JUNE 11, 2010, MEETING MINUTES CZN-INAC-EC-DFO-PC-NBDB

Location: Yellowknife, Environment Canada Boardroom

Time: 9:00am

Attendees

NDDB: Pauline Campbell, Band Manager; Crosscurrent Associates Ltd. (CA, consultant to NB): Peter Redvers, Shauna Morgan

INAC: Darha Phillpot, Krystal Thompson, Lorraine Seale, Marc Casas

EC: Jane Fitzgerald

PC: Katherine Cumming (via phone)

DFO: Sarah Olivier

CZN: Alan Taylor, Dave Harpley

Background

CZN's Developers Assessment Report (DAR) was ruled in conformity with the Terms of Reference of the Mackenzie Valley Review Board (MVRB), in their letter of May 28, 2010. In advance of the Information Request step, and to facilitate agency review of the DAR, CZN proposed a round-table technical meeting to answer questions and obtain comments regarding possible additional data requirements. The Nahanni Butte (Nahæâ Dehé) Dene Band (NDDB) asked to participate in the meeting.

Participants agreed that CZN would take minutes, circulate them to all participants for comment, make any required revisions, and then provide the final minutes to MVRB for posting on the EA public registry.

These minutes represent a condensed version of the discussions that took place during the meeting on June 11, 2010.

Minutes:

1. Recap of June 10, 2010 meeting in Nahanni Butte

CZN provided a summary of the main issues that arose during the June 10 meeting, with expansion of some comments by CA. The community was not happy with the way the community was portrayed in the Socio-Economic Impact Assessment, their lack of involvement in the assessment, and the absence of an opportunity to review a draft before submission to the Review Board. CZN apologized to those offended by the commentary, and agreed to work more

closely with NDDB in future. There was much discussion regarding the PC-CZN-DFN Technical Committee (TC). As far as CZN is concerned, NDDB is welcome to join the TC, but this has to be resolved with DCFN. While the TC may not a suitable forum for project review during the EA process (since it only meets 3 to 4 times per year), the TC could evolve into a suitable oversight body for mine operations. As TC membership expands to include local representation (i.e. NDDB) and regulators other than Parks Canada, potential models for TC operation will be discussed further. The proposed frequency and locations of water quality and flow monitoring were explained. Discharge monitoring would be done every few hours. Zinc, and most likely other metals, will be analysed on site to facilitate rapid response to any problems that are detected. The jurisdiction of the mine access road needs to be confirmed between INAC and GNWT, and NDDB and CZN have a keen interest. Commitments made by CZN include notifying NDDB immediately in the case of any spill, and involving NDDB in the development of a Heritage Resources Protocol.

Questions:

With regard to water sampling for biological parameters related to acid rock drainage assessment, how might this be accomplished at a remore site? CZN had not considered this specific application, but for comparison, biological testing of well water is currently done within 24 hours by collecting samples immediately before an air charter leaves site for Ft Nelson, followed by commercial transit to Edmonton.

2. Site Access

INAC intends to arrange a meeting ASAP with INAC Operations and GNWT (MACA) to discuss the road jurisdiction issue. It was noted that Parks does not need to be involved with respect to the eastern section of the road. Assuming the meeting is arranged for a date prior to late August when CZN will be here for the technical sessions, CZN could participate via teleconference.

3. Questions (all) and Answers (CZN)

Where will cement be stored? Under roof in a warehouse next to the mill – not outside.

Will there be a berm around the sulphuric acid tanks, and a containment volume of at least 110% of a tank? Yes.

Waste Rock Pile drainage, how will it be measured? A collection pond at the toe will collect the drainage, and a weir on the pond outflow (to the water management system) will allow flow measurement. Will there be underflow? Any drainage not arriving in the pond at the toe is expected to find its way into the mine water collection system because of the ‘cone of depression’ in groundwater levels due to mine dewatering. How will you minimize seepage upon closure? By placing a suitable cover layer over the pile, as simulated in Appendix 22 of the DAR. What will be the footprint affect of the WRP on groundwater flow to Harrison Creek? Minimal because the WRP footprint is small compared to the size of the creek catchment.

Testing has confirmed that, while mine wastes will not be acid generating, neutral pH leaching of lead and zinc is possible.

I see that you are considering emulsions for explosives, why? It is a cost consideration because stick powder is expensive to purchase and ship into site. However, the most economic explosive is still to be determined as an emulsion plant carries a greater capital cost.

Is the Water Storage Pond water tight? We have no evidence to suggest otherwise. The pond was originally formed within the clay layer, but some have questioned whether this seal is 100% effective. To allay concerns, a new synthetic liner will be added prior to operations. Will there be leakage monitoring? The installation and monitoring of piezometers for water levels and water quality is a standard component of operating pond monitoring.

