing zone we have not assessed the effect on sediments in that near mixing zone yet.

Todd: on the two studies Amy mentioned (sediment and fish habitat) is there an ETA on those reports?

Mike: they are part of the program; part of which is scheduled for this summer. We can get back to you on that.

Todd: on the historic values that went into ice analysis. Did you also include water levels?

John: they didn't record water levels, so there are some quality assurance issues with that data. Water level does impact ice thickness.

Kevin: is the modelling of the diffuser effluent going to include some far-field water quality monitoring?

Bruce: I understand that the next phase of modelling will include all of Back Bay and Yellowknife Bay up to School Draw.

Kevin: I understood the City was looking at an area off 48th Street for water intake for potable water, you might be advised to talk to the city about their possible water intake.

John/Mike: we can check with the City to determine the location and investigate the options of including that in the study area.

REVIEW OF LIST OF COMMITMENTS (from March 8, 2012 letter to Review Board from AN):

Round II IR Request 01 Response

Kevin: We feel you did not adequately respond to this request.

[Note that the following "List of Commitments" items were subsequently verbatim from Appendix 1 of the Alternatives North letter sent March 8, 2012 to the Review Board. The text below captures the brief verbal exchange between Kevin and Adrian Paradis on each of the commitments.]

1. "Developer to communicate information gathered at Technical Sessions to appropriate officials at Aboriginal Affairs and Northern Development Canada."

   Response: This is the ongoing practice for AANDC management.

2. "Developer to carry out 3-D (three dimensional) modelling of arsenic chambers for freezing and thawing."

   Response: [See page 8, paragraph 5 of this report for response to this subject].

3. "Developer to carry out diffuser modelling and under-ice tests to measure effects on ice in Back Bay."

   Response: Modelling is underway.[See pages 16 – 18 for a detailed discussion on this subject].

4. "Developer to work collaboratively with the City of Yellowknife on harbour and marina planning."

   Response: There will be access to the City's boat launch.

5. "Developer to carry out bench scale testing of the water treatment plan sludge to better characterize it and plan for its disposal."

   Response: Testing is underway.

6. "Developer to [sic] arsenic loadings if the North Diversion is used as a contingency.

   Response: The North Diversion of Baker Creek is no longer an option being considered as a contingency for this project.

7. "Developer to carry out demolition of roaster complex buildings only when weather conditions are favourable."

   Response: Agreed.

8. "Developer to submit CALPUFF air quality modelling to the Review Board in February 2012."

   Response: The CALPUFF Report has been submitted to the Review Board Registry.

9. "Developer to consider how to involve stakeholders in risk assessment and risk management."

   Response: This is an ongoing discussion item.

10. "Developer to work together with stakeholders on perpetual care scenarios and environmental management plan over the next few months."

Response: EMS discussions are currently underway.

11. "Developer to consult stakeholders about content of Annual Reports, specifically on financial reporting."

    Response: Agreement was to ongoing discussion.

12. "Developer to work collaboratively on social acceptability criteria as part of the risk management system."

    Response: [See response to # 9 above].

13. "Developer to ensure there is a ten-year re-evaluation forever, not just during implementation."

    Response: Developer agreed to "long term".

14. "Developer to make project audits public."

    Response: Developer agreed to make EMS Audits available.

Kevin: what is the distinction between commitments and ongoing conversations? I'm trying to figure out why you don't feel they are commitments, but you're still doing them.

Adrian: we tried to define commitment in our response to the IR, and how a commitment is over and above standard practices of the EA.

Kevin: does the Board have a definition of commitment?

Alan: nope, we don't have anything specific in our definitions. From my perspective if you say you're going to do something that's a commitment. Perhaps we have EA commitments, and "other commitments".

Mike: these could be called other commitments.

Kevin: my list is a list of things I felt you committed to.

2.3. Water quality objectives

- End-use objectives
- BAT
- Water Treatment

Bruce Halbert, presenting on water quality objectives and BAT.

Anne: background concentrations – are there measurements in under-ice conditions – is this data available?

Bruce: the first round of sampling that was done in the Bay areas was done in under-ice conditions.

Adrian: this information has not been posted yet, but it will be provided.

Todd: I want to point out that this is R2 YKDFN IR 01. If you still want to answer it, I am still open to looking at that information. This IR was never answered, does the proponent commit to providing this information? How do we not have more information about Back Bay, considering the history of the project? Is the old information unusable?

Bruce: we've discovered with the data that levels are much higher the further you go back in time, so the most relevant data for assessment purposes is what has been collected in recent years, and this information is limited. This is a hole we are beginning to fill, and this is part of John's program.

Todd: we have a bit of a chicken and egg situation. Is the 100:1 solution standard?

Bruce: this is an objective we came up with by moving backwards. We looked at our targets and worked out the solution we needed to meet that. We're being protective.

Todd: so in that case, shouldn't the guideline be applied before the water comes out of the diffuser? You're applying the guideline to a variable distance after release.

Bruce: two things here – discharge criteria and receiving environment criteria. We have designed the system to meet effluent quality criteria that are achievable using proven technology. These criteria are different from receiving.

Rudy: we cannot achieve guidelines in the effluent which is why we have a mixing zone.

Alan: so the size of the mixing zone determines how you meet the guidelines.

Amy: the trouble is the mixing zone was set by a target, rather than guidelines on how large a mixing zone needs to be. Have you done the survey to know if that affects fish habitat?

Bruce: there was a sediment survey done to define the area with tailings in Back Bay. There has been some sediment sampling done and benthic surveying. There is some elevated arsenic content in the sediment. The benthic abundance was quite low for the area. It's not great habitat for any of the fish species, though our biologists rank it as marginal to moderate. Part of our program is to go into the area and do more studying.

Alan: we tend to look at the edge of the mixing zone and see that as the end result of the project. I also look at it as the mixing zone, where you are exceeding your limits. So, is the mixing zone part of the lake where you exceed, or is it part of the project? I'm struggling. Do you count the mixing zone as part of the lake?

Daryl: every water project has done it this way, and you have to be careful not to take it to extremes. For example, we could have no diffuser and release directly making the whole lake a mixing zone. It is up to the Board to decide if the mixing zone is acceptable. We call it the "interface" between the project zone and the end result.

Bruce: effective mixing is crucial for several reasons.

Simon Toogood: how will the effluent criteria for the WTP be determined? Not end of pipe, but raw effluent?

Bruce: it's based on Best Available Technologies, and again from working backwards from our targets.

Rudy: an evaluation was put together as part of the bench-scale testing to ensure that we could achieve a level of 0.2 and we have been working toward that.

Kevin: IR Round 2 AN 07.

Todd: can you put that evaluation on the registry? We asked for that in IR Round 1 YKDFN

Mike: I can check into that.

Kevin: is the column being presented what the developer intends to submit as the EQCs for the water licence?

Bruce: we are not suggesting these are the criteria that are going into the water licence application.

Kevin: when do you get around to proposing water quality for the Water licence, so where are you going to measure, as it leaves the WTP?

Bruce: this is not part of the EA, its part of the water licence.

Daryl: it's not the proponent's job to tell the Water Board what the criteria should be for the licence, but these numbers are in line with what the Water Board might determine.

Anne: objectives at the end of the mixing zone will be backtracked to determine effluent criteria, and in the case of the proposed mixing zone, and this can be done as part of an EA.

Rick: it might be helpful for the Giant Team to compare these levels to their current effluent levels.

Simon: how would you characterize your background levels?

Bruce: I would not suggest that Back Bay is a non-impacted environment, and we've done sampling in YK River as a comparison as well, and the average arsenic level was about 0.26 micrograms per litre so we're not far off the arsenic level measured in the bay of 0.4 micrograms per litre in the winter survey.

Kevin: we had identified nitrate as an element of concern; where are you at with that?

Rudy: we do not anticipate Nitrates being an issue based on our monitoring of the mine water.

Kevin: are you worried that flooding of the mine will affect these levels? I have a concern about sulphates and it's not on the list, and my understanding was that sulphates coming out of the mine effluent are high.

Rudy: I will check on that.

Todd: is the plan for the mine water level to stay at 750 feet for the foreseeable future and what is the timeline for the "foreseeable future"?

Daryl: we have discussed this and it's not completely resolved. "Foreseeable future" would be for the next several years as we go through the freeze phase. This is tied to design and the freezing system. There is a cost of maintaining water at the 750 foot level and if there are no benefits, we may not keep it there. There is also a possibility of allowing the water to rise and flush out contaminants while this generation is around to treat it. We need to have the design nailed before we start making these decisions. Our approach to the pipes will factor into this.

Rudy: if we do something in the future with the water level, there is provision in the plan to deal with that water.

Kevin: am I hearing that if the design work is all hunky dory, the mine water might be allowed to rise to say, 250 feet?

Daryl: we wouldn't allow water to rise to the pit level until we are absolutely sure that there are no water quality issues. We want to keep the water low enough to allow remediation of the stopes and then allow it to rise. We expect some high test when we first flood, and the treatment system is laid out to address any contamination in that water. We hope this won't be necessary, and that over the decades, the water quality will improve.

Kevin: what will raising the water level above the blocks do to their thermal integrity?

