Fisheries and Oceans Canada presentation to:

Nunavut Water Board

Public Hearing
Amendment Application: Water Licence#3AM-GRA1015

SEASONAL REPLENISHMENT OF NIPISSAR LAKE
Hamlet of Rankin Inlet
Kivalliq Region

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Slide #2 - Overview:

Fisheries and Oceans Canada (DFO) is an interested party in the Nunavut Water Board review of the Government of Nunavut's (the Applicant) application to amend the Type 'A' Water Licence for the Hamlet of Rankin Inlet to allow for annual replenishment of Nipissar Lake. Pursuant to federal legislation, DFO ensures compliance with the Fisheries Protection Provisions of the *Fisheries Act*, specifically to manage impacts to fish and fish habitat to provide for the sustainability and ongoing productivity of the commercial, recreational and Aboriginal fisheries that are supported.

The proposed license amendment is intended to address the drawdown of Nipissar Lake, the primary water supply for Rankin Inlet, due to increasing water demand by the local population, lower than anticipated annual recharge rates to the lake, and leaks in the water supply system.

Slide #3 - DFO Determination:

DFO has considered the project assessment information as well as responses to questions posed by DFO and other reviewers. After considering the Applicant's proposed avoidance and mitigation measures, and in consideration of those measures being fully developed and effectively implemented, DFO is of the opinion that there is likely a low probability of detectable impacts to the Char River in terms of its ability to support commercial, recreational or Aboriginal fisheries. However, this determination is conditional on the implementation of effective and appropriate mitigation measures, monitoring and responsive management actions, and development of a long-term water management plan such that the sustainability of the Char River is not jeopardized.

Despite the application of mitigation and monitoring, there is still uncertainty regarding the ability of the Char River to provide the required water to maintain Nipissar Lake without endangering the aquatic resources of the river.

Slide #4 – Assessment of Mitigation

In an attempt to provide a basis for DFO's comments I have used some simplified figures taken from the various numbers that have been provided and revised regarding current water usage and projected usage. DFO understands that the annual natural recharge of Nipissar Lake is approximately 314,000 m^3 (as per the 2008 Operation & Maintenance Plan and as restated in the updated O&M Plan for 2010). The estimated use of water per year from the lake is approximately 600,000m^3, leaving a difference of approximately 286,000m^3 of water to be pumped from the Char River to the lake each year. Based on an anticipated maximum pumping rate of 0.04m^3/s or 40L/s, it is expected to take approximately 80 days of pumping from the Char River to replenish Nipissar Lake each year.

Slide #5 – Assessment of Mitigation, cont'd

DFO provided advice to the Board in December 2013 that an Authorization pursuant to the *Fisheries Act* would not be required based primarily on 4 main mitigation measures:
- a commitmet to withdraw no more than 10% of the instantaneous flow from the Char River
- a commitment to continuously monitor instantaneous river flow to ensure pumping rates do not exceed 10%
- a commitment to include a "cut-off limit", that being a water depth below which water would not be pumped from the river
- a commitment to provide an acceptable fish screen on the intake to avoid entrainment of fish

DFO notes that while these mitigation measures may be appropriate to address impacts to aquatic resources in the Char River, uncertainty due to limitations in the data available to adequately describe the flow regime, and information on how the measures will be implemented, monitored and adapted, are unclear.

Slide #6: Outstanding Concerns Regarding Proposed Mitigation Measures, and Recommendations:

- Regarding the commitment to determine daily river flows to ensure pumping rates do not exceed 10% of the instantaneous flow…

  It is not clear what is considered a pumping "day".

  While the assessment reports provided imply that the pump will be shut off each day and restarted each subsequent day following a daily flow calculation, it is noted that for proposed pumping in 2014, it was stated that "the duration of pumping will span over approximately 14 days, with the pump operating 24 hours a day".

As well, the anticipated pumping duration of approximately 80 days to replenish the 286,000m^3 of water in Nippisar Lake can only be achieved with 24hrs of pumping for the entire period.

Recommendation: Clarification be provided as to whether monitoring of instantaneous flows is continuous. As well, clarification is required as to the procedures for determining daily river flow rates and pumping rates including the timing of these calculations, and how adjustments to pumping rates will be implemented when needed.