What is the contingency plan for water quality after closure with respect to the mine? The paste mix has a lower permeability so the vein and subsidiary fractures will act as the conduits, resulting in lower contact with the paste. Water quality predictions have been made, but will need to be reviewed and refined during operations.

What is the possibility of contamination of waters of Harrison Creek, for example from losses to groundwater in the camp area and ditches (there is a concern about surface water/groundwater interaction)?.Because of the mine dewatering, we expect that there will be no discharge of groundwater from the vein. Surface water in the ditches is primarily from site runoff and leakage from Harrison Creek, and is expected to be of acceptable water quality.

Could the water in the Catchment Pond be contaminated and leak to Harrison Creek? There is a small risk of this, and this pond is the final discharge to the environment. However, CZN plans to line this pond also (a decision taken subsequent to DAR submission). CZN will make their hydrogeological consultant available to answer more detailed questions on surface water/groundwater interaction topics.

Regarding health, safety and toxicity data for the various substances to be used, the DAR does not contain all of the MSDS's. CZN explained that most of the MSDS's are included in the original PDR report (in an appendix), with the remainder in the DAR.

There was discussion about the water treatment scheme and the water management and discharge plan in relation to fluctuating seasonal flows. CZN noted that the plan and seasonal flows mean that a different type of regulatory instrument is needed to gauge compliance. Instead of setting one firm number/threshold in the water license that can never be exceeded, CZN proposes thresholds that vary throughout the year according to loads and receiving water quality. The intent of the plan is to keep metal concentrations in receiving water constant, as opposed to having fixed target concentrations in discharge water irrespective of flow rate. PC asked whether CZN could provide any examples of where this different type of regulatory instrument had been implemented for other projects. CZN referred to the Draft Water and Effluent Quality Management Policy from the Land and Water Boards of the Mackenzie Valley which discusses potential revisions to permitting approaches along the lines proposed by CZN. CZN emphasized that a lack of precedent should not deter an approach that will minimize impacts.

A comment was made that it appeared that sulphate concentrations in Prairie Creek would increase significantly above background levels. CZN was asked to consider this impact in a future submission, and agreed to do so..

Is there more sediment in Prairie Creek below the mine site than above, and are there baseline sediment data? We have no indication of differing sediment quantities. Yes there are baseline data, from the ecological study initiated by the University of Saskatchewan (U of S) and INAC in 2006, and continued by U of S and Parks Canada to 2009. PC indicated that the final results of these studies will not be available for at least another 6 months, so they will not be able to feed into the EA process; only earlier results have been published in academic papers. PC indicated that the results could be provided immediately after they become available.

Has DFO identified a need for sediment sampling and effects of sediment on fish and habitat downstream? DFO has an interest in this issue, especially how sediment affects fish and fish habitat downstream and at water crossings and will be requesting additional information on mitigation measures and monitoring to reduce any potential impacts.

Will an increased volume of water sent to the treatment plant affect the efficiency or effectiveness of treatment? No, this is simply a matter of increasing reagent quantities. Treatment capacity will depend on mine flows. CZN will monitor these and expand the water treatment plant to handle greater volumes accordingly.

How long will the tailings be stored temporarily underwater in the WSP? CZN is not sure about this; it will depend on the mine development schedule and access to stopes. CZN will need at least a few years before there are stope areas ready for backfill. Any remaining tailings or sediment will be removed from the pond at closure.

We note flows will be monitored on Prairie Creek upstream of the mine. Will flows be monitored downstream? No, there is no need. Flows from the site will be monitored at the point of discharge. In any event, a single constant creek channel is required for flow monitoring. This does not exist downstream for many kilometres.

Where will you source aggregates from (the concern is aggregates should not be taken from river beds)? CZN noted that they are aware that alluvial gravels below the high water mark are ‘off-limits’. CZN will use the current site quarry for site needs, and would prefer to use screen material from above the Sundog Creek floodplain for gravel bed for the Tetcela Transfer Facility, and failing this the site quarry. CZN will be offering a contract to Nahanni Butte to source gravel for the Liard Transfer Facility, and failing this a local commercial source.

Is there potential for culverts rather than snowfill crossings along the access road? Yes, temporary culverts may be used at some crossings. These will be removed before break-up. DFO noted that should culverts be installed seasonally at crossing where fish or fish habitat may be present, CZN will need to provide additional information, including details on the methods for the seasonal installation, maintenance or removal of the culverts.