Daryl: we have looked at that and determined it will not be an issue, as we have an abundant cooling capacity and the water is not flowing fast enough or warm enough to have any impact. We addressed this in the R1 RB IR 03 response. The high test idea is difficult. We've been able to sample water from all parts of the mine and that sampling has formed the basis for our hypothesis about high test.

Rudy Schmidtke presenting on water treatment.

Kevin: where will you landfill the sludge?

Rudy: it will go into a dedicated landfill. It is currently in a settling pond.

Kevin: will you drain that pond and put in an engineered cover for that pond?

Rudy: yes and there will be a separate cell within the landfill dedicated to sludge.

Todd: what are the sludge volumes you are looking at per year?

Rudy: we have that information and will get back to you on that.

Simon: what guidelines are you using to characterize the waste? You reference the NWT guidelines.

Rudy: TCLP – Toxicity Characteristics and Leaching Procedures. We are following NWT waste regulations. We classify the sludge as hazardous and non-hazardous, and as it is non-hazardous, we can use the NWT waste guidelines.

Anne: how much high test waste do you anticipate?

Rudy: we have a plan in place to characterise that on a seasonal basis, we estimate it will be quite small and located in small pockets underground.

Anne: will sulphate be added?

Rudy: and addressed.

Alan: on slide 4 you compare pre-freezing to the post-freezing volumes. What is the difference?

Rudy: pre-freezing it is what is happening now, and the numbers listed in the slide as DAR are numbers submitted in the DAR, and the other numbers are the new numbers we have now based on our modelling.

Other Outstanding Issues

On R2 YKDFN IR 2

Todd: we requested an [AANDC] org chart and did not receive a response.

Kevin: including location of staff is also important. We also want a both a current org chart and a hypothetical org chart for the perpetual care phase.

Mike: we will get back to you tomorrow on that.

On Oversight Committee Summaries

Kevin: Oversight Committee summaries – we did not receive all of them; where are the missing ones?

Adrian: there hasn't been a meeting in the timeframe you are asking for; i.e. since October 2011. We confirm the earlier commitment that future summaries will be made public; but I currently don't have a response as to how specifically the summaries you are requesting will be made public.

Kevin: we asked for May 4, 2011 summaries

Adrian: I was pretty sure we provided that [May 4, 2011 Oversight Committee Summary] but I will check into that. We can take this conversation off line.

[END OF DAY 1: JUNE 27, 2012]

AGENDA ITEMS: DAY 2

Note that the agenda was adjusted somewhat to accommodate afternoon schedule conflicts of some of the workshop participants.

2.4.Surface

- Future land use plans and involvement of partners in process
- Status of tailings cover trial
- Air quality assessment update

Bruce Halbert, presenting on CALPUFF Report

Outstanding Questions on Surface

Todd: for the particulate matter this is over the course of a year. So in terms of your sources, how is the material available to be picked up by the wind in the summer time; and if we consider the summer or non-snow/ice period, how would that affect this air quality isopleths?

Bruce: they will occur in the summertime, as that is when you have the greatest likelihood of emissions. Every activity for dust has a source, e.g. an excavator dumping into a truck is a source, as is that truck moving down a road, or dumping operations; all these are quantified and inputted into the modeling. In winter, reduction factors are taken into account, e.g. road dust.

Todd: I ask because 2-3 weeks ago we had a big north wind, and there was a significant dusting event, and that was in the absence of any real activity. Is this a source?

Bruce: yes natural occurrences are also a source for our modelling. When winds reach a certain level, (greater than 5.4 metres per second) dust picks up, and we have included that in the modeling. That includes wind erosion of the exposed tailings area surfaces.

Kevin: in an earlier table you said you looked at building demolition as sources. In Table 3.2 in the report you talk about the roaster, and there's a note in the table that discusses emissions from demolition of the roaster. How realistic is it that you'll be able to contain all emissions from the demolition of the Roaster?

Bruce: the building will be decontaminated prior to demolition. During the decontamination phase, the building will be kept under negative pressure, the contaminated material will be containerised, and moved out of the building. The demolition, which includes cutting concrete, for example, will emit what we call inert dust, that is, dust that does not contain elevated levels of arsenic.

Kevin: so the assumption is that there will be no arsenic released during the demolition, how accurate is that?

Rudy: the building will be decontaminated before demolition, and there will be monitoring stations set up to ensure there will be no release of arsenic.

Kevin: the 0.3 mg per cubic metre arsenic criteria, is that an Ontario criteria? There is no CCME standard? Are there other jurisdictions that have criteria for arsenic?

Bruce: we frequently use the criteria for Ontario, though there are likely other criteria. There are no CCME criteria.

Kevin: regarding the rationale for the receptor points, why are there none located in the lease area?

Bruce: we modeled public exposure. Workers on site will follow safety guidelines for working with the contaminated material.

Kevin: when I look at the large area, surely during this activity, there will be people walking around this area…

Henry: this falls under labour laws and legislation that govern contractors and safety of employees. Any worker on the site will be under the administration and oversight of ourselves and other jurisdictions.

Kevin: does NWT WSCC [Worker's Safety and Compensation Commission] regulate arsenic exposure for workers?

Henry: exposure to arsenic will be dealt with as part of the health and safety plans that will need to be approved by the party with jurisdiction over health and safety of the workers.

Octavio: the Occupational Health and Safety legislation includes acceptable levels for a number of substances and the requirement is that a job safety analysis will be done for any particular activity, which includes acceptable exposure levels and the requirements for contractors.

Kevin: I do note that there are areas within the surface lease area where workers will be. There is also a public highway that goes through the site, people walk, drive, and bike along there, and they will be in the area of contamination. They will get exposed to this stuff if it exceeds the criteria.

Bruce: those exposure levels will be short, and when exposure levels are high, we will be taking measures to reduce risk.

Henry: dust suppression is part of the activities on site.

Kevin: I want this concern noted on the record that a public highway runs through the site and there is a risk to the public for exposure to levels that exceed acceptable limits.

Alan: you mention that at some times there will be people on site - I think of the multi-sport club and their teams of joggers. You say there may be minimal health effects, but you are the modelling guy, not the health guy, so what happens when those joggers happen to be onsite when every exceedence

occurs. If Kevin is concerned about this, it would probably be a good idea to have a response to this for the Public Hearings, as this could matter to the public.

Ray: we have stated on the record that the highway will be realigned to move traffic off the site. The timing and the relocation of the alignment may not eliminate the potential for exposure, so what we need is some sort of assessment of short-term exposure for the public during potential exceedence.

Mike: is there potential for any health risks arising from mitigation measures.

Alan: someone should do the math on this.

Henry: we also include mitigative measures during our contracting pertaining to containment of contaminated material. We can clarify some of those measures.

Bruce: we can also do the calculations for exposure to someone on site for health risks.

Kevin: you say you will be monitoring the site for air quality and in the DAR you identified some of the sites you may monitor, and if you have some sense of those sites, that would be helpful. We would also like to know the trigger points that will cause action to be taken. The last paragraph of the Calpuff Report discusses mitigation activities; we want to know what the trigger points are for when you're going to do these things. The EMS working group will be involved in this process but I want to know when you're going to close the Ingraham Trail, and when you will stop public access so you don't get people inhaling this stuff. This is the kind of detail you need to have so that the public has some assurance that they will not be exposed to this stuff.

Bruce: part of the detailed plan will be determining how we do the monitoring. It's not a static program; we can move our monitoring sites around and adjust them as necessary.

Henry: areas with the potential for exposure will be managed and the contractor will have rules that govern how they manage the site and ensure the safety of the site.

Kevin: we haven't found a safe way to maintain the site during past activities, or during current activities, so the safety isn't there. How much do you want to do during the EA versus waiting until the regulatory phase? I want you to commit to doing something now to ensure public safety. You haven't addressed this since October and this is going to come back at the Public Hearings.

Ray: there are activities happening on site to manage dust. I think the only permanent solution we've heard is to cap the tailings. Until they are capped, there is going to be dust, and there is no way we are going to be able to completely eliminate dust until that cover is established.

Todd: you have air quality monitoring happening right now, what is the turnaround for the results, and is there a website where you can post this stuff so that people can check the website before they head out across the site?

Bruce: The monitoring program described in the DAR is a standard air quality program based on collection of 24-hour samples every six days. To provide the information you are asking for would require real time monitoring. This type of monitoring will be considered, during the detailed design phase, as well as where the monitoring will occur. However, this is not part of the EA.

Kevin: I disagree; I think this information should be part of the EA.

Adrian: Chapter 14 of the DAR discussed monitoring activities. The level of detail you are requesting does not exist and will not exist until the design details have been determined.

Octavio: the EMS Working Group will be part of the discussions on a site-wide monitoring program and job specific monitoring requirements. We are working together to determine trigger points, actions required, etc. and these will influence the criteria we will require the contractors to meet. I suggest we need to continue that process.

2.5. Baker Creek

- Analysis and Current Plans – no diversion of Baker Creek
- Short-term risk assessment and mitigation
- Further investigation
- Contingency planning

John Hull, presenting on Baker Creek

Outstanding Questions and Discussion on Water (continued)

Alan: is the Reach 3 Design Variant on the public record other than in presentations?

John: it was presented in the Technical Sessions, though it is still under evaluation.

Simon: with respect to the current alignment and the proposed work on site, at what stage are you at in terms of determining diversions - Reach 3 in particular?