Slide #7

- Regarding the commitment to monitor instantaneous flow to ensure the 10% withdrawal value is not exceeded, and the intention to cease pumping if a withdrawal rate of 10 % of the flow rate of the river cannot be achieved…

  This is identified as a mitigation measure to address the "potential for loss of habitat and impedance of fish movement associated with the water withdrawal activities". However, during periods of rapid decline in spring freshet flow, it is not clear how it will be ensured that pumping rates will be adjusted so as to not exceed 10% withdrawal. In particular, assessment reports indicate that "upon completion of the freshet, flow rates dropped significantly to 0.131 m^3/s" from an "average flow at the peak of the freshet [of] 7.37 m3/s".

Recommendation: Clarification be provided as to the procedure for adjusting pumping rates in response to rapidly changing river flows to ensure the 10% of instantaneous flow is not exceeded.

Slide #8

- Regarding the commitment to include a "cut-off" limit, below which pumping would cease…

  Setting a minimum water depth may not provide an additional level of protection for the fish and fish habitat function in the river.

  Data collected for the Char River in support of the Meladine Project indicate that average water depths were in the range of 0.5m to 0.3m from spring to summer, with some areas up to 1.0m in depth in the spring. It is not clear what the water depth is at the pump location nor how a .5m depth cut-off would be applied, especially if that depth is only likely to be achieved in the spring, and only in specific areas in the river.

  The assessment report references the DFO (2013) *Framework for Assessing the Ecological Flow Requirements to Support Fisheries in Canada* document which presents the "cut-off limit" not as a minimum water depth, but as a point where withdrawal would cease if the instantaneous natural flows dropped below 30% of the mean annual discharge for the river. It is unlikely that sufficient flow data for the river are available to calculate the mean annual discharge.

The Applicant should refer in more detail to the DFO "Ecological Flows Requirements" A <10% of instantaneous flow withdrawal limit is likely protective during seasonal high flow, however, a flow based cutoff, possibly in the 0.1 to 0.6 m3/s range may be required during extreme low flow events and during the typical seasonal low flows. This would be a flow level at and below which no water should be withdrawn from the Char River.

Recommendation: That the water depth at the pump location be clarified. Also given the implications of drawing down a 1.0m deep pool to 0.5m on other area of the river that may only experience a maximum depth 0.5m, the appropriateness of this criteria to manage withdrawal related impacts should be clarified. The Applicant should gain greater knowledge of the river flow regime to establish a protective limit for water taking during seasonal low flow. This may involve determining the Mean Annual Discharge with some accuracy or modeling natural flow in the Char River such that a 30% of mean annual discharge cut-off limit can be defined and compared to in-stream flow suitability measurements for important fish life-cycle requirements.

Slide #9

- Regarding the commitment to provide an acceptable fish screen on the intake to avoid entrainment of fish…

  Clarification was provided that the screen opening size would be 2.54 mm in compliance with DFO's fish screening guidelines and that the surface area of the intake was developed such that maximum velocity at the screen face did not exceed 0.16 ft/s (0.049 m/s).

Recommendation: That the Applicant ensure that all of the required design criteria (including determination of an acceptable approach velocity, the required open screen area, the type of screening material, and the suitability of the dimensions of the screen) have been considered in the design of its water intake fish screen to be in compliance with DFO's fish screen guideline and to avoid serious harm to fish.

Slide #10 – Applicant Obligations

DFO would like to remind the Applicant that they are required to demonstrate due diligence in complying with the *Fisheries Act* and it is their *Duty to Notify* DFO if they have caused, or about to cause, Serious Harm to fish. Serious Harm is defined in the *Fisheries Act* as "death of fish, or any permanent alteration or destruction of fish habitat", and applies to fish and fish habitat that are part of or support a commercial, recreational or Aboriginal fishery.

Slide #11 – Further Clarification

DFO would like to provide clarification regarding a question of potential impacts of water withdrawal on fish habitat compensation works in the Char River.

DFO can confirm that there are no fish habitat compensation works constructed, being monitored, or being planned, in the Char River. Further, there is no fish habitat compensation agreement with Agnico-Eagle that involves the Char River. Therefore DFO can confirm that a water withdrawal from the Char River would not affect an existing fish habitat compensation

agreement.

Slide #12 - Other Considerations

Based on the seasonality and short duration of high flows in the Char River, water withdrawal may only be possible during spring freshet each June. It is unlikely that sustained flows above an ecologically-derived “cut off limit” will be available to support the anticipated pumping period of 43 to 79 days from the Char River.

Slide #13 - Other Considerations

DFO notes and supports AANDC’s recommendations for:

- multi-year flow monitoring and assessment of viability of the Char River as a water source
- adaptive management for when flows in the Char River were insufficient
- a robust alternatives assessment of supplememtary water sources