September 11, 2014
File: 144901612

Attention: Damien Cote
Nunavut Water Board

Dear Mr. Cote,

Reference: Rankin Inlet Water License Amendment #3AM-GRA1015

On behalf of the Government of Nunavut's (GN's) Department of Community and Government Services (CGS), Stantec Consulting Ltd. (Stantec) has reviewed the August 27, 2014 letter from Aboriginal Affairs and Northern Development Canada (AANDC) which makes 6 recommendations to the Nunavut Water Board (NWB) concerning the Water License Amendment application #3AM-GRA1015.

In the preamble to one of its recommendations, AANDC questioned if the pumping rate had changed given that the estimated pumping period in 2030 had decreased from the initial application to the May 2014 environmental screening report.

For clarity, the pumping rate of 0.04 m^3/s has not changed. The reference to requiring 125 days of pumping in 2030 was to pump 484,029 m^3, which was based upon what was thought to be the current community water usage rate per person of 469 L/day. That usage rate was determined to be in error (see Nov. 6, 2012 letter from Stantec to the NWB) and the required volume to be pumped in 2030 was revised down to 292,730 m^3, which represents a current usage rate per person of 356 L/day. Pumping 292,730 m^3 of water at 0.04 m^3/s would require 84 days of pumping.

The 79 days of pumping for 2030 that is estimated in the May 2014 environmental screening report is based upon a targeted 2030 water usage rate of 344 L/day (12 L/day lower than the current rate). At that rate, the water volume required to be pumped would be 271,924 m^3, which would require 79 days of pumping at 0.04 m^3/s.

We note that our estimated 2030 pumping requirement of 79 days is based upon a 2030 population estimate of 4649, which was calculated using a 3% annual population growth rate. The Nunavut Bureau of Statistics population estimate for Rankin Inlet for 2030 is lower and so the required water usage, pumping volume and pumping period could all be lower than what we have estimated using the 3% population growth rate. For example, the projected 2030 population in Rankin Inlet according to the Nunavut Bureau of Statistics is 3649, which would reduce the water required and the pumping period to approximately 43 days.

The recommendations put forward by AANDC and our responses are contained in the following table.

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Recommendation		Response
1. The licensee develop an adaptive management plan that would include:	**a. Seasonal flow monitoring of Char River for the duration of the license.**	The adaptive management plan will include Char River flow monitoring prior to and during pumping each year that the pipeline is in operation. Flow monitoring would cease at the end of the pumping period and would resume the following spring prior to pumping. The calculation of the instantaneous river flow will be achieved by conducting a hydrological assessment. This work will be done in two phases. In the fall of 2014, we will conduct a desktop exercise to develop a theoretical rating curve for the Char River immediately upstream of the pumping station. Two cross-sections and the slope of the river in between will be surveyed. In addition, photographic and geomorphologic information will be used to define the roughness characteristics of the river. Based on the cross-section and the roughness coefficient, a theoretical flow will be estimated for different river depths. The relationship between level and estimated flow will be used to derive the theoretical rating curve. In 2015, a field hydrologist will visit the project area to calibrate the rating curve with actual flow data. The flow curve, in combination with an installed staff gauge, will allow the instantaneous flow of the Char River to be calculated and monitored.
	b. Formulation of in-stream flow objectives for the Char River	CGS is proposing to limit its withdrawal to a maximum of 10% of the instantaneous flow in the Char River, in adherence to the *Framework for Assessing the Ecological Flow Requirements to Support Fisheries in*

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		Canada (DFO 2013), which states that the withdrawal of less than 10% of the instantaneous flow has a low probability of detectable impacts to aquatic ecosystems. This 10% withdrawal limit will also be accompanied by an in-stream minimum flow requirement. At this time, based upon preliminary research, we are estimating that a minimum in-stream depth of 50 cm will be protective of the environment given the fish species that could be found in the river. A more detailed and comprehensive literature review will be conducted this fall to confirm or, if needed, to adjust the 50 cm up or down based upon our research findings. This minimum depth will used to calculate the minimum in-stream flow that must be maintained. The NWB will be provided with the results of this research.
	c. Mitigation options for occurrences when flow may be insufficient to meet pumping objectives	As the flow in the river decreases, the amount of water being pumped will also be decreased by throttling back the pump to maintain compliance with the 10% withdrawal limit. As the river flow continues to decrease, pumping will be stopped at the required time to maintain the minimum in-stream flow as calculated from flow rating curve and the minimum required depth of 50 cm (or as adjusted). If low flows and adherence to the 10% maximum withdrawal limit and the in-stream flow minimum means that the seasonal pumping objective cannot be met, that does not mean that the community of Rankin Inlet is no longer being supplied with potable water. The purpose of the pipeline is to replenish the community water source when