John: we are still designing, and in the design phase we will present options and trade-offs for realigning Reach 3.

Simon: have you done cost estimates to determine how much work will be done on Baker Creek? I'm thinking of potential impacts on Baker Creek and whether there will be significant enough impacts for a DFO authorisation. Is it the entire Baker Creek within the Lease area that may be subject to a fisheries authorisation?

Morag: we are still evaluating and we know there are some sections that are proposed to be realigned such as Reaches 3, 1 and a portion of Reach 5 which will require authorisation, and there are other sections, reaches 6, 5 and 2, that are still being evaluated. Depending on what is proposed, they may

require authorisations (sediment management options). We have asked for this information to help us make those determinations, and the EA determinations will assist us as well.

Alan: so, potentially the whole creek may require an authorisation, but we know there will be some reaches that will - and some that may - require an authorisation.

Alan: one of the advantages of knowing the overall cost is to know what kind of scale of activity you are looking at.

Joanna: you have to be careful with costs because cost doesn't always relate directly to scope. And I want to caution against comparing with the DAR, and using percentage of overall budget.

Simon: when are you going to have more specific information required to determine authorisations?

Morag: we won't give any authorisations until an EA decision has been made. We will be conducting our reviews in parallel with the LWB reviews as a lot of our mandates overlap, and we can't give authorisations until the development has been approved. Once the water licencing and land use permits have been determined, then we can issue our authorization(s).

Simon: are there any issues concerning continued work on the liners?

John: the plan is to use till, which is a natural material, so the anticipation is that there will be minimal maintenance required.

Daryl: reach 4 used till lining, and the only place we used bituminous liner was at one of the dykes.

Alan: so, because it's natural material you would require minimal maintenance? What sort of maintenance?

John: because we're proposing natural fill, the fill will require no maintenance.

Alan: for the bituminous liner at the top of the pit, what is the lifespan of that material?

Daryl: best guess is many hundreds of years. For the record, it is difficult to predict the behaviour of a plastic over hundreds of years, so this is partly why bitumen was selected - as it is more tested and proven as long lasting.

Simon: for the proposed freezing, what is the model for the thermal impacts of the freezing on the creek?

Adrian: this is described in the DAR.

John: the only area that may be impacted by the FOS is C2-12, but we have determined there will be enough separation to ensure the creek will not be frozen by the system and the system won't be thawed by the creek.

Simon: what impact will there be on the creek if, in the worst case scenario, a bullet goes through a pipe?

Daryl: this won't be an issue.

Todd: can we get some maps that show the sequencing of the baker creek changes and the highway realignment. I want to know the schedule and what work will be done at the same time. I just want some maps.

Ray: there is no intersection between any activities happening on the highway and Baker Creek.

Todd: can we please have a commitment to provide a small map that shows the Baker Creek realignment and the highway realignment and the schedule for activities?

Adrian: yes.

Kevin: we would like to see the cost estimates for the project, as we have not seen updated costs. I would like to know what the Baker Creek costs are and what the North Diversion option would cost, so we can compare.

Joanna: please explain why this information is important to EA?

Alan: we need to look at reasonable value and people want to make sure that if things are being proposed that reduce risk, it's not off the charts in terms of cost. We've heard from the engineers that cost is a design criterion for things like mitigation measures and monitoring, so we want to know what the economic values are compared to the risk values. It helps the board to understand how you made some of these choices if we can see the costs involved in factoring decisions about mitigating impacts. We need to understand how you look at considerations in your decision-making.

Joanna: the project scope hasn't changed, and I don't understand how the costs have anything to do with this.

Kevin: I want some assurance that the money is there. And I think that's fair to ask.

Joanna: of course cost is a concern, but it hasn't changed the project.

Alan: the project has certainly changed, and you described the cost before it changed, so it's helpful to know what the new costs are now, based on those changes.

Kevin: I want to know what your figures are for Baker Creek, and you already have a rough estimate for the North Diversion, and if those are close, I think that may influence what we want to talk about at the Public Hearings. I want to see the North Diversion option on the table.

Daryl: we can use the same estimates we made for the DAR and we can make new estimates, but there is a concern about releasing a new set of estimates. We can include some of the things Alan is asking for.

Alan: I ask for this because you will need to be prepared for this to come up in the hearing. We're looking for rough numbers that help describe the amount of work in the project.

Morag: this alludes to our concern about our participation, as there is uncertainty about the scope of the project and the scope of the assessment; if there is a discrepancy between what the Board thinks it is assessing and what the Proponent thinks is being assessed. The scope needs to be determined so we have the information we need to assess activities. If the Board is making decisions that will affect what we will be evaluating, we need these to be put out by the Board. The Board is talking about evaluating a component of the project that the Proponent says is not on the table. We have clarity from the proponent – now we need clarity from the Board.

Alan: any information we have available is available on the public registry. What the Board considers is confidential to the Board. The Board is clear that the developer has said the North Diversion is not on the table. We are interested in the costs for the on-site alignment, which is part of the project, and we would like those costs to determine the amount of effort required. We want to know how big a deal it is do the work that needs to be done.

Mike: we also should consider that things like inflation and material costs influence changes in costs, rather than scope changes.

Kevin: is the developer going to provide a new cost estimate for the project, including Baker Creek?

Rick: in the slide about channel design criteria - please clarify where mean annual flows would occur on this cross-section

John: (illustrated location of the active channel and discussed where mean annual flows would occur) we've looked at flows and how the increased flow of water is enough to maintain a channel. When we've finished the shoulders can be adjusted as necessary to maintain flow.

Rick: I know there have been sediment assessments on Baker Creek; when will these be made available and when will decisions be made based on that report?

John: I've been told we're in the final stages of writing the report. When it will be finished, I anticipate in the near future, and it will be submitted to Public Works. I would assume Public Works will share this information with the appropriate parties. The report will provide the data, and then the Project team will make their decision on what to do with sediments.

Morag: so in terms of timing, these decisions will be made in time for the Public Hearings?

John: in terms of where we're at, I would say no.

Rick: my question for the Review Board, if the North Diversion is off the table from the proponent, but can the Review Board put it back on the table as a measure?

Alan: the Board has a range of measures it can require. Is it possible for the Board to put it on the table? The Board can introduce measures to reduce risk but I am not in a position to comment on how the Board will decide on that.

Rick: I am curious, because it is DFO's position that a North Diversion could have its own effects that would need to be evaluated separately.

Alan: slide 5, what does "Probably Maximum Flood" mean?

John: it means that in worst case scenario you would have a maximum 200.

Alan: something our experts have raised: one of the hard things to predict is the activity of beavers or other animals habituating the creek. So, is this an issue that could have effects over the very long term? Have you looked at the probabilities of beavers damming the creek upstream and what the effects would be? Looking at the time span, particularly "in perpetuity", is this an issue?

John: beavers have shown up on site, and have built dams, and we have designed the channel to consider sudden back ups and releases of water. We haven't specifically designed for beavers.

Alan: what about upstream of reach 7?

John: there is enough area further upstream to accommodate such a high water event, though we have not looked specifically at beavers. If it happened in Reach 7, the Baker pond would accommodate this additional flow of water. This is something that the detailed design engineer would have to consider.

Alan: are you planning to periodically look upstream during your maintenance to see if there are beaver dams that could have an impact on your project?

Adrian: right now we are doing some of that, during care and maintenance there are other arms of AANDC that are dealing with this.

Mike: I agree that this makes sense. So we can have a look to see how it fits into the project and it makes sense to look at it, as it is a risk.

Kevin: it's fine for John to say that the Sediment Report will be filed with regulators, but I want a commitment from the Proponent to file the report.

Adrian: I cannot guarantee that it will be ready before the Public Hearings, but it will be submitted to the parties and the public registry once it is complete.

Shannon: regarding flooding, is there still a storm event that could cause a failure?

John: Something above 1 in 500 could, but currently the data doesn't support more than that. We have used recognized standards for our design criteria. This is for the current alignment, for the future alignment the standard will be the same.

COST ESTIMATES:

Joanna: I have a better understanding of what you're asking for, so we will go back and see what we can produce that will satisfy your needs while still working under what we are allowed to release.

Kevin: if we get the cost estimates at the Public Hearing that is not helpful. I want them before the Public Hearing please. This is something I would consider asking the Board to make a ruling on.

Joanna: Something will be provided in advance of the Public Hearing.

2.6.3M (Monitoring, Maintenance and Management)

- Consultation and Engagement (Follow-up on public engagement meetings of May 8-10)
- Update on EMS (including meeting previous week)
- Update on oversight
- Perpetual Care and AN/YKDFN work to date
- Future land use plans and controls
- City permits

Presentation on 3M by Octavio Melo

Outstanding Questions on 3M

Todd: Giant as a project has done a much better job this year than before, and it seems like there's a new approach being applied. I agree that the GMAC is showing a lot of promise and it will be the primary engagement vehicle moving forward.

Kevin: I think there has been some progress, particularly on the working groups, and the environmental management group, we look forward to a contribution agreement that is in the works, it's very helpful. The oversight working group has a lot of promise, we have a great facilitator in David Livingstone and it's good to have Ray, Octavio, and Adrian involved, as well as folks from the south. One thing about the public sessions, there was only three days notice, and we found out about them in the newspaper, so you need to find a better way to promote those events, there is a lot of interest in the project from community members, so you need to find a way to inform people better of these events.