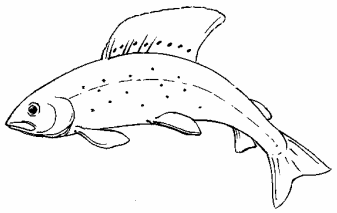
What are the specific types of crossings you will be using along the access road? CZN will be providing these details in the near future.

Should CZN intend on using DFO operational statements for any components or activities of the project, those should be clearly identified and described.

4. Future Information Requirements

DFO indicated that more data is required regarding the diffuser, such as design, anchor system, sediment considerations, flow velocities, and an assessment of potential impacts on fish and fish habitat at the location and downstream. DFO also requires those details to determine if an authorization may be required.

For the construction and maintenance of the winter road, DFO will require details regarding the proposed water sources, bathymetric survey results as well as the calculation of the total available water volume under ice of each source (an updated water withdrawal protocol for waterbodies is attached).



DFO Protocol for Winter Water Withdrawal from Ice-covered Waterbodies in the Northwest Territories and Nunavut

Rationale

In the Northwest Territories and Nunavut, winter activities such as access road construction, exploratory drilling and camp operations often require large amounts of water. Excessive amounts of water withdrawn from ice-covered waterbodies can impact fish through oxygen depletion, loss of over-wintering habitat and/or reductions in littoral habitat. The potential for such negative impacts to over-wintering fish and fish habitat has made winter water withdrawal a critical issue for Fisheries and Oceans Canada (DFO) in the Northwest Territories and Nunavut. To mitigate impacts to fish from water withdrawal from ice-covered waterbodies, and to provide standardized guidance to water users, including volume limits for certain water source types, DFO has developed this protocol in conjunction with industry and other regulators.

For the purposes of this protocol, a **waterbody** is defined as any water-filled basin that is potential fish habitat. A waterbody is defined by the ordinary high water mark of the basin, and excludes connecting watercourses.

This protocol will **not** apply to the following:

- Any waterbody that is exempted by DFO (e.g. Great Bear Lake, Great Slave Lake, Gordon Lake, and others as and when determined by DFO), and;
- Any waterbody from which less than $100m^3$ is to be withdrawn over the course of one ice-covered period.

In order to establish a winter water withdrawal limit for a given waterbody, the following criteria must be adhered to:

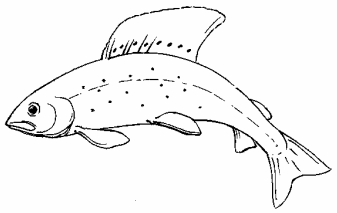
1. In one ice-covered season, total water withdrawal from a single waterbody is not to exceed 10% of the available water volume calculated using the appropriate maximum expected ice thickness provided in Table 1.
2. In cases where there are multiple users withdrawing water from a single waterbody, the total combined withdrawal volume is not to exceed 10% of the available water volume calculated using the appropriate maximum expected ice thickness provided in Table 1. Therefore, consistent and coordinated water source identification is essential.
3. Only waterbodies with maximum depths that are ≥1.5m than their corresponding maximum expected ice thickness should be considered for water withdrawal (Table 1). Waterbodies with less than 1.5m of free water beneath the maximum ice are considered to be particularly vulnerable to the effects of water withdrawal.
4. Any waterbody with a maximum expected ice thickness that is greater than, or equal to, its maximum depth (as determined from a bathymetric survey) is exempt from the 10% maximum withdrawal limit (Table 1).

To further mitigate the impacts of water withdrawal, water is to be removed from deep areas of waterbodies (>2m below the ice surface) wherever feasible, to avoid the removal of oxygenated surface waters that are critical to over-wintering fish. The littoral zone should be avoided as a water withdrawal location. Water intakes should also be properly screened with fine mesh of 2.54 mm (1/10") and have moderate intake velocities to prevent the entrainment of fish. Please refer to the *Freshwater Intake End-of-Pipe Fish Screen Guideline* (DFO, 1995) which is available upon request, or at the following internet address: www.dfo-mpo.gc.ca/Library/223669.pdf.

In order to determine the maximum water withdrawal volume from an ice-covered waterbody, and thereby conform to this protocol, the following information must be provided to DFO for review and concurrence prior to program commencement.

Water Source Identification

1. Proposed water sources, access routes, and crossing locations clearly identified on a map, with geographical coordinates (latitude/longitude and/or UTMs) included.
2. Any watercourse connectivity (permanently flowing and/or seasonal) between the proposed water source and any other waterbody or watercourse.



DFO Protocol for Winter Water Withdrawal from Ice-covered Waterbodies in the Northwest Territories and Nunavut

3. Aerial photos or satellite imagery of the water sources.
4. Estimated total water withdrawal requirement for work or activity and estimated total water withdrawal per water source (in m^3).