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		sufficient flow is available in the Char River. The community will still be able to draw water from Nipissar Lake so not meeting the pumping objective in a particular season does not create any emergency situation in the community.
2. The licensee undertake multi-year seasonal flow monitoring of Char River to:	**a. assess the on-going viability of Char River in meeting community water needs**	Flow monitoring is to be conducted as described in the response to 1. a. Assessing the on-going viability of the Char River to meet the community's water needs will be a routine operational aspect of CGS fulfilling its responsibility to supply the community with potable water. Periodic monitoring of the community's water use to ensure that a sufficient supply is available is fundamental to any water supply project, not just this project.
	b. support the adaptive management of water withdrawals, including the establishment on in-stream flow objectives	CGS is proposing to limit its withdrawal to a maximum of 10% of the instantaneous flow in the Char River, in adherence to the *Framework for Assessing the Ecological Flow Requirements to Support Fisheries in Canada (DFO 2013)*, which states that the withdrawal of less than 10% of the instantaneous flow has a low probability of detectable impacts to aquatic ecosystems. This 10% withdrawal limit will also be accompanied by an in-stream minimum flow requirement. At this time, based upon preliminary research, we are estimating that a minimum in-stream depth of 50 cm will be protective of the environment given the fish species that could be found in the river. A more detailed and comprehensive literature review will be conducted this fall to confirm or, if needed, to adjust the 50 cm up or down based upon our research findings. This minimum depth will used to calculate the minimum in-stream flow that must be maintained. The NWB will be

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		provided with the results of this research.
3. The licensee conduct a more robust assessment of alternative supplementary community water sources that would:	**a. Assess watershed water balances, seasonal availability, annual flow variability, competing water uses**	While in the longer-term this might be required, it is our view that addressing this recommendation is not necessary at this time. In the short to medium-term, it is believed that there is sufficient flow in the Char River to meet the objectives of this project. Flow monitoring will be done each year prior to and during the pumping period as described in our response to 1. a. and assessing the on-going viability of the Char River to meet the community's water supply needs is an operational responsibility of CGS as described in our response to 2. a. If the river flow data and the community water use data in the short/medium-term indicates that a longer-term alternative or supplementary water supply source is required, then CGS will act in accordance with its responsibilities to the community to ensure that there is a safe and secure long-term water supply that is also protective of the natural environment.
	b. Fully capture implementation and operational costs.	
4. The licensee place erosion management structures at the pipeline low point to prevent erosion when releasing the water from the pipeline.		The pipeline drain line is located in a low-lying, relatively flat boggy area with no defined drainage route in the vicinity. The draining of the line will occur once annually. The low pressure and low volume involved are not likely to create erosion issues from water draining from the general area. To protect against erosion of the ground surface in the vicinity of the drain line though, the project will employ energy dissipation through the use of a riprap pad in the immediate area of the drain line. The area around the drain line will be inspected each year before, during and

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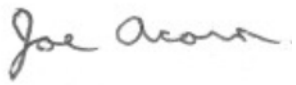
	after draining has occurred to determine if there are any signs of erosion. If erosion is detected then additional erosion mitigation methods will be employed.
5. The applicant should include the contact information for the AANDC Manager of Field Operations.	This information will be added to the Operation and Maintenance Manual and spill contingency plan.
6. Drip pans/trays or other secondary containment measures be used during any refueling operation to contain minor spills and drips.	Drip pans/trays or other secondary containment measures will be used during refueling operations to contain minor spills and drips. Please see Section 5.2 of the Operations and Maintenance Manual and Section 5.1 of the Spill Contingency Plan.

Regards,

Stantec Consulting Ltd.



Joe Acorn
Team Lead, Environmental Management
Phone: 867-920-2216 ex. 421
Fax: 867-920-2278
joe.acorn@stantec.com