Todd: one concern is that we see a lot of project personnel turnover, and these are all relationship based understandings that are being built. Whoever replaces Octavio will have to work to re-establish what he has done. This is a personality driven process, and you should keep that in mind.

Joanna: to maintain some continuity, I did meet with the Chiefs and it was important for them to meet some of the other faces of the project. We will do our best to keep moving forward and maintain our relationship in the interim to meet the expectations of the communities.

Alan: the Board is encouraged to see the progress that has been made especially in terms of oversight, and there has been a good level of effort made to work together and we look forward to seeing more signs of progress moving toward the Hearings.

Kevin: I said that this […the Oversight Committee…] is the hill I'm going to die on. We want to know where this is going in terms of the Hearings and I think that we cannot have a final agreement before the Hearing, we will need to see some of the decisions and recommendations made by the Review Board and see how they will be incorporated into this agreement. I think if we are going to work together to get some things resolved before the hearings, which is what we're working toward so we can provide an update to the Board at the Hearings on what we've agreed upon and discuss what we haven't.

Ray: that is what we're working towards and we recognise that there are some limitations, but I am very confident that we can demonstrate at the hearings that some substantive progress has been made.

Adrian: regarding the Technical Reports, are you going to be looking at a response at that point? We will be providing an update at the Hearing, but procedurally, how does the timeline work in terms of Technical Reports, responses, etc. - so we are not presenting new material at the Hearings but using them to resolve any outstanding issues.

Todd: a joint submission may be possible in terms of this particular theme.

Alan: you could give a submission similar to your response to R3 IR 3. In regard to the timeline, there will be a deadline in August for presentations, and the Public Registry will close before the Public Hearings so that new information cannot be presented at the Hearings. The Pre-Hearing conference will be an important milestone in determining this.

Adrian: as soon as we get direction from the Board, we can make sure our workplan aligns with the timeline.

Kevin: there is a workplan for the working group.

Todd: is there a procedural mechanism to leave the registry open for information that has been promised?

Alan: the Board is interested in knowing where things are at, and can open the registry for particular material that has been promised. It needs to know what's coming.

Octavio: we can provide an update on progress by July 11.

Adrian: there has been a lot of good work, and I just want to make sure we're all on the same page in terms of timelines.

Todd: R2 YKDFN IR 05 – we did not get an adequate response to our request. Rather than having a prescriptive approach to what is going to be released, I would like to enshrine the type of information that will not be released. The ATIPP process is slow and cumbersome. I think it will be useful to have information about what is not going to be released, and have a discussion about that. We understand that financial and contracting information can't be released, but what about policies?

Adrian: I need to understand what information you're looking for and what you want rather than taking everything and trying to figure it out.

Todd: example of the SSP (Site Stabilization Plan), which is information that should have been made public early on in the process. There's this closed door process and the Government of Canada keeps information to itself, and our concern is that the GoC's release of information is going to get worse. It would be good to get some idea of what are the GoC's policies on releasing information.

Kevin: I've found that ATIPP takes too long, and a year and a half later I'm still waiting for information to be released. The ATIP system is broken, and if we have to rely on ATIPP, we'll never get the information, and if we do get it, we won't get it on time. I agree with Todd, and I think the place we can start to flesh this out is in an environmental agreement for the project; where we can spell out what things are automatically public, and what needs to be confidential. I prefer the default of things that are automatically public. When I see ATIPP listed in a response that sets off alarm bells because that process is broken and doesn't work anymore.

Joanna: we are suggesting that you don't have to use ATIPP, but that the same criteria would be applied.

Adrian: the intent of this IR response was that the filters applying to ATIPP would be the filters that apply to what we can release.

Joanna: the challenge in requesting early drafts is that the thinking captured in drafts doesn't always represent the positions and thinking of the Project. It is at the discretion of our ATIPP officers to make those calls about releasing that information. For example, information that hasn't been Q A'd can't be released. We have to be very cautious of releasing this sort of information.

Todd: OK, so how do we resolve this?

Octavio: the Oversight Agreement in Principle might be the vehicle for trying to resolve this.

Kevin: I agree that the process to work this out can be done though this agreement. Now I want to ask about the SSP; we've asked the Review Board to compel the production of this information, and we're finding out about this through information releases from the MVLWB public registry rather than from the proponent. I want to address that. This is not how the process should work. I want to discuss this further, especially the concept of pulling the roaster demolition out of the EA.

Kevin: Round 2 Review Board IR 07 – the second response talked about how all key GoC documents will be provided to the national library and archives collection, and you talked about examples from Nuclear Waste Sites in terms of dealing with information for future generations. Have you spoken to the Library and Archives about this?

Adrian: we have project team members looking at management data now and in the future, but we have not contacted them yet. The priority now is digitizing records and information.

Kevin: I have a document I will file with the Review Board, it's from a French Agency on Nuclear Waste disposal records, and it details the type of paper and the format for records management for their activities. It's about preserving a collective memory for future generations. This is the type of things we had hoped to reach before the end of the EA but we realise it won't be. This is the sort of thing we need to include in a plan for perpetual care, in terms of what that plan will look like and how it will be managed. You are proposing a perpetual care project but you have nothing on records management, nothing on future generations or future controls. This may be something the Oversight group can work into an agreement, but the EA considers the aspect of managing this site forever. I will file this information with the review Board because I am amazed at the work they have done, and we haven't even scratched the surface. When are we going to get to this, and how?

Octavio: the records being generated now are being stored digitally in our CDM system, so this buys us a little bit of time to develop the records you refer to. We are currently digitizing the old records and we need to make sure that everything is being stored and updated. The program as a whole has been thinking about this, and I will provide a copy of the report that discusses our thinking on records management – we will check the status of this document and it should be finalised and submitted to the Public Registry before the Hearings. It doesn't address management 1000 years into the future, but it does lay out our current thinking.

Alan: this is new ground for the NWT, as we have not received a perpetual care project before and there are a number of these occurring around the world, so we are interested in your approach. We have been looking at documents such as those provided by nuclear waste management projects. These kinds of timescales are a challenge, but they are the ones that need to be considered when you're proposing perpetual care projects. This is an important thing that the Board is going to be thinking about in the Hearing.

Daryl: I think the most honest statement about perpetual care is that a lot of groups around the world are thinking about it and there are a lot of good ideas coming from many sources. There are always lessons to be learned from other areas of thinking, but I think you want to be cautious about suggesting that the Project Team is deficient on this. For example, one of the things we considered in our frozen block studies was how do you determine failures over long timespans. For example, there's always a risk of an invoice not getting paid and a pipe not showing up, or someone being on medical leave and not signing the paper work to approve funding - delaying something by a year. Another example is if war is declared and funding is redirected for ten years. Risks like this occur, and we considered these risks

when looking at methodologies that will be most suitable for perpetual care. We selected an option that would best address these risks. I will look up this supporting document and provide it to the parties (it is on the registry somewhere).

Paul: was what you just spoke about done before the scoping hearings?

Daryl: yes, this review would pre-date the scoping hearings.

Kevin: I differ in opinion on how the alternatives were developed and evaluated , but I brought that up in the scoping sessions.

Daryl: I propose this project does have things to learn about perpetual care from other sources. On the Nuclear Waste Management side, I disagree somewhat on the robustness of the records management of Nuclear Waste management programs.

Kevin: this group in France has done a lot of work, and on records management alone they have 60 linear meters of paper records alone, and they do not rely on digital records as they do not assume that everyone will have the technology to read them in the future.

Daryl: nuclear management follows slightly different guidelines in that they have mining guidelines as well as nuclear guidelines, which consider the 10,000 year timeframe, and I encourage us all to look at nuclear waste examples as we move forward in our designs.

Joanna: I agree that as a project team we are always learning and continue to consider the long term management and maintenance of this site.

Kevin: I just want to emphasise that there is nothing on the Public Registry that discusses your position on records management, and you talk about it but you haven't shown us anything.

Joanna: this is constantly building and evolving and this will be part of the EMS. All I can do is commit that this will continue to be a component of the project moving forward.

Kevin: how and when do we get to the development of the perpetual care plan, what does it consist of, and how will it be reviewed publicly? We don't have enough to work with at this point, and there may be another EA of the perpetual care phase of this project.

Daryl: we have covered off the activities of perpetual care, but I think the crux of your issue is management of perpetual care, and how we will manage our information into the future.

Kevin: we had a workshop on this in September, and we have been submitting information to the Registry that we will draw upon in our submissions in the Hearing.

Daryl: we are always thinking about this, but I admit we do have lots to learn. For the EA right now, we looked at the technical aspects first; this may be my bias as an engineer.

Joanna: we need to implement the project to minimize the long term risk, agreeing that we need to have a management plan put together over time.

Kevin: I agree you've done a good job on the engineering side, but on the social and perpetual care management, that work isn't there. Where's the plan for how we're going to take care of this site forever?

Daryl: one thing I should mention is that at the end of the day, when all things fail, it's the Federal government that picks up the tab. Most private companies have great plans, but when they fail, it ultimately falls onto governments to step in. In this case, the government is the proponent right off the bat, so that needs to be considered. Still, there are ways we can improve our knowledge.

Todd: what is the step forward, as this seems unlikely that this will be done by July, so when will it be done? What is the mechanism?