Bathymetric Survey Results

1. For all waterbodies: One longitudinal transect, connecting the two farthest shorelines, is to be conducted regardless of waterbody size. Note: a longitudinal transect may be straight or curved in order to accommodate the shape of a lake (see Figure 1).
2. For waterbodies equal to or less than 1 km in length: a minimum of one longitudinal transect and two perpendicular transects are to be conducted. Perpendicular transects should be evenly spaced on the longest longitudinal transect, dividing the lake into thirds (Figure 1).
3. For lakes greater than 1 km in length: a minimum of one longitudinal transect is to be conducted. Perpendicular transects (minimum of 2) should be evenly spaced on the longest longitudinal transect at maximum intervals of 500 m.
4. Additional transects should be run as required to include irregularities in waterbody shape such as fingers or bays (Figure 1).
5. All longitudinal and perpendicular transects are to be conducted using an accurate, continuous depth sounding methodology, such as open water echo sounding or ground penetrating radar (GPR), that provides a continuous depth recording from one shore to the farthest opposing shore (Figure 1). Any alternative technology should be reviewed by DFO prior to implementing for bathymetric surveys.

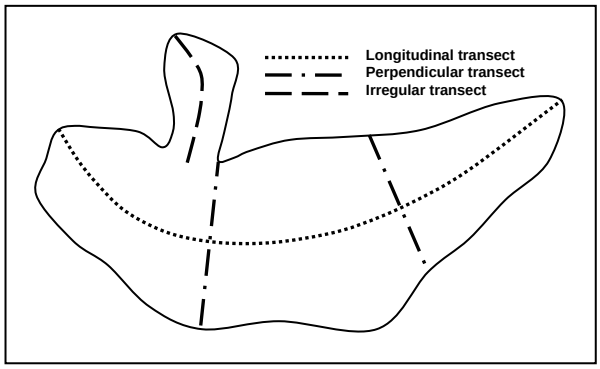


Figure 1. Minimum transect layout for a lake that is less than 1 km in length, with an irregularity.

Volume Calculations

1. Document the methods used to calculate surface area. If aerial photos or satellite imagery were used, provide the date (day/month/year) taken, as surface area may change depending on the time of year. If maps were used, provide the year that they were surveyed.
2. Detail the methods used to determine the total volume of free water, incorporating the relevant bathymetric information.
3. Calculate the available water volume under the ice using the appropriate maximum expected ice thickness, i.e. $Total\ Volume_{lake} - Ice\ Volume_{max\ thickness} = Available\ Water\ Volume$ (see Table 1 for maximum ice thickness).
4. For programs where ice-chipping is used, the total ice volume to be removed from the waterbody should be converted to total liquid volume and incorporated into the estimate of total water withdrawal requirement per water source.

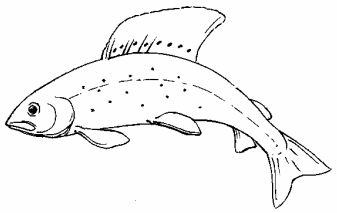


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Table 1. Maximum expected ice thickness, and corresponding water depth requirements, for different regions in the Northwest Territories.

Area	Maximum Expected Ice Thickness (m)	Minimum Waterbody depth Required for 10% Water Withdrawal (m)
Above the Tree Line	2.0	≥3.5
Below the Tree Line - North of Fort Simpson	1.5	≥3.0
Deh Cho –South of Fort Simpson	1.0	≥2.5

A brief project summary report documenting and confirming total water volume used per water source and corresponding dates should be submitted to DFO within 60 days of project completion. Information should be provided in the following format (this information would also be useful as part of the project description):

Lake ID	number and/or name
Coordinates	latitude and longitude and/or UTM coordinates
Surface area	in ha
Total Lake Volume	in m^3
Under Ice Volume	in m^3 (based on max ice thickness for region)
Max expected ice thickness value used	in m
Calculated 10% Withdrawal volume	in m^3
Total required water volume extracted	in m^3
Aerial photographs of waterbody	PDF format
Bathymetric Map(s) of waterbody	PDF format

Any requests deviating from the above must be submitted to DFO and will be addressed on a site-specific basis.

Beaver and Muskrat

Many species of animals are highly sensitive to water fluctuations. In areas where beaver and muskrat may occur, the appropriate agencies or organizations should be consulted to determine if harmful effects will result from your activities, and whether these effects can be successfully mitigated through modifications to your plans including best management practices.

Please note that adherence to this protocol does not release the proponent of the responsibility for obtaining any permits, licenses or authorizations that may be required.

For more information contact DFO at (867) 669-4915.