Daryl: I think the EMS systems will set us up for a better dialogue on what we need to address.

Adrian: the big thing we're struggling with is how we do this within our system, and how we bring in the parties. These discussions will naturally progress through the working groups, the Oversight Committee, and the licencing phases.

Octavio: I agree with Daryl that this is an area that requires further work. The idea is that after a date where an agreement to work together is signed, we can move forward with a process for doing this. We need to discuss the when and how, and these are important details. One process has been identified, and we need to move forward.

Daryl: we did do a review of other mine sites and communities with long term management and as long as something is a contaminated site, it loses value, but when an area becomes one of value to a community, the community is interested in its care and maintenance. You build an interest in perpetual care. An example is a forest in Germany where they wanted it created on the covers because it would be of value, and they knew it then would be maintained. Good uses might be one of the best guarantees for perpetual care.

Kevin: I don't know what else we can say on this matter. What can AN say to the Review Board in terms of asking for recommendations to make sure this work gets done? We can move on to a different topic - money. The Review Board asked in an IR about funding for perpetual care. We sent a letter to the Review Board expressing concern about the response from the proponent, and that it did not address any options for long term funding for Giant. We referenced a report by Pembina and this did not appear to be considered. I would like to know why this response did not reference that report, and why the developer does not want to make a commitment in this area, because it's important.

Joanna: perhaps we should have referenced this report because it was considered. I think the Pembina Institute did a good review, but the examples in there, while interesting, do not draw a direct link. But

they will inform the discussion moving forward. There is a broad base of participation going into this and this will be reflected in our internal GoC discussions. In essence, the Federal Contaminated Sites Action Plan (FCSAP) sets aside money by the GoC to address contaminated sites. It's a similar idea to trusts, in that the government sets aside money. Once we have a project, once we're through EA and detailed design and certainty of costs, there will certainly be dialogue in the GoC about that project and its requirements over the decades. The long term costs are going to vary as we go through implementation, and at each phase the costs will continually be considered. What we have here at Giant is a human health and safety issue that will not be ignored.

Kevin: I see words like "potential reconsideration" and there is no timeframe, or commitment to collaborate, or a firm commitment to examine alternatives or evaluate them, so I don't get a sense that you've moved ahead on this issue.

Joanna: there is only so far we can go on this issue, and once we are in a long-term management phase, that might be an appropriate time to look at a funding arrangement. We just can't define that currently.

Kevin: I am starting to understand the constraints of working under the Federal government, but it's just not good enough for the community. If our interests are being determined yearly by people in Ottawa, that's not good enough. If the Project can provide a commitment, this will provide some comfort. This needs to be part of a perpetual care plan.

Kevin: I do have a question about city permits. I want it on the record, did AANDC apply for a permit from the city for a development permit for the demolition of the roaster.

Adrian: No.

Kevin: will you be applying? For what permits?

Adrian: we will be complying with all legislation. We spoke to the City of Yellowknife about the demolition of the Roaster and a demolition permit was not required.

Kevin: you will get any building or demolition permits the city asks you to acquire?

Adrian: yes, we will apply for any permits the City determines are required moving forward.

Kevin: I want to make sure that the Project is accountable to the citizens of Yellowknife.

Adrian: we have been meeting with the City regularly to discuss the permits that are required and when they are required. Our project is unique, and so we have to sort out the details of timelines on permits and clarity of process. The current City bylaws do not contemplate regulating a mine, so our discussions focus around trying to figure that out.

2.7. Failure Modes

- General overview

- Will be built into preliminary design documents

John Hull presenting on Failure Modes:

Outstanding Questions on Failure Modes

John: presentation is a recap of a previous presentation [at Technical Session in October, 2011] with some additions and updates

Alan: considering that it's an in perpetuity project, how does this affect your probabilities? How do you work out the likelihoods of risks when your time is unlimited in the long-term?

John: we would predict that every thousand years, incrementally, a certain number of events would happen.

Alan: what about glaciation? How do you work out your probabilities?

John: this wasn't reviewed and evaluated in this assessment, and will have to be looked at as post-closure moves forward.

Ray: I think this chart illustrates that as the likelihood increases - you need to move towards decreasing severity. If you get to a likelihood of one - you need to reduce your severity rather than leaving it as a high.

Alan: let's say you have someone come along who shoots up the thermosyphons, and nobody is around to fix them, and then you have a flood after that - how do you factor for those 10,000 years from now?

John: how do you factor every possible event?

Alan: we need to address issues like glaciation and its consequences.

Ray: we have to consider that there is no soil up here that would be affected. During the last glaciation period our soil went all over North America and was widely distributed. For all we know next time we'll be the end of the glaciation and everything will be dumped here.

Kevin: what I take from this is that traditional risk assessment has difficulty dealing with issues of perpetual care. Other folks have found creative ways to deal with these issues - USA, France - and have started developing scenarios and thinking things through. That sort of thinking needs to be applied to this project and we're not going to get that through a traditional risk assessment.

Bruce: you can't compare nuclear waste to arsenic trioxide - it's comparing apples and oranges. I'm not disagreeing that there are some concepts that can be looked at and used and we should always be learning and looking at new ideas. We just need to be careful of our analogies.

Kevin: A comparison of the arsenic trioxide with nuclear waste is a fair one. Nuclear waste has a half-life while arsenic trioxide does not. The arsenic is a non-threshold carcinogen. It's in our backyard and might as well be nuclear waste.

Ray: we do need to look at other ideas, but any ideas we put on paper will still present a timeline that the analysis will address. One bracket is the time period in which civil society will be occupying and using the area. We need to look far enough into the future, but not so far that we can't imagine what we can do today to improve the situation in the future.

Octavio: there are things we anticipate to be maintained into the future - the water treatment plant, the frozen block - so there is an expectation at this time that the site will be open for maintenance. The Nuclear industry plans are for adaptive management, so they are continually being updated. It's difficult to think 10,000 years away, but we are assessing a plan today that calls for an onsite presence and for adaptive management. What happens as that devolves over generations and generations is a challenge that we in this room are struggling with.

Kevin: AN IR 25 response indicated that there was more risk assessment being done on the B1 Pit subsidence and Baker Creek, but was there a document generated for this, was the FMEC revised?

John: the Risk Assessment covered the potential for the collapse of the pit and potential flooding of the mine. The risk to Baker Creek was discussed and concerned the increase in the height of the dyke to make sure it is high enough. The analysis discovered it is not the collapse of the mine that caused the sinkhole, but a lack of fill.

Kevin: was the FMEC document changed from what we saw in October?

John: no.

Kevin: "The project team committed to conduct a risk workshop…" when is this workshop going to happen?

John: the workshop has not yet been scheduled, and no date has been set.

Kevin: you made this commitment in October, and there's still no sign of a workshop nine months later. So you do some more thinking about B1 Pit, and subsidence, and Baker Creek, and the way we find out about it is through an IR. I hoped you would find a more collaborative way to inform the parties and the community about what the risks are. This question is for Adrian and Octavio and Ray; you made the commitment and nothing has happened.

Todd: the add-on to that is that Daryl had talked about having a fourth line in the Risk Assessment matrix, which is the Aboriginal view on the risks and severity. There was discussion about doing this for the more relevant interests of First Nations, and I don't know what the plan was, but it was discussed.

Octavio: obviously we still have more work to do on engaging the parties on the project. We've had discussions with Mike Nahir on risk assessments and there is a process that people are used to, so the question is, "how do we involve aboriginal participants?" Is it a workshop, is it preliminary assessment? When do we capture traditional knowledge? It is a work in progress, and we need to pay more attention to it.

Adrian: I ask this question deliberately – we have limited resources on each side, so I ask again, what are the priorities? We need to prevent burnout, so I want to know how we should dedicate our time with the Parties so we can get the most out of both sides. Do we set aside two or three years to hammer this stuff out? I truly do want your input so we can dedicate our resources appropriately? Recently, we focused our efforts on oversight; was this a mistake? Were we incorrect?

Todd: I think oversight was a good track, but where are we with all of it? We've arrived at a framework that we sent to our bosses and were supposed to come back and negotiate. The YKDFN are on board and would like to move it ahead.

Octavio: AANDC felt that the joint submission to IR 03 was a good sign of moving forward.

Kevin: Joanna did indicate that she personally supported the framework and that we need to keep moving. I haven't lost the concept of identifying our priorities, and I will need to go away and think about this. We need to get as far as we can [before the EA hearings] in terms of our discussions on an environmental agreement, and I understand there are a lot of competing priorities. I will not be going away though, and I will hold you accountable for the commitments you have made, and I will make sure they have the attention of the Water Board and are carried out.

Adrian: I want to emphasise that this doesn't end with the public hearings and we will continue to work together moving forward. So please keep in mind a plan and priorities for work to be done over the next two or three years; we want to hear that too. We want to know we are talking about the right things at the right time, and be sure that we are correct in moving forward.

Kevin: this project was forced into an EA is the only leverage we have right now. As much as the people in this room trust each other, we prefer an agreement in writing that is enforceable and lives on beyond the individuals who came up with it. We have limited time and we need to focus on the tasks that need to be done before the Public Hearings.

Kevin: R2 AN IR 17 – talking about worst case scenarios, we asked how would an emergency situation be communicated to the public? We had this situation with Baker Creek last year and that was a communications disaster. I was getting calls from people in the community who were confused and there was mixed response to the media. The response said that AANDC communications would handle it, but I want to know if you have a MOU with the City, and if you don't you need to develop it.

Adrian: we learned a lot from what happened with Baker Creek. We do not have an MOU, but it's an interesting idea and we could look into it. We have learned a lot and changed our protocols to

accommodate correcting the mistakes we make with Baker Creek. Now, if it goes to the press, it will come to me as a spokesperson. We had an event in the spring and gave the media an advisory, but I don't know that they all printed it.

Octavio: the internal project management committee has looked at emergency procedures and part of our care and maintenance gap analysis we are doing this summer will review those procedures. This includes the chain of communication from the contractor to the responsible authorities. Actions to fix the gaps will come out of that analysis.

Kevin: will this happen before the end of the EA?

Octavio: we will have preliminary work done in August, but there will not be a formal report on this in time for the Public Hearings.

Ray: please clarify, is Kevin talking about a plan for communication, or an emergency response plan? I ask because each component of the project has a response plan.

Kevin: I don't need to see the arrangement you have with your contractors, but I assume you will have some sort of framework for that and how you will communicate this information to the public. I am concerned about the public. I know the City has a protocol in place for emergency situations.

Ray: so you're focussing more on how the Project team connects to all the external resources available during an emergency situation?

Kevin: I just want to know if there is a plan or a protocol or an arrangement with the city for how to respond to an emergency in terms of the public.

Ray: this is all being covered in our gap analysis and audit that we are doing now.

Kevin: you need to establish the connections between your team and the public. The public needs a point of contact so information can flow back and forth.

2.8. Tailings

John Hull presenting update on tailings:

Proposed design cover for tailings assumes 0.7 m of silty sand and 0.3 m of gravel; this needs to be confirmed in the details of the design. We need to account for erosion. The work on the test pad is to create some shallow test pits on the cover to determine if any migration between the sand and gravel layers has occurred, and reduced thickness assumed in construction. If so, adjustments will be required to the design. We will use the test pads to confirm. Pads will be left behind so if further testing needs to be done, the test pads will still be in place for this to be done, though no further testing is part of our current plan. Some work has been done on a vegetation study, though this is preliminary. Two tests

were carried out on vegetation, but I have yet to locate any documentation on these studies. Grasses have grown. Vegetation can grow on the tailings, though this is not the intention of the design.

Todd: earlier you said you needed vegetative layers to stabilise, where are you vegetating?

John: to clarify, vegetation will not grow on the tailings, but on the covers of the tailings.

Kevin: I understand that the test pads are in the Northwest pond. One is submerged.

John: one is underwater at the moment, and the other one, closer to the 21-C dam is above water.

Kevin: what information do you get out of a submerged test pad?

John: test pad one has been monitored for three years. We got data out of the other one for one year, as it has been submerged for two years now. So yes, the results would be meaningless from the submerged pad.

Todd: so the objectives are to study stability, and…

John: we also wanted to test the settlement of the cover into the tailings. It settled about 15 centimetres. The key was: does it disappear, and it has not so far.

Amy: I have a concern about thickness of tailings cover. If it's supposed to be permanent, then it doesn't make sense to have something that can be ruined simply by a tree growing, so monitoring vegetation is required. Does the cover need to be bigger?

John: intent is that the cover is designed to prevent infiltration, and our basic cover design addresses key points. If the planning for future land use requires adjustments to the design, they can be accommodated then.

Shannon: I recall the tailings cover being a meter or so of cover and then a rock layer. I don't understand how a meter of gravel can act as a capillary break.

John: we've selected the most viable option. The break acts as a barrier for water coming up – if there's no water being pulled up, then the tailings pore water won't saturate the cover material. (Ray uses the example of growing a plant in a pot of soil versus a pot full of marbles).

Bruce: the weight of the gravel will not raise the layer of the tailings, but consolidate.

John: the studies showed that the water table is several meters below the tailings to begin with. The ponds will also be drained of water to prevent tailings pore water from rising.

Kevin: I asked for the field trial design for the covers in the first round of IRs, and it sounds like there have been some advances in the design, so it sounds like you are moving towards selecting an option. I think it would be helpful to put that on the public registry; some sort of note about the numbers you're

looking at. This will be useful information to have so we know what the design looks like and what it's setting out to achieve - just a quick memo.

Adrian: I will talk to Mike Nahir about how we can get that done for you in a timely manner. I need to talk to my team about how and when we would be able to get this out.

Ricki: DPRA will be capturing in this workshop summary the reports the Giant Team has committed to providing.

Todd: how many options did the test pads look at?

John: we looked at two options: one a combination of gravel and silty sands, and another of just rock. We are currently testing to see if a geotextile membrane is needed or appropriate. If it is, then the detail designer will have to look at how its performance will affect the overall performance of the system.

Kevin: where did they put the geotextile liner on the test pad? Are you checking on the performance of the liner?

John: they put it on the bottom, and yes that is why we have the test pads.

Bruce: want to clarify that geotextile is a layer, not a liner. It is a construction component.

Alan: so you have plans going on 150 years in the future, what is going to stop foreign vegetation from breaking through?

John: the vegetation experts tell me that with no water, the capillary break will cause roots to grow sideways, not down.

Alan: there must be some documentation around concerning the original intent of the test pads; you said you couldn't find any…

John: I do have that information somewhere but just not with me, and I can look it up.

Rudy: there may be areas where some things are required and some aren't.

John: there are places in the tailings where they are drained and it's very stable, and we can construct good covers without requiring geotextiles for stability in construction.

Alan: one more thing, for the sake of perpetual care, if you're tailings cover isn't working, what does it look like? – [makes connection back to this "narrative of failure" concept discussed the previous day]

Rudy: noticeable wear and tear would be an indication of cover failure.

Morag: you were talking about revegetation success such as in Reach 4 in 2007. There was a cap on some tailings last year, is there anything in there that would inform cap design? Is any of that informing overall tailings caps?

John: we have been looking at the JoJo tailings cap and how that might factor in and inform the decisions on other caps. We are looking at a method that has been used by DOT in the Yellowknife area, and that data is being collected and could inform designs moving forward.

Shannon: my question could be because of my lack of understanding. The question was about tailings oxidising, and I read that there is a low to moderate risk of seepage of arsenic. I want to know if there should be concerns about moderate concentrations of arsenic.

Adrian: we don't have the technical experts to answer this question, but if you put it in an email, I can commit to have my experts answer that email and it can go on the registry.

3. REMAINDER OF AGENDA

Other Agenda Items

There were opportunities provided throughout the two day workshop for participants to raise and discuss other agenda items. This included, for example, discussion of the commitments in the Alternatives North letter of March 8, 2012 as reported above.

4. Mutual Understanding of Review Board Schedule

Alan: this is to the best of my knowledge – but you should verify this on our website:

- Public Hearings will be held at the Tree of Peace from September 10 – 14.
- Pre-hearing conference is scheduled for July 26
- July 11 Is the deadline for Technical Reports
- We are still waiting for confirmation on the due dates for the Hearings Presentation materials – we have noted AANDC's request for the end of August.
- Public registry will close sometime in early September. Procedure is for the proponent to have a little bit of extra time to get their reports in.
- The pre-hearing conference allows all parties to understand how they will be able to participate in the hearings and the time they will have available. The pre-hearing conference will allow for a teleconference line. Approximately half a day should be set aside for this conference.

- We will need to know what kind of issues parties will be wanting to discuss
- Legal counsel is permitted to attend.

- Dates yet to be released are dates for submission of presentations and dates for closure of the registry.

Todd: can you ensure that the announcement of the closure of the registry is sent out in its own separate memo, so it is not missed?

Alan: yes.

Kevin: I've been asking for this session since March, because I wanted some clarity on outstanding issues from the proponent. Can I ask for the technical reports deadline to be delayed? To be clear, I am not suggesting that the public hearing dates be changed in any way, but that the date for the Technical Report submission be pushed back.

Alan: this will push the entire timeline back and this will cause some significant issues in terms of scheduling for the Board, and have implications for the Hearings timeline. You are fully within your rights to ask the Board but getting the Board together will be logistically difficult.

Todd: I am not in favour of delaying the deadline for the technical reports.

Kevin: I am not happy about this.

5. Key Issues Summary

Kevin O'Reilly read out his list of outstanding issues as follows:

1) Ice thinning caused by the diffuser

2) Effects of air emissions on Ingraham trail users

3) Far-field modelling of water quality in Yellowknife Bay caused by the diffuser – aquatic effects

4) Frozen block design and performance criteria in a report to be filed in July

5) Perpetual Care planning, including long term funding

Todd Slack added to the list:

1. EMS working groups, components objectives

2. Priority is still oversight and how to incorporate that movement within the Board timeline
3. Perpetual Care plan – timeline for when it will get done and how
4. Organizational chart for AANDC roles and responsibilities

Morag McPherson added to the list:

5. Reiterate the process for the note-taking of this workshop and party review of summary
6. Sediment assessment and timing of when information will be made available to parties
7. Scale of mitigations and measures – clarification from review board might be needed

6. Action Items as Discussed by Alternatives North [see also Appendix II]

Kevin O'Reilly read out his list (below) of "commitments", as understood by Alternatives North, made by the Developers that he had recorded over the two day workshop. Some clarification was provided by others on select items.

The reader is referred to Appendix II of this report which provides a list of Action Items derived by DPRA from the complete workshop report. It provides more specific language on the nature of the Action Item or commitment.

1. Developer will submit the updated FOS study lessons learned and development of performance criteria – in July
2. Wetting study progress report – in July
3. Sediment and fish habitat study for diffuser
4. Far field modeling boundary adjustment discussion with City of Yellowknife
5. Diffuser modelling study water quality sampling results
6. Best Available Technology (BAT) findings for water treatment evaluation
7. Look into whether sulphates are a problem
8. Annual sludge production volumes
9. AANDC Org charts including location of position, for both project implementation and the perpetual care phase

10. Oversight Committee meeting summary(ies) missing from those requested (sent an email and want it on public registry)
11. Ingraham trail users study – air inhalation in areas above air quality objectives
12. Project cost estimates - before the public hearings with Baker Creek costs split out
13. Sediment Report for Baker Creek - distributed to the Parties
14. Assessment of beaver dams on Baker Creek (Alan: I understood that they will investigate how this will be factored into the EMS, rather than an assessment actually carried out now)
15. Risk Assessment Workshop between now and eternity
16. Filing Northern Contaminated Site Program report on document preservation and information management
17. Daryl to provide earlier Appendix on arsenic containment which included perpetual care thinking
18. Gap analysis for emergency response
19. tailings cover objectives and design update – by memo
20. Provide clarification of Shannon Hayden's Tailings Cover concerns (once she requests in writing) via email which will be submitted to Public Registry
21. Map with Baker Creek and highway realignments overlay

7. Next Steps

Workshop Summary Report:

AANDC summarized next steps in terms of the Summary Report from this workshop as follows:-

- Meeting notes from this workshop – those being written by DPRA - will go out to all parties at the same time for review and comment and ultimately for submission to the public registry.
- PowerPoint presentations will be packaged and submitted to the registry immediately; as will any reports we have in hand;
- DPRA will prepare and distribute, as part of the workshop summary report, a list of reports the Giant Team has committed to providing; and

- In the near future, the Giant Mine Remediation Project team will prepare a table of reports we have committed to submitting, with approximate dates for when we hope to release these reports.

8. Closing Remarks

Alan: we did some good stuff here, it's not easy territory to cover and it's challenging for the parties to stay on top of the information and it's hard for the team to respond to some of these questions. It has been good to see the issues on the table.

Todd: I am looking forward to my technical report, and I think this was really good.

Kevin: this should have been transcribed or recorded; I would have preferred it be done under the auspices of the Review Board, with transcripts and undertakings and deadlines for undertakings. If you are going to do this sort of session in the future, it needs to be done properly.

I think we made some progress on some issues, but there wasn't much progress on some of the big outstanding issues. Ice thinning, perpetual care, long term funding. We've made some progress on the EMS and oversight groups, and I want to see those exercises move forward. But there wasn't a lot of progress here on some of the technical issues. We need the presentations ahead of time so we can review what is going to be presented. It was not fair to not have the presentations ahead of time. I was asked my thoughts on how this should be done, and I gave it verbally and by email and it wasn't followed. I think you should bring someone from FCSAP (Federal Contaminated Site Action Program)to the Public Hearing to discuss perpetual care of remediated sites as this information is above Joanna.

Thank you for doing this workshop, it was helpful.

Ray: my apologies for not attending yesterday. From what I saw today, this continued dialogue, there are issues pertaining to how quickly or slowly things happen. But I still detect that we are working in the same direction despite timing and process issues. There seems to be some good direction on the team and this puts us in a good position to address the next steps in the EA Process.

Adrian: I want to thank everyone for coming. It would have been good to have this session earlier but I think it was well timed to have it before the Technical Reports. I think there has been some movement on some issues and some solid activities are moving forward. I have heard that we need to improve our engagement and our communications, and we have huge shoes to fill with Octavio's departure. We will do our best. I want to ask one last time for the Parties to consider their priorities so that we can better plan how to move forward effectively. Thank you everyone for your time and patience.

Ray: we as a team can be challenged on capacity, and I just wanted to close with saying that GNWT is building capacity and look forward to moving forward.

Octavio: I want to thank everyone for the work that has been done and encourage you to keep moving forward by working together. I want to remind you of the picture that Daryl tried to paint of the community taking ownership and pride of an area - moving forward. There is a lot of potential for this remediation, so realise it!

END OF WORKSHOP: JUNE 28, 2012]

APPENDIX I - Workshop Participants

Name	Organization	Email
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Kevin O'Reilly	Alternatives North	
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*Anne Wilson	EC	*Joined via teleconference

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X Todd Slack	YKDFN	
Kevin O'Reilly	Alternatives North	
France Benoit		
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Kelly Burke	DFO	Kelly.Burke@
Mike Nahir	AANDC	
John Hull	Golder's	
Rudy Schmidtke	AECOM	
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X Rick Hurst	DPRA	
Katherine Silcock	AANDC.	
Adrienne Cartwright	DPRA	
* Anne Wilson	EC	*joined via teleconference

APPENDIX II - List of Action Items

This Appendix is a list of action items or commitments primarily, but not exclusively, attributed to the Proponent. With each action item is a brief section of the text taken directly from the Workshop report itself and a reference to the corresponding page, in order to provide some context on the issue and the nature of the response.

Action Item 1 – p.10 Underground freezing: criteria for success

Todd: you have to give us something as a starting point, there has to be some kind of design guidelines that will have relatively hard and fast rules. This is the principle question we are discussing, so this has to happen in the next month or so, so we know that the rule isn't a bad rule.

Daryl: I have to think more on this and will give you an answer.

Mike: this […a narrative of failure…] is an interesting proposition, and we will need some time to think about this.]

Action Item 2 – p.12 Priorities of Parties to the EA regarding engagement

Adrian: I have a general question about priorities for the parties – we've spent time on different aspects of the consultation and engagement, and there is good work coming out of that. Between October and now there hasn't been a lot done in terms of meeting about the FOS. I pose to you; give us some feedback on what your priorities are? Are we focussing on the correct things at the correct time?

Action Item 3 – p.13-14 Report (trade-off study)

Kevin: slide 32 – Trade-off Study, I understand that you can release some information about configurations and what works, while holding back proprietary information, but I want to know if you will be submitting this to the Review Board. I would like to see this before the Public hearing, and if this is happening in July, this would be a good way to pull all this work together. It would be helpful if this package could be put together and submitted before the Hearings. A version of the Trade-Off Study that includes considerations and steps would be appreciated.

Mike: we need to look into that and check the federal process for whether or not we can do that.

Action Item 4 – p.14 Report (wetting update)

Kevin: will the wetting update be filed with the Review Board before the Public Hearings?

Mike: yes we plan to. (I'm looking into what's required in releasing material in regard to protocols on proprietary material)

Action Item 5 – p.16 Water velocity out of diffuser ports

Morag: have you estimated the velocities coming out of the diffuser ports?

John: I don't have those with me, but we have that information and I can get that number for you. [Note that the port exit velocities of 6-10 m/s were provided by Bruce later in presentation as provided in the original response to IR AN 10.]

Action Item 6 – p.17 Report (preliminary sampling data related to diffuser)

Alan: which way do the currents flow from the diffuser?

John: one of the things that the upcoming sampling periods will incorporate is currents. We need currents, under ice samples, and water quality.

Alan: you should have preliminary sampling available for the public hearings if you're doing sampling in August.

nod of heads at the proponent table

Action Item 7 – p.18 Diffuser and effect on Ice

Todd: the YKDFN use this area all the time. We're concerned that at a later date, the project team might say, well there's thinning and there's nothing we can do about it. What is the proponent's commitment to ensuring that the ice thinning will not occur?

Mike: our commitment is to meeting our remediation objective concerning ice thinning as a result of our design.

Kevin: we are looking for a commitment that the diffuser will not cause any thinning of the ice.

Action Item 8 - p.19 Reports (sediment and fish habitat)

Todd: on the two studies Amy Sparks mentioned (sediment and fish habitat) is there an ETA on those reports?

Mike: they are part of the program; part of which is scheduled for this summer. We can get back to you on that.

Action Item 9 – p.19 City water intake

Kevin: I understood the City was looking at an area off 48th Street for water intake for potable water, you might be advised to talk to the city about their possible water intake.

John/Mike: we can check with the City to determine the location and investigate the options of including that in the study area.

Action Item 10 – p.20 Report (sampling of bay in under ice conditions)

Bruce: the first round of sampling that was done in the Bay areas was done in under-ice conditions.

Adrian: this information has not been posted yet, but it will be provided.

Action Item 11 – p.22 Report (bench–scale tests of arsenic levels)

Rudy: an evaluation was put together as part of the bench-scale testing to ensure that we could achieve a level of 0.2 and we have been working toward that.

Kevin: IR Round 2 AN 07.

Todd: can you put that evaluation on the registry? We asked for that in IR Round 1 YKDFN

Mike: I can check into that.

Action Item 12 – p.22 Sulphates in mine effluent

Kevin: are you worried that flooding of the mine will affect these levels? I have a concern about sulphates and it's not on the list, and my understanding was that sulphates coming out of the mine effluent are high.

Rudy: I will check on that.

Action Item 13 – p.24 Organization chart

Todd: we requested an [AANDC] org chart and did not receive a response.

Kevin: including location of staff is also important. We also want a both a current org chart and a hypothetical org chart for project maintenance.

Mike: we will get back to you tomorrow on that.

Action Item 14 – p.24 Report (Oversight Committee Summary)

Adrian: I was pretty sure we provided that [May 4, 2011 Oversight Committee Summary] but I will check into that. We can take this conversation off line.

Action Item 15 – p.31 Map of Baker Creek and Highway Realignment

Todd: can we please have a commitment to provide a small map that shows the Baker Creek realignment and the highway realignment and the schedule for activities?

Adrian: yes.

Action Item 16 – p.31 Cost estimates

Kevin: I want to know what your figures [cost estimates] are for Baker Creek, and you already have a rough estimate for the North Diversion, and if those are close, I think that may influence what we want to talk about at the Public Hearings. I want to see the North Diversion option on the table.

Daryl: we can use the same estimates we made for the DAR and we can make new estimates, but there is a concern about releasing a new set of estimates. We can include some of the things Alan is asking for.

Alan: I ask for this because you will need to be prepared for this to come up in the hearing. We're looking for rough numbers that help describe the amount of work in the project.

Action Item 17 – p.32; p.33- 34 Cost Estimates

Kevin: is the developer going to provide a new cost estimate for the project, including Baker Creek?

Joanna: I have a better understanding of what you're asking for, so we will go back and see what we can produce that will satisfy your needs while still working under what we are allowed to release.

Kevin: if we get the cost estimates at the Public Hearing that is not helpful. I want them before the Public Hearing please. This is something I would consider asking the Board to make a ruling on.

Joanna: Something will be provided in advance of the Public Hearing.

Action Item 18 – p.33 upstream monitoring for beaver

Alan: are you planning to periodically look upstream during your maintenance to see if there are beaver dams that could have an impact on your project?

Adrian: right now we are doing some of that, during care and maintenance there are other arms of AANDC that are dealing with this.

Mike: I agree that this makes sense. So we can have a look to see how it fits into the project and it makes sense to look at it, as it is a risk.

Action Item 19 – p.32 Report (sediment report)

Kevin: it's fine for John to say that the Sediment Report will be filed with regulators, but I want a commitment from the Proponent to file the report.

Adrian: I cannot guarantee that it will be ready before the Public Hearings, but it will be submitted to the parties and the public registry once it is complete.

Action Item 20 – p.37 Records Keeping

Octavio: the records being generated now are being stored digitally in our CDM system, so this buys us a little bit of time to develop the records you refer to. We are currently digitizing the old records and we need to make sure that everything is being stored and updated. The program as a whole has been thinking about this, and I will provide a copy of the report that discusses our thinking on records management – we will check the status of this document and it should be finalised and submitted to the Public Registry before the Hearings. It doesn't address management 1000 years into the future, but it does lay out our current thinking.

Action Item 21 – p.37 Report (risk and perpetual care in selection of options)

Daryl: I think the most honest statement about perpetual care is that a lot of groups around the world are thinking about it and there are a lot of good ideas coming from many sources. There are always lessons to be learned from other areas of thinking, but I think you want to be cautious about suggesting that the Project Team is deficient on this. For example, one of the things we considered in our frozen block studies was how do you determine failures over long timespans…Risks like this occur, and we considered these risks when looking at methodologies that will be most suitable for perpetual care. We selected an option that would best address these risks. I will look up this supporting document and provide it to the parties (it is on the registry somewhere).

Action Item 22 – p.40 City Permits

Kevin: will you be applying [to the City]? For what permits?

Adrian: we will be complying with all legislation. We spoke to the City of Yellowknife about the demolition of the Roaster and a demolition permit was not required.

Kevin: you will get any building or demolition permits the city asks you to acquire?

Adrian: yes, we will apply for any permits the City determines are required moving forward.

Action Item 23 – p.43 Possible MOU with City

Kevin: R2 AN IR 17 – talking about worst case scenarios, we asked how would an emergency situation be communicated to the public? We had this situation with Baker Creek last year and that was a communications disaster. I was getting calls from people in the community who were confused and there was mixed response to the media. The response said that AANDC communications would handle it, but I want to know if you have a MOU with the City, and if you don't you need to develop it.

Adrian: we learned a lot from what happened with Baker Creek. We do not have an MOU, but it's an interesting idea and we could look into it.

Action Item 24 – p.45 Memo on field trial design of covers

Kevin: I asked for the field trial design for the covers in the first round of IRs, and it sounds like there have been some advances in the design, so it sounds like you are moving towards selecting an option. I think it would be helpful to put that on the public registry; some sort of note about the numbers you're looking at. This will be useful information to have so we know what the design looks like and what it's setting out to achieve - just a quick memo.

Adrian: I will talk to Mike Nahir about how we can get that done for you in a timely manner. I need to talk to my team about how and when we would be able to get this out.

Action Item 25 – p.46-47 e-mail request concerning moderate concentrations of arsenic

Shannon: my question could be because of my lack of understanding. The question was about tailings oxidising, and I read that there is a low to moderate risk of seepage of arsenic. I want to know if there should be concerns about moderate concentrations of arsenic.

Adrian: We don't have the technical experts to answer this question, but if you put it in an email, I can commit to have my experts answer that email and it can go on the registry.

Action Item 26 – p.47 Announcement on closure of the registry

Todd: can you ensure that the announcement of the closure of the registry is sent out in its own separate memo, so it is not missed?

Alan: yes.

APPENDIX III - Workshop Agenda

GIANT MINE PROJECT TEAM AND PARTIES TO THE EA
PRE-TECHNICAL REPORT WORKSHOP
June 27-28 2012: 8:30 am – 4:30 pm

LOCATION OF WORKSHOP: GNWT Boardroom
Basement of Lahm Ridge Tower
Yellowknife

OBJECTIVE OF WORKSHOP:

To update all Interested Parties to the Giant Mine Project EA, prior to the technical report submission, on site work and progress since the Technical Sessions in October 2011 and IR Round II in February 2012 and IR Round III in June 2012 [note that term "IR Round III" was corrected and deleted during the workshop].

WORKSHOP ATTENDEES:

- Giant Project Team including AANDC, GNWT, PWGSC, and technical expert consultants
- Parties to the EA including DFO, EC, AN and YKDFN
- Review Board staff as observers [note that "as observers" was corrected and deleted during workshop]
- DPRA Consultants as facilitator and recorder

WORKSHOP PROCESS:

- The agenda is organized by theme and sub-theme based on the two rounds of Information Requests and the Technical Sessions held in October, 2011;
- Technical experts and other members of the Giant Mine Remediation Project Team will provide a brief update on progress and any on-site work related to the Project since the Technical Sessions;
- A period for questions and answers, and a discussion of recent results and what they mean, where there are remaining uncertainties and the process and timeline for resolving these
- Refreshment breaks and lunch breaks will be called as appropriate based on progress and the desire to complete the agenda over a period of two days; refreshments will be provided but lunch will not be served; and

- The workshop will be facilitated by DPRA - who will also be responsible for recording and preparing a summary of the workshop to become part of the Review Board public record.

AGENDA ITEMS: DAY 1

OVERVIEW **(8:30 AM – 9:30 AM)**

1. Roundtable and Introductions — All
2. Overview of the Purpose of Meeting — Hurst/Paradis and all
3. Discussion of workshop format, agenda and process — All

UPDATES and DISCUSSION by THEME and SUB-THEME

8. Updates on Underground Freezing **(9:30 AM – 12:00 PM)**

- FOS Phase 1 findings
- 3D modelling
- Lessons learned to date
- Wetting/saturation
- Update on plans for Phase 2 FOS study

Outstanding Questions and Discussion on Underground Freezing

9. Updates and Discussion on Water **(1:00 PM – 4:30 PM)**

- Diffuser
  - Ice thickness
  - Modelling
  - Sediment survey
  - Effect on habitat
- Water quality objectives
  - End-use objectives
  - BAT
  - Water Treatment
- Baker Creek
  - Analysis and Current Plans – no diversion of Baker Creek
  - Short-term risk assessment and mitigation
  - Further investigation
  - Contingency planning

Outstanding Questions and Discussion on Water

AGENDA ITEMS: DAY 2

10. Failure Modes **(8:30 AM – 9:30 AM)**

- General overview
- Will be built into preliminary design documents

Outstanding Questions on Failure Modes

11. Surface **(9:30 AM – 10:30 AM)**

- Future land use plans and involvement of partners in process
- Status of tailings cover trial
- Air quality assessment update

Outstanding Questions on Surface

12. 3M (Monitoring, Maintenance and Management) **(10:30 AM – 12:00 PM; 1:00 PM – 3:00 PM)**

- Consultation and Engagement (Follow-up on public engagement meetings of May 8-10)
- Update on EMS (including meeting previous week)
- Update on oversight
- Perpetual Care and AN/YKDFN work to date
- Future land use plans and controls
- City permits

Outstanding Questions on 3M

REMAINDER OF AGENDA **(3:00 PM – 4:30 PM)**

13. Other Agenda Items?

14. Mutual Understanding of Review Board Schedule

15. Next Steps

16. Closing Remarks